SUMMARIES OF MICHIGAN PAVEMENT SKID RESISTANCE 1974 Test Program

MDSHT REPORT NO. 249

MICHIGAN DEPARTMENT OF
STATE HIGHWAYS AND TRANSPORTATION

MDSHT REPORT NO. 249
TESTING AND RESEARCH DIVISION

SUMMARIES OF MICHIGAN PAVEMENT SKID RESISTANCE 1974 Test Program

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Research Laboratory Section
Testing and Research Division
Research Project 54 G-74
Research Report No. R-982

Michigan State Highway Commission
Peter B. Fletcher, Chairman; Charles H. Hewitt,
Vice-Chairman, Carl V. Pellonpaa, Hannes Meyers, Jr.
John P. Woodford, Director
Lansing, November 1975

LEGEND

Direction of Test Vehicle

NB, SB, EB, WB, etc. = Northbound, Southbound, etc.

Lane Tested (noted following direction of test vehicle)

RT = right turn lane
LT = left turn lane
OL = outer lane
CL = center lane
IL = inner lane
DL = deceleration lane
ML = merging lane
TL = truck lane

3 or 2 = third or second lane from centerline or median

INTRODUCTION

During the 1974 calendar year, over 12,000 skid tests were conducted throughout Michigan. These tests are summarized in this report according to the annual reporting procedure initiated in 1965. Skid levels for seven basic categories are included:

I Initial Tests on Conventional Concrete and Bituminous Pavements
II Friction Levels Determined for Pavements After Five Years of Service
III Friction Levels Determined for Pavements After Ten Years of Service
IV Experimental Features in Pavement Surfaces
V High Accident Locations
VI Special Request Tests
VII Special Attention Locations

Explanatory remarks are presented at the beginning of each category of tabulated data. All High-Accident Location tests, Special Request tests and Special Location tests have been previously reported to interested agencies within the Department.

All skid test values are expressed as 40 mph coefficients of wet sliding friction (Wsf). A Wsf value determined from a highly textured concrete pavement would be expected to be 0.60 or higher. Surfaces with coefficients of 0.20 might be as slippery as packed snow[1] and from our experience Wsf values below 0.07 will be representative of a glare ice condition.

Reference should be made to Research Report No. R-585 ("Summaries of Michigan Pavement Skid Resistance: 1965 Test Program") and Research Report No. R-747 ("MDSH Equipment for Measuring Pavement Skid Resistance," February 1971) for information regarding operation of the skid-test device, selection of test areas, and verification of retests.

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[1]Moyer, Ralph A., "A Review of the Variables Affecting Pavement Slipperiness," Proceedings of First International Skid Prevention Conference, 1959.

SECTION I

CONVENTIONAL CONCRETE AND BITUMINOUS PAVEMENTS

Initial Tests on Conventional Concrete and Bituminous Pavements

Section I summarizes skid tests representing 2357.814 lane miles of trunkline surfaces tested during 1974.

Table 1 - Concrete Pavements Constructed in 1972, 1973, and 1974

1972 Construction

Skid tests were conducted on two portland cement concrete projects (6 lanes) after a two-year service period. Friction levels ranged from 0.34 to 0.67 and averaged 0.55. Two lanes, representing 78 percent of the 11.56 lane miles, yielded average friction levels below 0.40.

1973 Construction

Seventeen projects (56.824 lane miles) of concrete pavement were skid tested after a one-year service period. Coefficients ranged from 0.28 to 0.72 and averaged 0.54. Average Wsf values on eight of the 56 lanes tested, 33 percent of the lane miles, were below 0.40. One lane or 2 percent of the lane mileage was below 0.30.

1974 Construction

Skid tests were conducted on 11 projects (46 lanes) during their initial service year. Friction levels ranged from 0.34 to 0.78 and averaged 0.55. Eight percent, 6.882 of the 87.686 lane miles, yielded average friction levels lower than 0.40. Outstanding Wsf values were encountered on Project 03035-00024, located on I 196 from 144th Ave northeasterly to a point 1,100 ft southwest of the Ottawa County line, where coefficients ranged from 0.69 to 0.78 and averaged 0.73.

Table 2 - Bituminous Concrete (4.12) Constructed in 1971, 1972, 1973, and 1974

1971 Construction

One project, 9.32 lane miles, was tested after three years of service. Coefficients ranged from 0.38 to 0.43 and averaged 0.40 for the two lanes.

1972 Construction

Skid tests were conducted on one project after a two-year service period. Friction levels on the 6.24 lane miles ranged from 0.31 to 0.42 and

averaged 0.36. All six lanes tested had average friction levels of 0.40 or lower.

1973 Construction

In 1974, 51 bituminous concrete projects, involving 202 lanes, were skid tested after a one-year service period. Friction levels on the 528.468 lane miles tested ranged from 0.25 to 0.69 and averaged 0.46. Twenty percent of the total lane mileage yielded average Wsf values below 0.40. One percent, confined to all lanes of two projects, had average friction levels lower than 0.30. These two projects were: 24011-03949, located on US 31 from Liberty St westerly and southerly to US 131 in Petoskey and 78011-04785, located on US 12 from M 103 easterly to Mann Rd (Control Section 78021).

