B.P.R. Project on Correlation of Truck Traffic and Pavement Conditions

Kentucky Highway Materials Research Laboratory
Locations for the Test Sections within the Control Sections and as close as possible to the Loadometer Stations established by the Division of Planning have been selected and are described in this report. With but one or two exceptions, there is reasonable certainty that these sections of pavement can be kept in service without major changes for a period of five years. However, there are repairs that should be made on the pavements in two of the sections in order to prevent rapid deterioration that is likely to occur if these are not corrected at the beginning of the study.

In selecting the locations, preference was given to pavement condition first, general uniformity of subgrade soils was second, sight distance (for protection of crew members working on the sections later) was given third consideration, and proximity to the Loadometer Station was considered last. Uniformity of design and construction features were incidental since in every case there was no reason for this to have been changed within the length of the pavement that fitted the other requirements. In several instances it was not possible to identify the station numbers at the beginning and end of the section because these were not marked. Later, when concrete markers for the end points are set, it will probably be possible to establish these stations from the plans and record them at that time.
SECTION L-27, HENDERSON-MORGANFIELD ROAD, US 60

This Section lies between the intersection of US 60 and US 41 near Henderson, and the intersection of US 60 and KY. 136 about 1.5 miles to the west. Specifically the section is as follows:

**Location** - Begin approximately 0.6 mi. west of Wilson Creek Bridge and extend westward approximately 1700 feet to the beginning of the deceleration turnout at the intersection with KY. 136.

**Surface Type & Width** - Portland Cement concrete, 18' wide (1931)

**Pavement Section** - 9"-6"-9"

**Base & Subbase** - None

Section L-27 - Looking west from beginning point which is in the foreground opposite the car.
Patched blowup at point about 425 feet west of the beginning point of Section L-27. About 30 feet of the existing pavement should be removed and replaced with a concrete patch immediately in order to eliminate this extraneous factor as an influence in the tests.
Broken concrete in the right foreground and the blowup in the middle distance should be corrected by removing about 50 feet of the existing pavement and replacing it with a concrete patch before the tests are started. This is about 825' west of the beginning point of Section I-27.

Other than the two locations pictured, this section of pavement is in good condition and if resurfacing or widening of other parts of the road from Henderson to Corydon is undertaken within a five year period, this strip of 1700 feet could be left without that treatment.
Section L-31 is entirely on the fill across the level lands northeast of Empire, as shown in the accompanying illustration. Unfortunately this photograph was taken in the rain and, therefore, gives only a general picture of the topography without any detail of the road itself.

Section L-31 looking south from Station 90/00, the north terminus of the Section.

Location: Begin approximately 1.5 miles south of the Christian-Hopkins County line at Station 90/00 and continue southward to Station 105/00.

Surface Type & Width: Portland Cement Concrete 22' wide (1940).

Pavement Section: 9"-7"-9"

Base & Subbase: None
This pavement is in excellent condition and shows no sign of distress that would indicate failure of considerable extent within five years.

SECTION L-40, FRANKFORT-SHELBIVILLE ROAD, US 60

The Section selected on the Shelbyville-Frankfort Road shows considerable distress in the form of pumping and faulted joints, despite the fact that a large number of the slabs have been realigned within the past two years by a mud-jack slurry containing cement and a bituminous material. Some of the slabs have been cracked by the faulting and pumping under heavy traffic.

In view of these circumstances, it may be that major repairs or maintenance will be required in the next five years; yet, practically all the pavement within the Control Section is in this same condition.
This Section consists of the following:

**Location:** Begin at Station 966 + 00 (approximately 0.9 mi. W. of the intersection of US 60 and KY. 395) and continue eastward to Station 981 + 00.

**Surface Type & Width:** Portland Cement Concrete, 22' wide (1942)

**Payment Section:** 9"-7"-9"

**Base & Subbase:** None

**SECTION L-41, FRANKLIN-TENNESSEE LINE ROAD US 31-W**

On the pavement containing Section L-41, all other conditions were given secondary consideration to sight distance and it may be that the Test Section will be a considerable distance from the Loadometer Station. Even so, there are no possibilities for traffic of any consequence to turn off throughout the entire stretch of road from Franklin to the Tennessee Line.

