

OFFICE MEMORANDUM



MICHIGAN
STATE HIGHWAY DEPARTMENT
JOHN C. MACKIE, COMMISSIONER

March 8, 1961
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To: W. W. McLaughlin
Testing and Research Engineer

From: E. A. Finney

Subject: Cracking of Slag Aggregate Concrete on Gratiot Ave., Detroit:
Project 50-27, C4. Research Project 46 B-20. Report No. 356.

This is another summary report on cracking of the slag aggregate concrete of the southbound roadway of Gratiot Ave. between Eight Mile and Thirteen Mile Roads in Detroit. Built in 1947, with slag from Great Lakes Steel Co., Zug Island, this pavement has four 10-ft lanes, with 100-ft contraction joints and no expansion joints.

The last report on this project was made in October 1956, in Research Report No. 266, which consisted of a brief summary of pavement cracking to that date. In 1953, a more elaborate report was prepared, which included this project, slag aggregate projects on the Willow Run and Detroit Industrial Expressways, Dix Highway (US 25), and some slag aggregate pavements constructed by Wayne County.

The cracking for Gratiot Avenue is tabulated below for the years 1948, 1953, 1956, and 1960:

	1948	1953	1956	1960
Percentage of slabs cracked	25.6	84.5	95.4	97.4
Average number of cracks per slab	0.46	2.43	3.13	4.05
Lineal feet of cracking per lane mile	294	1537	1979	2548

In Fig. 1, cracking is plotted for the same years by individual lanes. Table 1 is a tabulation of these data.

OFFICE OF TESTING AND RESEARCH

E. A. Finney, Director
Research Laboratory Division

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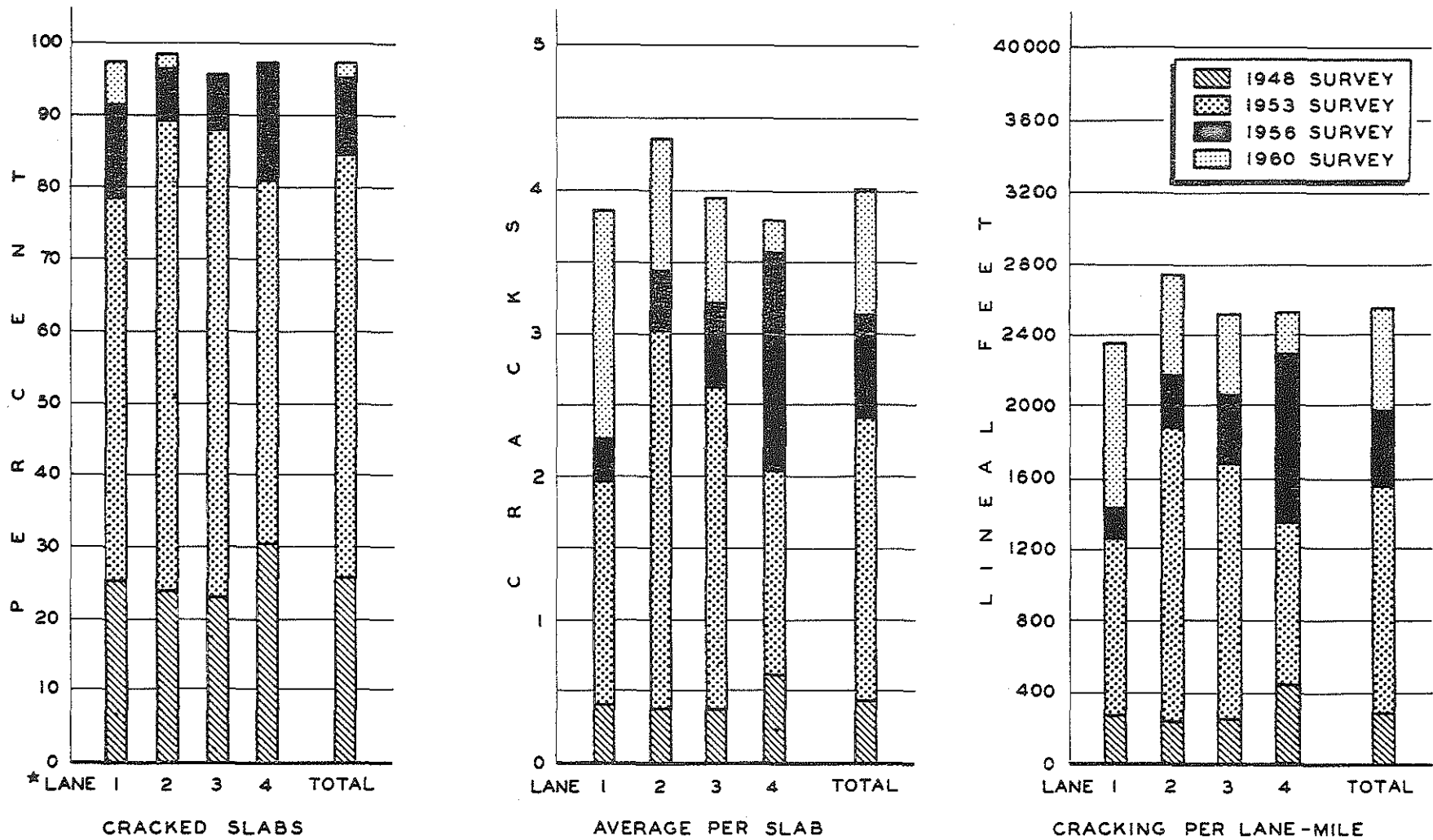
TABLE 1
SUMMARY OF CRACKING DATA
Slag Aggregate Concrete--Gratiot Ave. , Detroit