1974 Construction

Initial service year tests were conducted on 45 projects (173 lanes). Friction levels ranged from 0.18 to 0.69 and averaged 0.45. Fourteen percent of the 690.986 lane miles yielded average Wsf values lower than 0.40. Seven lanes, representing 2 percent of the total lane mileage had average coefficients lower than 0.30. The westbound lane of Project 70041-06085 averaged 0.19. This 3.4 mile long project is located west of Grand Rapids on M 45 from 52nd Ave east to a point east of 26th Ave.

Table 3 - Bituminous Aggregate (4.11) Constructed in 1973 and 1974

1973 Construction

After a one-year service period, 35 bituminous aggregate projects, with a total of 474.938 lane miles, were tested. Coefficients ranged from 0.21 to 0.76 and averaged 0.51. Only one of the 82 lanes tested exhibited a Wsf value averaging lower than 0.40.

1974 Construction

Nineteen projects (44 lanes) were tested during their initial service year. Coefficients ranged from 0.22 to 0.64 and averaged 0.45. Twenty percent of the 468.772 lane miles tested, yielded average Wsf values lower than 0.40. The project exhibiting the lowest coefficients was 80071-06144, located on M 40 from 41 ft north of VanBuren St in Gobles northerly to 40 ft south of the VanBuren-Allegan County line. Average Wsf values on both lanes of this project were 0.30.

Table 4 - Miscellaneous Bituminous Surfaces Constructed in 1972

1972 Construction

Only one project, involving four lanes, was tested during the 1974 test year under this category. Project 2 SC-6D, skid tested after a two-year service period, yielded outstanding friction levels which ranged from 0.55 to 0.78 and averaged 0.67 for the 23.020 lane miles tested. Surface type on this project was single seal.

TABLE 1
CONCRETE PAVEMENTS CONSTRUCTED IN 1972, 1973, AND 1974

	Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
				Coarse	Fine		Low	High	Avg
1972	I 25132-03883A	I 475 from S of 12th St N'ly to N of Court St	Sargent Contracting Co.	Pit 63-54	Pit 63-54	NBOL	0.64	0.65	0.64
						NBIL	0.62	0.66	0.64
						SBOL	0.64	0.67	0.65
						SBIL	0.64	0.64	0.64
	I 82191-01326A	I 75 from 0.25 mi N of Gibralter Rd N'ly to Sibley Rd (widening)	Denton Construction Co.	Pit 63-48 & E. C. Levy (Dix & Trenton yd)	Pit 81-57 & 82-10	NBOL	0.35	0.38	0.37
						SBOL	0.34	0.38	0.36
1973	U 11031-00100A[1] (part)	M 139 relocation from N end of Ox Creek bridge N'ly to Main St	John G. Yerington Construction Co.	E. C. Levy, Burns Harbor, Ind.	Pit 11-75	NBOL	0.40	0.44	0.42
						NBCL	0.40	0.42	0.41
						NBIL	0.41	0.44	0.43
						SBOL	0.28	0.31	0.29
						SBIL	0.31	0.36	0.33
	I 19043-01930A	Proposed I 69 and US 127 from US 27 E'ly and S'ly to N of State Rd	Holloway Construction Co.	Pit 19-18	Pit 19-4	NBOL	0.54	0.57	0.55
						NBIL	0.49	0.54	0.52
						SBOL	0.55	0.60	0.58
						SBIL	0.57	0.61	0.59
	I 25032-04990A	I 75 from 1,375 ft S of M 57 N to Genesee-Saginaw Co. Line (widening)	L. W. Edison Co.	Pit 75-5	Pit 25-8 & 63-54	NBIL	0.59	0.61	0.60
						SBIL	0.64	0.67	0.66
	I 25132-03077A	I 475 from Maple Rd N'ly to S of 12th St, Flint	Sargent Contracting Co.	Pit 71-47	Pit 63-54	NBOL	0.54	0.57	0.56
						NBCL	0.57	0.62	0.60
						NBIL	0.69	0.70	0.69
						SBOL	0.57	0.61	0.59
						SBCL	0.54	0.57	0.56
						SBIL	0.60	0.61	0.60
	I 25132-03577A	I 475 from Saginaw St W'ly to Clio Rd	Chas. J. Rogers, Inc.	Pit 63-4 & 63-54	Pit 47-3 & 63-54	NBOL	0.45	0.48	0.46
						NBIL	0.67	0.70	0.69
						SBOL	0.46	0.50	0.48
						SBIL	0.59	0.61	0.60
	U 33172-00494A	US 127 from 700 ft S of Saginaw St N'ly to Clinton Co. Line	Davco, Inc.	Pit 19-18, 13-84 & 30-35	Pit 19-4 & 19-24	NBOL	0.55	0.60	0.58
						NBIL	0.70	0.72	0.71
						SBOL	0.56	0.60	0.57
						SBIL	0.68	0.70	0.69
	U 52042-03817A	US 41 from 544 ft N of Jackson St SE'ly to 300 ft SE of Carp River Hill Rd	Bacco Construction Co.	Pit 52-39	Pit 52-9	EBOL	0.47	0.52	0.49
						EBIL	0.36	0.40	0.38
						WBOL	0.35	0.36	0.36
						WBIL	0.49	0.54	0.52