Section L-41 looking northward across Station 60 + 00 in the middle foreground and extending to Station 75 + 00 in the distance. This section includes about 100 feet of the cut but does not include the open crack in the foreground.
This pavement is slightly more than a year old, has no transverse joints (except construction joints), and has received maintenance in the form of grooving and sealing many of the cracks that formed after construction. At the time of the detailed crack survey* made on this project in November, 1949,


this Section has 15 cracks, either throughout one lane or full width. None of these was grooved, and if any were sealed at all this was done with OA-2 hot-asphalt sealer and not the cold mastic type sealer used on a number of cracks elsewhere.

For the sake of uniformity throughout the time that this study will be carried on, it is recommended that the existing cracks in this Section between Station 60 / 00 and Station 75 / 00 be grooved and filled with the mastic sealer before measurements are started.

Details of the pavement in Section L-41 are:

**Location:** Begin about 0.8 mi. north of the Tennessee State Line at Station 60 / 00 and continue northward to Station 75 / 00.

**Surface Type & Width:** Portland Cement Concrete (AE) 22' wide (1949);

**Pavement Section:** 8" uniform.

**Base & Subbase:** 1½" compacted crushed limestone insulation course.

SECTION L-45, WARSAW-CARROLLTON ROAD, US 42

The pavement in Test Section L-45 lies on the terrace deposits of the ancient Ohio River (of glacial times) when it flowed at levels much higher than those reached by the present river. For that reason, the soils have excellent internal drainage and provide outstanding subgrade support. In the accompanying picture of this section the landform is well illustrated.
and accentuated by the Warsaw Airport adjacent to the road.

Looking eastward from a point about 1.2 miles west of Warsaw over Section I-45.

There is little doubt that this pavement will withstand five years of use much heavier than that imposed on the pavement at present, even though long sections of US 42 are pumping and much of it has been resurfaced where the road does not lie on the terrace deposits. Details of the Test Section are:

**Location:** Begin approximately 1.2 mi. W. of Warsaw at the N. edge of the Warsaw Airport and continue eastward 1500 feet.

**Surface Type & Width:** Portland Cement Concrete, 20 ft wide (1931)

**Pavement Section:** 9" - 6\(\frac{1}{2}\)" - 9"

**Base & Subbase:** None
SECTION L-hh, FAIRMOUTH-LEXINGTON ROAD, US 27

Because of the general uniformity of soils and pavement construction features from Grants Lick southward for a considerable distance in Campbell and Pendleton Counties, Section L-hh was chosen mainly for sight distance and nearness to the Leadometer Station. The location selected begins about one mile south of the Leadometer Station, and is conveniently about four miles south of the trial joint installation with neoprene sealers which were placed for observational purposes when the pavement was built.

The pavement of this Test Section has a 20-foot joint interval, contains only contraction joints, and is as follows:

Location: Begin about 1 mile S. of the intersection of US 27 and KY 154 at Station 872+00, and continue northward 1500 ft. to Station 857+00.

Surface Type & Width: Portland Cement Concrete, 22' wide (1949)

Pavement Section: 5"-7"-9"

Base & Subbase: 3" compacted crushed stone insulation.

Section L-hh; looking northward from Station 872+00
SECTION L-43, GEORGETOWN-WILLIAMSTOWN ROAD, US 25

Section L-43 lies at the northern edge of the Inner Bluegrass Region, and in an area where the formations of the Inner Bluegrass begin to blend with the outliers of the Eden Shale and Cynthiana formations. In some rock cuts even farther to the south this pavement has pumped to a slight extent; however, there is no evidence of pumping in the chosen test section, undoubtedly because the soil is uniformly of the Inner Bluegrass Limestone residuum.

Except for limited sight distance farther south, this test section might have been placed nearer the Loadometer Station which presumably is within 2.5 miles of Georgetown. The details of the test section are:

**Location:** Begin at Station 180/00 (about 3.5 mi. N. of Georgetown) and continue northward to Station 195/00.

**Surface Type & Width:** Portland Cement Concrete, 20' wide (1938)

**Pavement Section:** 9"-7"-9"

**Base & Subbase:** None

Looking South on U.S. 25 from Sta. 205/00 and into Test Section L-43 which ends at Sta. 195/00. The pavement in the foreground was omitted because of the lip curbs.
Section L-4 lies entirely within the so-called Science Hill Revision of 1939, and it is the only one of the ten Test Sections in which the pavement approximates the type of flexible pavement which has been widely constructed in Kentucky for the past ten years. The water-bound base course probably closely resembles the base course used at present, but in the past few years the plant-mix has almost wholly replaced the road-mix type of bituminous surface on jobs of this nature.

