December 1949 - Columbus 1952

Bone - Lausche - Interregional Council on Highway Transportation

Purpose of test limited

- Not to teach engineers how to build roads
- Not to decide what load roads should be built for.
- These are purposes of other tests - Idaho & Illinois - many sections - both types

- Sole purpose to test effect of various axle loads on a typical pavement in the region.

Why this purpose?

- For years axle loads had been increasing
- In early thirties only 5 to 10 in 1000 over 18000 pounds
- In 1949 from 80 to 100 in 1000
- Increase during war continued after

- Increased maintenance cost
- General observations of damage - nature
- Design of roads much the same throughout region
- Different legal axle loads
- Whatever loads legal truckers wanted higher
- What loads cause what damage ?
- Answer necessary to decision on legal load.

- To find that answer was only purpose of test.

IV Eleven States and D.C.

V Highway Research Board

VI U.S 301 south of La Plata

VII Concrete 9-7-9 9-7-9

Reinforced Concrete [illegible]
[illegible] [illegible] [illegible]

- Built 1941 - 9 years old at time of test June 1950
- Previous traffic - loads over 18,000 pounds probably rare

- But 9 years of weather - truckers claim
- Stress good condition. few cracks - mud jacked settled areas
- Subgrade - mistake - fortunate mistake - road more typical - subgrade typical of predominant soil of humid region east of Mississippi

VIII Attitude of truckers - then and later - confidence - complaint Represented on Advisory Committee. Did not contribute

IX Manufacturers and
Petroleum Industry -
Contributors - also represented

MOTION PICTURE

X Not a test of design
but a test of the
Relative effect of
Various Axle Loads on a
Typical Pavement -
Objective - Desirable
Regulatory Limits

XI Since test runs

- 6000 test on 1400 soil samples
- Analysis of 12000 strain and deflection measurements
- These occupy space in Report Publication 227 of Highway Research Board.

XII Criticism - Attacks road and conduct of test

- Ignores good before condition
- Ignores Relativity of Effect under like condition
- For instance recent trade comment after publication of Report.-

Highway Engineers will find the answer in the road itself.

XIII Criticism in Detail

1. Cross Section of Pavement
   - trapped water

2. Transverse Distribution
   - relativity

3. Frequency of load application -
   - 2 Singles 1300/day
   - 2 Tandems 900/day Ave.
   - Erroneous Year comparison
   - Matched on important roads

4. South End shorter than North End
   - Answer: Cracks per Slab

~~X/M~~

5. Maintenance -

- During Test $2,750
at rate of $5,000
per mile per year

- Why no undersealing

- Truckers say sand
quote - "so road
would crack" -
Half Truth

6. Road Location and
Drainage

- Wet area in
north end

- Refer to Model

XIV Subgrade

- Original Belief
- Corrected by early soil tests
- Before trenches were dug Trackers said it was muck
- Not uniform - longitudinal variation - transverse similarity.
- Discuss with model Relativity.

Lane	A-1	A-2-4	A-4	A-6	A-7-6
1	27	2	4	56	11
2	25	6	4	54	11
3	0	0	14	68	18
4	0	0	14	65	21

XV Cracks before Test

- Model

Lane	Feet	No. of Slabs
1	31.6	7
2	71.5	9
3	30.0	2
4	62.0	9

VI Cracks after Test

- Model

	Lane	% Slabs	Feet	Ratio
238000 Applications	1	58	196	1:6.4
	2	26	1269	
146,332 92,166 Oct 13	3	27	302	12.3
	4	96	3,704	

- Dates of Cracking in Slabs 91-93
July 19 - Sept. 19

- Longitudinal Cracks in Lane 4

XVII Cracks on A-6 Soil - Per 40' Slab

October 13

Lane	Ft./Slab		Applications
1	None		152,876
2	13		146,332
3	4	1:12.5	92,363
4	50	1:12.5	92,166

December 23

Lane		Ft/Slab		Application
1		4	1:7	238,231
2	1:3.75	28	1:7	238,263
3		15		164,523
4		Discontinued Oct. 13		

- No cracks in Lane 1 when Lane 4 was finished - Same kind of soil.

VIII Explanation of Relative Effects of 18000# Single and 32,000# tandem. Cracking Ratio at least 4 to 1 against tandem.

- Equal stress
- Different deflection
- 32,000# O.K. practically

XIX Attribute Cracking to Pumping

- No cracking on A-1 and A-2-4 soils
- Tandems caused relatively greater edge pumping - Hence longitudinal cracks in Lane 4.

XX Effect of Speed

Average Stress 20% less at 40 MPH than at Creep (2 MPH) Thin Ice

XXI Effect of Lateral Placement

Average stress 50% less at 30" than at 6"

XII Effect of Faulting

Less stress at both 40 and Creep speed

XIII Emphasize Pumping and Good Performance of Granular Soils

- Even heavier loads did not cause damaging stress

XIV This condition not general

Pumping soils predominate

Material for Regulation

Stop Where You Are