TABLE 1 (Cont.)
CONCRETE PAVEMENTS CONSTRUCTED IN 1972, 1973, AND 1974

	Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
				Coarse	Fine		Low	High	Avg
1973 CONT.	I 58152-04472A	I 75 from 0.689 mi S of Newport Rd N'ly to 0.028 mi N of Wayne Co. Line (widening)	L. W. Edison Co.	France Stone, Waterville, Ohio	Pit 82-18	NBOL	0.36	0.41	0.39
						SBOL	0.41	0.45	0.43
	F 59012-03694A	US 131 relocation from 0.65 mi S of Kent-Montcalm Co. Line N'ly to 0.5 mi N of Cannonsville Rd	Eisenhour Construction Co.	Pit 54-22	Pit 54-22	NBOL	0.47	0.51	0.50
						NBIL	0.67	0.71	0.69
						SBOL	0.51	0.55	0.52
						SBIL	0.61	0.64	0.62
	F 59012-03696A	US 131 from N of M 46 N to Edgar Rd	Eisenhour Construction Co.	Pit 41-38	Pit 41-38	NBOL	0.51	0.56	0.54
						NBIL	0.68	0.71	0.70
						SBOL	0.59	0.62	0.60
						SBIL	0.68	0.70	0.69
	MU 63517-04988A	Southfield Rd from US 10 N'ly to 10 Mile Rd (widening)	Tony Angelo Cement Construction Co.	E. C. Levy (Dix yd)	Pit 63-56	NBOL	0.47	0.50	0.48
						SBOL	0.44	0.46	0.45
	F 65032-00935A	M 55 and M 76 from I 75 E'ly to WCL West Branch	W. F. McNally Co.	Pit 65-7	Pit 65-7	EB	0.35	0.37	0.36
						WB	0.28	0.32	0.31
	I 65041-00947A	I 75 from 0.42 mi E of Ski Park Rd NW'ly to Roscommon-Ogemaw Co. Line	Daveo, Inc.	Pit 65-7	Pit 65-7	NBOL	0.50	0.56	0.53
						NBCL	0.44	0.48	0.46
						NBIL	0.53	0.57	0.55
						SBOL	0.38	0.40	0.39
						SBIL	0.48	0.49	0.49
	I 70024-00986A	I 196 from E of 32nd St NE'ly to Kenowa Rd	Kamminga and Roodvoets, Inc. and Denton Construction Co.	Pit 41-16	Pit 70-45	NBOL	0.70	0.72	0.71
						NBIL	0.68	0.70	0.69
						SBOL	0.59	0.64	0.62
						SBIL	0.66	0.71	0.69
	FI 73171-04691A	I 75 from Genesee-Saginaw Co. Line N'ly to 2,700 ft N of M 54 and M 83 (widening)	L. W. Edison Co.	Pit 75-5	Pit 25-8 & 63-54	NBIL	0.56	0.59	0.58
						SBIL	0.55	0.59	0.57
	SU 82191-02801A I 82191-02802A (widening)	I 75 at Gibralter Rd	Denton Construction Co.	E. C. Levy, Trenton yd	Pit 63-55	NBOL	0.48	0.51	0.50
						SBOL	0.43	0.46	0.44
1974	I 03035-00024A	I 196 from 144th Ave NE'ly to 1,100 ft SW of Ottawa Co. Line	Carl Goodwin and Sons, Inc.	Pit 70-9 & 75-5	Pit 70-9 & 70-39	NBOL	0.70	0.74	0.72
						NBIL	0.72	0.78	0.74
						SBOL	0.74	0.76	0.75
						SBIL	0.69	0.73	0.71
	M 11051-05491A[1] (Part)	US 31 and US 33 from Fort St N'ly to M 60 BR	Titus Construction Co.	Material Service, Thornton, Ill.	Pit 14-36	NBOL	0.37	0.39	0.38
						NB#3	0.47	0.50	0.49
						NB#2	0.38	0.41	0.40
						NBIL	0.36	0.37	0.36
						SBOL	0.35	0.38	0.37
						SBIL	0.38	0.41	0.40