Lane*	Total Slabs	Cracked Slabs							
		1948		1953		1956		1960	
		No. Cracked	Percent Cracked	No. Cracked	Percent Cracked	No. Cracked	Percent Cracked	No. Cracked	Percent Cracked
1	252	63	25.0	199	79.0	231	91.7	246	97.6
2	252	60	23.8	225	89.3	243	96.4	248	98.4
3	256	59	23.1	226	88.3	245	95.7	245	95.7
4	256	78	30.5	208	81.3	250	97.7	250	97.7
Average		25.6		84.5		95.4		97.4	

Lane*	Total Slabs	Cracks Per Slab							
		1948		1953		1956		1960	
		Total Cracks	Avg Per Slab	Total Cracks	Avg Per Slab	Total Cracks	Avg Per Slab	Total Cracks	Avg Per Slab
1	252	115.5	0.46	498.5	1.98	568.5	2.26	974	3.87
2	252	89.5	0.36	758.5	3.01	870.5	3.45	1105	4.38
3	256	96.0	0.38	675.5	2.64	824.0	3.22	1016	3.97
4	256	171.0	0.67	537.5	2.10	917.0	3.58	1019	3.98
Average		0.46		2.43		3.13		4.05	

Lane*	Length in Miles	Cracking Per Lane-Mile							
		1948		1953		1956		1960	
		Lineal Ft Cracking	Lineal Ft Per Lane-Mi.	Lineal Ft Cracking	Lineal Ft Per Lane-Mi.	Lineal Ft Cracking	Lineal Ft Per Lane-Mi.	Lineal Ft Cracking	Lineal Ft Per Lane-Mi.
1	4.22	1210	287	5230	1240	5970	1416	10,045	2380
2	4.22	940	223	7960	1888	9140	2168	11,603	2750
3	4.22	1010	240	7090	1681	8650	2051	10,668	2528
4	4.22	1800	427	5650	1340	9630	2284	10,699	2535
Average		294		1537		1979		2548	

*10-ft lanes numbered from outer edge to median.



*10-FT LANES NUMBERED FROM OUTER EDGE TO MEDIAN

Figure 1. Cracking of slag aggregate concrete on Gratiot Avenue, Detroit: 1948-1960.