

Commonwealth of Kentucky
Department of Highways

Report

on

INTERIM STATUS OF TIRE SERVICE LIFE STUDY

by

W. B. Drake
Associate Director of Research

Highway Materials Research Laboratory
Lexington, Kentucky

February, 1960



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
FRANKFORT

June 2, 1959

Ward J. Oates
COMMISSIONER OF HIGHWAYS

ADDRESS REPLY TO
DEPARTMENT OF HIGHWAYS
MATERIALS RESEARCH LABORATORY
132 GRAHAM AVENUE
LEXINGTON 29, KENTUCKY

M. 2. 7.

MEMO TO: W. A. Tincher
Director of Equipment

SUBJECT: Revised Project Proposal
Tire Service Life Study

I am transmitting, herewith, a revised proposal on the tire life study which includes some items omitted from our original proposal as well as some later additions proposed by you and Lewis Bell. As noted below, a copy of this is being sent to Mr. Bell for his further comments.

Also enclosed herewith, are 150 (134 needed) typed windshield stickers mentioned on page 4 of the proposal. Likewise, according to our estimate you might need eventually about 2,000 performance record cards; but since we were unable to get that much card stock immediately, I am sending now about 900 cards, and will deliver the remainder within a few days.

Should you find that the proposal needs to be amended further, please notify me as soon as possible.

W. B. Drake
Associate Director of Research

JHH:dl

cc: Lewis C. Bell,
Director of Purchases
A. O. Neiser

Commonwealth of Kentucky
Department of Highways
Department of Finance

TIRE SERVICE LIFE STUDY

June, 1959

Scope:

The service life of selected, most commonly used tire sizes installed on Highway Department trucks and sedans will be evaluated. Major manufacturers and other manufacturers (later defined) products will be studied to determine average service life. One half or four highway districts (1, 2, 7 and 8) will be involved in the project and the trucks used will be selected or assigned at random in these districts (The sedans used in the study will be Central Office pool vehicles). A progress record for each tire and use record for each vehicle with regular report or measurement times to be specified will be required. A cost per vehicle mile operation for the various specified brands of tires shall results.

Procedure:

<u>Vehicles</u>	<u>Number</u>	<u>Type</u>
New	30	2-ton dump trucks
	12	pick-up trucks
	10	sedans, Central Office
In Service	2	heavy duty truck tractors
	2	transport trucks, C.O.
	30	2-ton dump trucks 1957-58
	38	pick-up trucks 1957-58
	10	sedans, C.O. 1957

Tires Under Study:

Major Manufacturers

1. Firestone
2. General
3. Goodrich
4. Goodyear
5. U.S. Royal

Minor Manufacturers

1. Cooper
2. Mohawk
3. Pennsylvania

Installation Program

Each vehicle will have two brands of tires mounted with all tires on a side being one brand. Each vehicle will have minor and major brand tires. The number of tires, sizes and types will be as listed below:

(1) Tire: 11.00 x 20 - 12 ply, heavy duty truck tractors:

2 vehicles (both in service) 12 tires required

<u>Number</u>	<u>Make</u>	<u>Mounted</u>
6	Cooper	3 Rt & 3 Lt
3	General	3 Rt
3	Goodrich	3 Lt
<hr/>		
12 tires - 11.0 x 20 - 12 ply		

(2) Tire: 10.00 x 20 - 12 ply, transport trucks:

2 vehicles (both in service) 20 tires required

<u>Number</u>	<u>Make</u>	<u>Mounted</u>
5	Mohawk	5 Rt
5	Cooper	5 Lt
5	Firestone	5 Rt
5	U.S. Royal	5 Lt
<hr/>		
20 tires - 10.0 x 20 - 12 ply.		

(3) Tire: 8.25 x 20 - 10 ply, 2-ton dump truck:

60 vehicles (30 new, 30 in service) 360 tires required

<u>Number</u>	<u>Make</u>	<u>Mounted</u>	<u>Required</u>
60	Cooper	30 Rt & 30 Lt	1/2 on new
60	Mohawk	30 Rt & 30 Lt	1/2 on new
60	Pennsylvania	30 Rt & 30 Lt	1/2 on new
36	Firestone	18 Rt & 18 Lt	1/2 on new
36	General	18 Rt & 18 Lt	1/2 on new
36	Goodrich	18 Rt & 18 Lt	1/2 on new
36	Goodyear	18 Rt & 18 Lt	1/2 on new
<u>36</u>	U.S. Royal	18 Rt & 18 Lt	1/2 on new

360 tires - 8.25 x 20 - 10 ply

(4) Tire: 6.50 x 16 - 6 ply, pick-up trucks:

50 trucks (12 new, 38 in service) 200 tires required

<u>Number</u>	<u>Make</u>	<u>Mounted</u>	<u>Required</u>
52	Cooper	26 Rt & 26 Lt	6 on new
48	Mohawk	24 Rt & 24 Lt	6 on new
20	Firestone	10 Rt & 10 Lt	2 on new
20	General	10 Rt & 10 Lt	4 on new
20	Goodrich	10 Rt & 10 Lt	2 on new
20	Goodyear	10 Rt & 10 Lt	2 on new
<u>20</u>	U.S. Royal	10 Rt & 10 Lt	2 on new

200 tires - 6.50 x 16 - 6 ply

(5) Tire: 7.50 x 14 - 4 ply, sedans

20 sedans (10 new and 10 in service) 80 tires

<u>Number</u>	<u>Make</u>	<u>Mounted</u>	<u>Required</u>
40	Cooper	20 Rt & 20 Lt	20 on new
8	Firestone	4 Rt & 4 Lt	4 on new
8	General	4 Rt & 4 Lt	4 on new
8	Goodrich	4 Rt & 4 Lt	4 on new
8	Goodyear	4 Rt & 4 Lt	4 on new
<u>8</u>	U.S. Royal	4 Rt & 4 Lt	4 on new

80 tires - 7.50 x 14 - 4 ply

When new and in service vehicles are involved, the distribution of left side and right side installations for each type vehicle should be as near equal as possible. It should be noted that for the pick-up trucks, on 4 new installations the side for selection should be at random.