TABLE 1 (Cont.)
CONCRETE PAVEMENTS CONSTRUCTED IN 1972, 1973, AND 1974

1974 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
F 19081-00250A	US 127 from Ingham-Clinton Co. Line N'ly to N of State Rd	Eisenhour Construction Co.	Pit 19-18 & 19-24	Pit 19-4	NBOL	0.55	0.58	0.56
					NBIL	0.59	0.62	0.60
					SBOL	0.52	0.57	0.55
					SBIL	0.53	0.58	0.56
I 41029-00574A	I 196 from 277 ft SW of Ottawa-Kent Co. Line N'ly to 1,455 ft N of M 21	Daveo, Inc.	Pit 41-16	Pit 70-45	NBOL	0.62	0.66	0.64
					NBIL	0.68	0.71	0.69
					SBOL	0.59	0.61	0.60
					SBIL	0.58	0.62	0.60
I 50061-06522A	11 Mile Rd from Audrey St (W of Mound Rd) E'ly to W of the Penn Central RR	Ministrelli Construction Co., Inc.	E.C. Levy (Dix yd)	Pit 50-41	EBOL	0.44	0.51	0.48
					EBIL	0.44	0.52	0.48
					WBOL	0.52	0.53	0.53
					WBIL	0.46	0.52	0.49
MI 63525-05505A	M 150 from M 59 relocation N'ly to 486 ft N of Hamlin Rd	The Cooke Contracting Co.	E.C. Levy (Dix yd)	Pit 63-54	NBOL	0.40	0.42	0.41
					NBIL	0.38	0.43	0.40
					SBOL	0.40	0.46	0.44
					SBIL	0.50	0.53	0.52
I 70024-00983A	I 196 from approximately 3,200 ft S of Byron Rd NE'ly to approximately 300 ft E of 56th Ave	Carl Goodwin and Sons, Inc.	Pit 70-9 & 75-5	Pit 70-27 & 70-39	NBOL	0.58	0.62	0.60
					NBIL	0.64	0.68	0.66
					SBOL	0.65	0.69	0.67
					SBIL	0.64	0.68	0.65
I 70024-00984A	I 196 from S of Ottawa-Allegan Co. Line NE'ly to S of Byron Rd	Carl Goodwin and Sons, Inc.	Pit 70-9 & 75-5	Pit 70-9 & 70-39	NBOL	0.67	0.72	0.69
					NBIL	0.63	0.68	0.66
					SBOL	0.62	0.67	0.65
					SBIL	0.57	0.60	0.58
I 70024-00985A	I 196 from 300 ft E of 56th Ave NE'ly to E of 32nd St	L. W. Edison Co.	Pit 41-16	Pit 70-45	NBOL	0.59	0.64	0.61
					NBIL	0.68	0.70	0.69
					SBOL	0.56	0.61	0.59
					SBIL	0.57	0.59	0.58
M 82081-03107A	M 153 from 750 ft W of Beech-Daly Rd E'ly to 1,030 ft W of NB US 24 (Telegraph)	Chas. J. Rogers, Inc.	Pit 71-47	Pit 63-9	EBOL	0.36	0.41	0.38
					EBCL	0.35	0.39	0.37
					EBIL	0.48	0.51	0.49
					WBOL	0.34	0.36	0.35
					WBCL	0.40	0.43	0.41
					WBIL	0.53	0.56	0.54
I 82191-02800A	I 75 from Huron River NE'ly to Gibralter Rd interchange (widening)	John Carlo, Inc.	E.C. Levy, Trenton yd	Pit 63-55 & 81-57	NBOL	0.51	0.53	0.52
					SBOL	0.51	0.55	0.53

[1] See Table 2 for additional data.

TABLE 2
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

	Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
				Coarse	Fine		Low	High	Avg
1971	Mb 34061-01723A	M 21 from W of Turkey Trail E to E of M 66 S	Reith-Riley Construction Co., Inc.	Pit 41-46	Pit 41-69	EB WB	0.38 0.42	0.39 0.43	0.38 0.42
1972	Mb 82061-03988A	US 12 from Wiethoff St in Inkster E'ly to W of Gulley Rd in Dearborn Heights	Chas. J. Rogers, Inc.	E.C. Levy, Dix yd	E.C. Levy, Dix yd	EBOL EBCL EBIL WBOL WBCL WBIL	0.34 0.33 0.36 0.31 0.31 0.37	0.37 0.36 0.39 0.36 0.36 0.42	0.36 0.34 0.38 0.33 0.34 0.40
1973	Mbr 04021-04956A (part)	M 32 from US 23 W'ly to 11th Ave in Alpena	Alpena Paving Co., Inc.	Pit 71-15	Pit 71-15	EB WB	0.37 0.35	0.40 0.41	0.39 0.39
	Mbr 04021-04956A (part)	M 65 from M 32 N'ly 0.94 mi	Alpena Paving Co., Inc.	Pit 71-15	Pit 71-15	NB SB	0.50 0.53	0.53 0.56	0.51 0.54
	Mbr 04021-04956A (part)	US 23 from Grant St N to Chisholm St	Alpena Paving Co., Inc.	Pit 71-15	Pit 71-15	NB SB	0.34 0.36	0.36 0.40	0.35 0.39
	U 11031-00100A[1] (Part)	M 139 relocation from N end of Ox Creek bridge N'ly to Main St	John G. Yerington Construction Co.	Pit 39-1	Pit 11-75	SBOL SBCL SBIL	0.33 0.41 0.48	0.37 0.43 0.50	0.36 0.42 0.49
	Mb 11074-05042A (part)	M 51 from NCL Niles NE'ly intermittently to 1,300 ft S of Berrien-Cass Co. Line	Reith-Riley Construction Co., Inc.	Material Service, Thornton, Ill.	Pit 14-36	NB SB	0.33 0.35	0.34 0.39	0.33 0.37
	Mb 11074-05042A (part)	M 60 from 1,278 ft W of Leet Rd NE'ly 1.28 mi	Reith-Riley Construction Co., Inc.	Material Service, Thornton, Ill.	Pit 14-36	EB WB	0.45 0.46	0.49 0.49	0.47 0.47
	Mb 11074-05042A (part)	M 60 from 1,000 ft NE of Yankee St NE'ly 0.78 mi	Reith-Riley Construction Co., Inc.	Material Service, Thornton, Ill.	Pit 14-36	EBOL EBIL	0.45 0.59	0.48 0.61	0.46 0.60
	Mb 13031-04837A	M 66 from S of "S" Drive S, N'ly to N of "E" Drive S, omitting from "L" Drive N'ly to N of "F" Drive S	Reith-Riley Construction Co., Inc.	Pit 39-1 & Material Service, Thornton, Ill.	Pit 13-8	NB SB	0.44 0.42	0.49 0.49	0.47 0.46