Looking northward into Section L-4 which begins at the south city limits of Science Hill (Sign on right) and extends northward 1300 feet.
With the exception of one limited area about 10 feet in length in the outside wheel track of the southbound lane, there is no surface flaw which indicates that the road will not be usable as it is for five years. At that one spot — about 900 feet north of the South City Limit of Science Hill — the base failure is serious enough that it should be corrected in the best of form before the test measurements are started. The usual type of cold patch on the surface should not be used in this instance.

Specifically, this location is as follows:

**Location:** Begin at the South City Limit of Science Hill and extend 1800 feet northward.

**Surface Type & Width:** 9" waterbound macadam base and 175 lb. road mix (1939) overlain by 3/4" rock asphalt seal (1941), 20' wide.

**Pavement Section:** Uniform 11" to 11\(\frac{3}{4}\)" depth (approx.)

**Base & Subbase:** Only as noted above.
SECTION L-42, LONDON-CORBIN ROAD, US 25

Section L-42, also is located in a relatively short revision, in this case the south approach to the Robinson Creek Bridge. The section is about equally divided between cut and fill, but it is assumed that the soils placed beneath the pavement in the rock cut (see distant portion of the accompanying photograph) are about the same as those in the fill adjacent to it.

Looking south into Section L-42 which begins in the foreground and ends at the end of the concrete pavement about 1500' in the distance.
**Location:** Begin about 500' S. of the Robinson Creek Bridge and continue southward 1500' to the end of the concrete pavement (marked as Station 32+00 on the Project Marker).

**Surface Type & Width:** Portland Cement Concrete, 22' wide (1940)

**Pavement Section:** 9"-7"-9"

**Base & Subbase:** None

**SECTION L-10, MOREHEAD-OLIVE HILL ROAD, US 60**

The road on which Section L-10 is located has built up by "stage construction" beginning in 1924 when it was graded and 1925 when the first surface creek gravel was placed. This is the only one of the ten sections which "grew" in this way, yet of all the sections it has the most recently finished riding surface.

According to the records the pavement consists of:

- 7" of loose creek gravel placed in 1925 (present value given as 5")
- 1-1/8" bituminous road-mix in 1929 and 1 1/8" bituminous road-mix in 1930 (in combination reg-graded as 1 1/8" value at present).
- 1 1/8" plant-mix bituminous binder and 1/2" rock asphalt surface in 1941.
- 1 1/8" (probably) plant-mix surface course in 1950.

Hence, the total value of the pavement as given at present approximates 10", but this will be verified or modified when the pavement is cored during the field investigation.

At one point within this Section where subgrade bearing values were determined in 1948* (0.7 mi. of East City Limit of Morehead at Location 678), the

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measured thickness showed 5" of bituminous mix and 8" of gravel base. At this point the pavement had failed, as shown by one of the two accompanying photographs. The in-place subgrade density determined at that time was 107 per cent of the maximum obtained in the laboratory test, and the field C.B.R. was 6.

Location No. 678 used in the 1948 field tests for subgrade bearing values by the Research Laboratory. This location is a short distance inside Section L-10 chosen for this study. At this point a failure had occurred in the pavement as it existed at that time, but the entire section lies within a portion of the Morehead-Olive Hill Road that was widened and resurfaced in 1950.
Looking toward Morehead at a point about 0.95 east of the E.C.L. of Morehead. Section L-10 begins at the guard post on the right and extends about 0.3 mile toward Morehead.

This Section in detail is as follows:

**Location:** Begin approximately 0.95 mi. east of the E.C.L. of Morehead and extend about 0.3 mi. westward toward Morehead.

**Surface Type & Width:** Bituminous 22' wide.

**Pavement Section:** Approximately 10" uniform (surface and base).

**Base & Subbase:** Traffic Bound Gravel Base (about 5"+).