Tires on new vehicles will be installed at the Central Garage in Frankfort. Tires are to be mounted with serial numbers visible toward the outside of vehicle. On dual-tired wheels the serial number on the inside tire is to be placed as near adjacent to companion number on outside wheel and facing it so it can be identified from underneath the vehicle.

Each vehicle equipped with tires under test shall have mounted in the lower right side of windshield a sticker with the following notation:

"Tires on this vehicle are under test.
Report any tire or speedometer failures
to the Equipment Superintendent."

Service Record

Individual tire record forms shall be prepared in triplicate. The equipment superintendent shall maintain the information required on the cards in each vehicle and a duplicate set to be available in his office. The third record card will be located in the Central Office of the Division of Equipment.

The average depth of tread as measured from 3 locations selected at random on the tire shall be recorded immediately after installation on the vehicle and at least one time per month until the tire is removed from service. More frequent readings may be made

if the equipment superintendent thinks they are necessary. Vehicle mileage will be recorded at least once a month and at any time the depth of tread is recorded. Mileage should be recorded at the time any tire failure is noted.

The use of the vehicle and surface type of roadway over which the vehicle is operating should be recorded on the forms so that a record of the type of service and miles involved may be maintained.

Tires will remain on vehicle as installed until they are removed because of normal replacement procedure or by premature failure. All tires will be returned to the Central Garage in Frankfort for evaluation.

Cards for keeping service records are being prepared and will be available shortly.

Analysis

It is proposed that the Division of Research will analyze the data as collected by the Division of Equipment. Preliminary reports on progress may be made based upon partial service life behavior if needed. It may be possible to evaluate the various sizes of tires separately, particularly since the reported service life as measured from mileage varies with tire sizes. It has been reported that the 7.50 x 14 tires are averaging 12,000 miles on a nation-wide survey.



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
FRANKFORT

EARLE C. CLEMENTS
COMMISSIONER OF HIGHWAYS

January 6, 1960

ADDRESS REPLY TO
DEPARTMENT OF HIGHWAYS
MATERIALS RESEARCH LABORATORY
132 GRAHAM AVENUE
LEXINGTON 29, KENTUCKY

M. 2. 7.

Dr. Lewis C. Bell, Director
Division of Purchases
Department of Finance
Frankfort, Kentucky

Subject: Interim Status of Tire Service Life Study

Dear Dr. Bell:

Following our talk on the phone, December 29, we examined the service records accumulated thus far by our Equipment Division in connection with the Tire Service Life Study and have extracted average rates of wear with respect to so-called major and minor brands of tires in service on the various types of vehicles. These data as well as the corresponding accumulated service mileage for each tire group and the number of casualties therein are summarized in the attached tabulation. While it appears from the accumulated mileages that the test may have progressed as far as 25% of its anticipated duration in some categories, it is much too early to discern any really significant divergent trends in comparative performances. Thus far, therefore, performances appear to have been more-or-less equal.

The testing program was implemented in a good order and, with minor exceptions, in accordance with our revised proposal transmitted to you under the date of June 2, 1959. Most of the tires were put into service by the end of September, 1959, and this interim status report includes some data collected through the middle of December. At the present rate of accumulating mileage, it might be expected that terminal statistics will be available next August or September. Should any further questions arise in the meantime, please call on us.

Very truly yours,


W. B. Drake

Associate Director of Research

JHH:d1
Enc.

cc: A. O. Neiser
Assistant State Hwy. Engr.
W. A. Tincher, Director of Equipment
Department of Highways

Tire Service Life Study Summary (January 4, 1960)

Tire-Size Group	No. Tires in Test		No. & Type of Vehicles	Avg. Miles per 1/32" Wear		Avg. Accum. Mileage per Tire in Group	Casualties*		Total No. Replaced
	Major Brands	Minor Brands		Major Brands	Minor Brands		Major Brands	Minor Brands	
11.00x20 (12 ply)	3	3	Truck Tractor 1	1,339	1,582	5802	-	-	0
10.00x20 (12 ply)	10	10	Tractor Trailer 2	1,549	1,436	7435	-	-	1
8.25x20 (10 ply)	182	180	Dump Trucks 60	1,869	1,908	5814	2	1	8
6.50x16 (6 ply)	100	100	Pickup Trucks 50	1,860	2,437	5146	-	-	0
7.50x14 (4 ply)	41	41	Sedans 20	1,668	1,763	8141	1	3	11

Total vehicle mileage accumulated in all groups - 789,629

* Filures (attributed to material, design or construction of tire)

$\frac{1}{32}$



How many $\frac{1}{32}$

Passenger cars ave $\frac{11}{32}$

truck $\frac{17}{13}$

1700
1210

12
9
51
3