TABLE 2 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

1973 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 13032-04836A (part)	M 66 from Division St N'ly to Shell Dr	Reith-Riley Construction Co., Inc.	Pit 47-3 & 39-1	Pit 13-8	NBOL	0.41	0.42	0.41
					NBIL	0.34	0.38	0.36
					SBOL	0.44	0.47	0.46
					SBIL	0.34	0.37	0.36
Mb 13032-04836A (part)	M 66 from 0.34 mi N of Shell Dr N'ly	Reith-Riley Construction Co., Inc.	Pit 47-3 & 39-1	Pit 13-8	NB	0.32	0.35	0.33
					SB	0.30	0.33	0.32
Mb 13061-04838A	M 37 from Bedford Rd SE'ly to Van Buren St	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 13-38	NBOL	0.46	0.51	0.48
					NBIL	0.45	0.48	0.47
					SBOL	0.44	0.47	0.45
					SBIL	0.48	0.48	0.48
Mbr 13121-05171A	I 94 BL (Columbia Ave) from I 94 NE'ly to Skyline Dr	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 13-38	NB	0.42	0.46	0.44
					SB	0.38	0.41	0.40
Mbr 18031-04958A (part)	US 27 BR from 50 ft N of Parkway Dr N'ly to US 27	The Hicks Co.	Pit 17-66	Pit 37-26	NB	0.34	0.37	0.36
					SB	0.37	0.41	0.39
Mbr 18031-04958A (part)	US 10 from SCL Clare SE'ly 1.72 mi	The Hicks Co.	Pit 17-66	Pit 37-26	EB	0.35	0.37	0.36
					WB	0.36	0.37	0.36
Mbr 18031-04958A (part)	US 10 from 55 ft E of Ann Arbor RR W'ly to 600 ft W of Spruce St	The Hicks Co.	Pit 17-66	Pit 37-26	EBOL	0.46	0.48	0.47
					EBIL	0.45	0.49	0.47
					WBOL	0.44	0.47	0.46
					WBIL	0.47	0.48	0.48
Mb 19021-06075A	I 96 BL (N Grand River Ave) from 48 ft NW of C&O RR Grade Separation NW'ly to 1,895 ft SE of I 96	Reith-Riley Construction Co., Inc.	Pit 41-38	Pit 19-33	EB	0.43	0.45	0.44
					WB	0.46	0.48	0.47
Mb 21022-05203A	US 2, US 41 and M 35 from 250 ft N of C&NW RR intermittently to 1.2 mi N of Escanaba River	Payne and Dolan of Wisconsin, Inc.	Pit 21-46	Pit 21-65	EBOL	0.42	0.46	0.44
					EBIL	0.54	0.59	0.56
					WBOL	0.52	0.54	0.53
					WBIL	0.60	0.62	0.61
M 22023-05205A	US 2 from mp 1.7 to mp 2.3 in Vulcan	Fox Valley Construction Co.	Pit 75-5	Pit 21-65	EB	0.52	0.53	0.52
					WB	0.48	0.53	0.51
F 24011-00307A	US 31 from Charlevoix-Emmet Co. Line E'ly to WCL Petosky	Hodgkiss and Douma, Inc.	Pit 15-32	Pit 15-32	NB	0.31	0.40	0.35
					SB	0.34	0.41	0.37
U 24011-00308A	US 31 from WCL Petoskey E'ly to US 131	Hodgkiss and Douma, Inc.	Pit 15-32	Pit 15-32	NBOL	0.36	0.40	0.38
					NBIL	0.31	0.34	0.32
					SBOL	0.33	0.34	0.34
					SBIL	0.30	0.34	0.32
Mb 24011-03949A	US 31 from Liberty St W'ly and S'ly to US 131, Petoskey	Hodgkiss and Douma, Inc.	Pit 15-32	Pit 15-32	NBOL	0.27	0.29	0.28
					NBIL	0.26	0.28	0.27
					SBOL	0.27	0.28	0.27
					SBIL	0.25	0.26	0.25

TABLE 2 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

1973 CONT

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
FI 25031-04212A	I 75 from near Maple Rd N'ly to near Bristol Rd	Ann Arbor Construction Co.	Pit 63-88	Pit 63-88	NBOL	0.50	0.53	0.52
					NBCL	0.57	0.58	0.58
					NBIL	0.65	0.66	0.66
					SBOL	0.53	0.56	0.55
					SBCL	0.59	0.60	0.59
					SBIL	0.64	0.67	0.65
I 25031-04213A	I 75 from near Bristol Rd N'ly to N of Arlene Dr	Ann Arbor Construction Co.	Pit 63-88	Pit 63-88	NBOL	0.54	0.57	0.56
					NBCL	0.55	0.56	0.56
					NBIL	0.58	0.60	0.59
					SBOL	0.52	0.55	0.54
					SBCL	0.55	0.58	0.56
					SBIL	0.64	0.66	0.65
FI 25032-04215A	I 75 from S of GTW RR N'ly to Pasadena Ave	Bit-Con Corp.	Pit 47-3	Pit 63-4	NBOL	0.50	0.52	0.51
					NBCL	0.53	0.57	0.56
					NBIL	0.57	0.61	0.59
					SBOL	0.55	0.57	0.56
					SBCL	0.59	0.64	0.61
					SBIL	0.66	0.68	0.67
Mtb 25051-05458A	M 54 BR (Saginaw St) from Hemphill Rd N'ly to 9th St	Flint Asphalt and Paving Co.	Pit 32-4 & 63-4	Pit 47-35 & 63-54	NBOL	0.41	0.43	0.42
					NBIL	0.40	0.41	0.41
					SBOL	0.43	0.44	0.44
					SBIL	0.37	0.39	0.38
Mbr 33081-04974A (part)	WB M 43 from 100 ft W of Homer St W'ly to 170 ft W of Marshall St	Spartan Asphalt Paving Co.	Pit 47-3	Pit 47-43	WBOL	0.37	0.40	0.38
					WB#3	0.44	0.44	0.44
					WB#2	0.42	0.43	0.42
					WBIL	0.37	0.41	0.39
Mbr 33081-04974A (part)	I 96 BL (N Grand River) from 1,350 ft W of Waverly Rd SE'ly to 150 ft E of Capitol Ave	Spartan Asphalt Paving Co.	Pit 47-3	Pit 47-43	EBOL	0.35	0.40	0.38
					EBIL	0.44	0.49	0.46
					WBOL	0.35	0.38	0.36
					WBIL	0.43	0.44	0.43
Mb 38061-04776A	M 60 from Jackson-Calhoun Co. Line E'ly to 1,260 ft SW of Allman Rd	Ajax Paving Industries, Inc.	Pit 30-35	Pit 30-35	EB	0.36	0.40	0.38
					WB	0.40	0.42	0.41
Mb 38071-04777A	M 50 from 710 ft S of SCL Jackson SE'ly to 2,450 ft S of the Grand River bridge	Ajax Paving Industries, Inc.	Pit 30-35	Pit 30-35	EB	0.36	0.41	0.38
					WB	0.38	0.38	0.38
I 38101-00531A	I 94 - US 127 interchange area	Richardson Asphalt Corp.	Pit 47-3	Pit 30-35	EBOL	0.40	0.42	0.41
					EBIL	0.49	0.54	0.51
					WBOL	0.40	0.44	0.42
					WBIL	0.52	0.54	0.53

TABLE 2 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

1973 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
RSS 39081-00554A	M 43 (W Main St) from 700 ft E of First St E'ly to 10th St	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 39-1	EBOL	0.48	0.58	0.53
					EBIL	0.47	0.56	0.51
					WBOL	0.45	0.51	0.48
					WBIL	0.46	0.52	0.48
M 39081-02145A	M 43 from Van Buren-Kalamazoo Co. Line E'ly 0.68 mi	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 39-1	EB	0.53	0.56	0.54
					WB	0.51	0.55	0.53
Ms 41062-04233A	M 11 (28th St) from Highgate Ave E'ly to 250 ft E of Buchanan Ave	Michigan Colprovia Co.	Pit 41-16	Pit 41-22	EBOL	0.37	0.39	0.38
					EBIL	0.41	0.44	0.42
					WBOL	0.35	0.35	0.35
					WBIL	0.43	0.47	0.45
Mb 41062-04843A	M 11 (28th St) from C&O RR and Chicago Dr E'ly to Highgate Ave	Michigan Colprovia Co.	Pit 41-16	Pit 41-22	EBOL	0.40	0.43	0.42
					EBIL	0.44	0.48	0.46
					WBOL	0.39	0.43	0.41
					WBIL	0.44	0.47	0.45
Mb 41081-04844A	M 45 from Ottawa-Kent Co. Line E to Division St, omitting from Maynard Ave E to 290 ft E of Covell Rd	Reith-Riley Construction Co., Inc.	Pit 41-50	Pit 41-16	EBOL	0.42	0.44	0.43
					EBIL	0.44	0.48	0.47
					WBOL	0.39	0.51	0.45
					WBIL	0.46	0.48	0.47
Mb 49031-05208A	US 2 from Soo Line RR (1.27 mi E of Gould City) E'ly to M 117	Hodgkiss and Douma, Inc.	Pit 75-5	Pit 49-97	EB	0.50	0.54	0.52
					WB	0.46	0.56	0.51
Mtb 50021-04885A	Old M 59 (Auburn Rd) from relocation M 59 E'ly to Utica Rd	Stolaruk Asphalt Paving, Inc.	Pit 63-4	Pit 63-4	EB	0.38	0.42	0.40
					WB	0.35	0.36	0.36
Mb 55021-05212A (part)	US 41 from Menominee N'ly intermittently to US 2	Payne and Dolan of Wisconsin, Inc. & Fox Valley Construction Co.	Pit 75-5	Pit 21-65	NB	0.52	0.56	0.54
					SB	0.53	0.58	0.56
Mb 55021-05212A (part)	US 41 and US 2 E from Powers	Payne and Dolan of Wisconsin, Inc. & Fox Valley Construction Co.	Pit 75-5	Pit 21-65	EB	0.38	0.40	0.39
					WB	0.47	0.51	0.49
Mb 55021-05212A (part)	US 2 from Powers W to W of Co. Line	Payne and Dolan of Wisconsin, Inc. & Fox Valley Construction Co.	Pit 75-5	Pit 21-65	EB	0.59	0.66	0.62
					WB	0.60	0.67	0.64
F 59042-00810A	Connector from US 131 relocation to existing US 131 and M 46	Saginaw Asphalt Paving Co.	Pit 41-69	Pit 62-63	NB	0.62	0.65	0.64
					SB	0.61	0.63	0.62
Mbr 62032-05927A	M 37 from Pine Hill Rd in White Cloud N'ly to Pierce Rd in Brohman	Reith-Riley Construction Co., Inc.	Pit 41-38	Pit 62-33	NB	0.38	0.46	0.43
					SB	0.43	0.48	0.45
Mbr 63041-04953A	M 59 (Huron St) from Franklin Blvd E'ly to Wide Track Dr E, omitting from State St to Wide Track Dr W	A and A Asphalt Paving Co.	Pit 63-4	Pit 63-4	EBOL	0.40	0.41	0.41
					EBIL	0.38	0.44	0.41
					WBOL	0.38	0.44	0.42
					WBIL	0.42	0.47	0.44

TABLE 2 (Cont.)

BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

1973 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 63071-04948A	M 15 from 614 ft S of Cranberry Lake Rd N'ly 1.076 mi	Bit-Con Corp.	Pit 63-88	Pit 63-88	NB SB	0.46 0.48	0.50 0.53	0.48 0.51
M 63082-05220A	M 4 (Northwestern) from I 696, US 24 and US 10 NW'ly to Orchard Lake Rd	The Cooke Contracting Co.	Pit 63-4	Pit 63-4 & 50-41	NBOL NBIL SBOL SBIL	0.38 0.39 0.38 0.42	0.39 0.39 0.40 0.43	0.38 0.39 0.39 0.43
F 69023-00976A	M 32 from 1,723 ft W of Meecher Rd E'ly to Turtle Lake Rd	Lake Construction Co.	Pit 67-2	Pit 72-5	EBOL EBIL WBOL WBIL	0.46 0.44 0.49 0.49	0.48 0.47 0.52 0.51	0.47 0.46 0.51 0.50
RF 72023-01703A	M 55 connector to I 75	Lake Construction Co.	Pit 65-7	Pit 65-7	EBOL EBIL WBOL WBIL	0.50 0.59 0.56 0.64	0.54 0.61 0.61 0.69	0.51 0.60 0.58 0.66
I 72061-00995A	I 75 from Roscommon-Ogemaw Co. Line W'ly to 1.2 mi W of Co. Rd #500	Lake Construction Co.	Pit 65-7	Pit 65-7	NBOL NBIL SBOL SBIL	0.58 0.59 0.52 0.52	0.67 0.69 0.61 0.61	0.62 0.62 0.57 0.58
Ms 73062-04738A (T98004)	M 46 (Gratiot Rd) at Center Rd, 1.0 mi W of Saginaw (CS #73062)	A. J. Rehmus and Son, Inc.	Pit 71-47 & 71-15	Pit 63-54	EBOL EBIL WBOL WBIL	0.39 0.46 0.36 0.45	0.44 0.51 0.38 0.46	0.42 0.48 0.37 0.45
Mb 76011-04784A	M 52 from 525 ft N of Bath Rd in Perry N'ly to 85 ft S of Bennington Rd	Spartan Asphalt Paving Co.	Pit 47-3	Pit 47-43	NB SB	0.49 0.50	0.56 0.57	0.54 0.52
Mb 78011-04785A (part)	US 131 (CS #78031) from state line N to US 12	Reith-Riley Construction Co., Inc.	Material Service, Thornton, Ill.	Pit 12-44	NB SB	0.28 0.29	0.32 0.33	0.30 0.31
Mb 78011-04785A (part)	M 103 from Ohio state line N'ly to US 12	Reith-Riley Construction Co., Inc.	Material Service, Thornton, Ill.	Pit 12-44	NB SB	0.33 0.34	0.36 0.40	0.34 0.37
Mb 78011-04785A (part)	US 12 from M 103 E'ly to Mann Rd (CS #78021)	Reith-Riley Construction Co., Inc.	Material Service, Thornton, Ill.	Pit 12-44	EB WB	0.25 0.25	0.28 0.28	0.27 0.27
M 80042-01110A	M 43 from 3,825 ft W of M 40 E'ly to Van Buren-Kalamazoo Co. Line	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 39-1	EB WB	0.53 0.51	0.56 0.55	0.54 0.53

TABLE 2 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

1973 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mtb 80042-04566A	Old M 43 from W of 29th St SE'ly 1.39 mi	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 39-1	EB	0.41	0.45	0.43
					WB	0.40	0.44	0.42
Mb 81032-04852A Ms 81032-04929A	US 12 and US 12 BR from ECL Ypsilanti E'ly to Denton Rd in Wayne Co., omitting at Harris Rd	Thompson-McCully Co.	Pit 47-3	Pit 47-3	EBOL	0.35	0.38	0.36
					EBIL	0.43	0.47	0.45
					WBOL	0.36	0.37	0.37
					WBIL	0.43	0.47	0.45
Mb 81121-04853A	M 153 (Ford Rd) from 230 ft E of Frains Rd E'ly to 100 ft W of Napier Rd (Wayne Co. Line)	Ayling-Cunningham Asphalt Paving Co.	Pit 47-3	Pit 47-3	EB	0.53	0.57	0.55
					WB	0.48	0.52	0.50
Mb 82052-04854A	Various locations on NB US 24 in Dearborn, Dearborn Heights and Detroit	The Cooke Contracting Co.	Pit 47-3	Pit 81-78 & 47-3	NBOL	0.36	0.42	0.38
					NB#3	0.37	0.44	0.42
					NB#2	0.42	0.46	0.44
					NBIL	0.45	0.49	0.46
U 82142-01310A (part)	M 102 from WCL Ferndale E'ly to M 1 (Woodward Ave)	Stolaruk Asphalt Paving Co.	Pit 47-3	Pit 47-3	EBOL	0.40	0.42	0.41
					EB#3	0.46	0.51	0.48
					EB#2	0.47	0.53	0.49
					EBIL	0.48	0.54	0.52
					WBOL	0.41	0.44	0.42
					WB#3	0.39	0.44	0.41
					WB#2	0.41	0.46	0.43
					WBIL	0.42	0.44	0.43
U 82142-01310A (part)	M 102 from M 1 (Woodward Ave) E to Dequindre	Stolaruk Asphalt Paving Co.	Pit 47-3	Pit 47-3	EBOL	0.42	0.45	0.44
					EB#3	0.37	0.40	0.38
					EB#2	0.46	0.49	0.48
					EBIL	0.45	0.50	0.47
					WBOL	0.43	0.49	0.47
					WB#3	0.46	0.49	0.47
					WB#2	0.50	0.53	0.52
					WBIL	0.58	0.61	0.59
T 98058-01727A	M 53 (Van Dyke) from 14 Mile Rd N'ly to 15 Mile Rd (CS #50011)	Ajax Paving Industries, Inc.	Pit 63-4	Pit 63-4	NBOL	0.38	0.40	0.39
					NBCL	0.42	0.45	0.43
					NBIL	0.45	0.48	0.47
					SBOL	0.37	0.42	0.39
					SBCL	0.40	0.43	0.42
					SBIL	0.41	0.46	0.43
T 98058-01810A	M 3 (Gratiot) at 9 Mile Rd, at 10 Mile Rd and at Frazho Rd	The Cooke Contracting Co.	Pit 63-4	Pit 50-35	NBOL	0.43	0.44	0.44
					NB#3	0.39	0.44	0.42
					NB#2	0.40	0.44	0.42
					NBIL	0.42	0.48	0.45
					SBOL	0.42	0.43	0.42
					SBCL	0.41	0.44	0.43
					SBIL	0.41	0.45	0.43

TABLE 2 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mbr 01051-05118A	US 23 from 1,485 ft S of M 72 N to 0.475 mi N of Spruce Rd	Central Paving Co.	Pit 71-15	Pit 71-15	NB SB	0.45 0.44	0.58 0.58	0.53 0.51
Mb 06072-06123A (part)	US 23 from 400 ft S of NCL Standish NE'ly to 1,500 ft NE of W limits Omer	Saginaw Asphalt Paving Co.	Pit 71-15	Pit 71-15	NB SB	0.33 0.35	0.39 0.45	0.36 0.41
Mb 06072-06123A (part)	M 65 from 1,800 ft S of N limits Twining N'ly to Arenac-Iosco Co. Line	Saginaw Asphalt Paving Co.	Pit 71-15	Pit 71-15	NB SB	0.52 0.55	0.56 0.60	0.54 0.57
Mb 11021-06126A	US 12 from W limits Three Oaks E'ly to E limits Galien	John G. Yerington Construction Co.	Material Service, Thornton, Ill.	Pit 11-75	EB WB	0.33 0.37	0.45 0.44	0.39 0.40
M 11051-05491A[1] (Part)	US 31-US 33 from Fort St N'ly to M 60 BR (Main St)	Reith-Riley Construction Co., Inc.	Material Service, Thornton, Ill.	Pit 14-36	NBOL NBIL SBOL SBIL	0.39 0.39 0.34 0.38	0.41 0.42 0.35 0.40	0.40 0.40 0.34 0.39
Mb 11071-06128A (part)	M 140 from 1,050 ft N of SCL Watervliet N'ly 0.49 mi to Paw Paw River	Consumers Asphalt Paving Co.	Pit 39-1	Pit 14-19	NB SB	0.36 0.36	0.38 0.40	0.37 0.38
Mb 11071-06128A (part)	US 31-US 33 from 190 ft HW of Sunset Dr (across from Andrews Univ.) NW 0.52 mi	Consumers Asphalt Paving Co.	Pit 39-1	Pit 14-19	NB SB	0.38 0.36	0.39 0.41	0.39 0.38
Mbr 12022-06072A	US 12 from Jefferson St in Coldwater E'ly to West St in Quincy, omitting from Wright St E'ly to E of I 69	John G. Yerington Construction Co.	Pit 30-35 & 12-44	Pit 12-44	EB WB	0.38 0.30	0.40 0.33	0.39 0.31
Mb 13011-06073A (part)	M 37 from 350 ft N of M 89 N'ly to 2,272 ft N of "S" Dr	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 13-41	NBOL NBIL SBOL SBIL	0.44 0.46 0.38 0.32	0.47 0.48 0.41 0.38	0.46 0.47 0.40 0.35
Mb 13011-06073A (part)	M 37 from 152 ft N of "V" Dr N'ly to 1.05 mi N of Calhoun-Barry Co. Line	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 13-41	NB SB	0.38 0.24	0.42 0.27	0.40 0.26
Mb 13011-06073A (part)	M 89 from WCL Battle Creek SE'ly to M 37 omitting from Avery St to Miller St	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 13-41	EBOL EBIL WBOL WBIL	0.40 0.37 0.37 0.50	0.44 0.42 0.42 0.51	0.43 0.40 0.40 0.51
Mb 13022-06074A (part)	M 60 from the S branch of Kalamazoo River in Homer E'ly to 400 ft W of Calhoun-Jackson Co. Line, omitting divided highway at M 99	Reith-Riley Construction Co., Inc.	Pit 12-44	Pit 12-44	EB WB	0.41 0.40	0.53 0.44	0.47 0.42

1974

TABLE 2 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

1974 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 13022-06074A (part)	M 60 divided portion at M 99	Reith-Riley Construction Co., Inc.	Pit 12-44	Pit 12-44	EBOL	0.46	0.50	0.48
					EBIL	0.66	0.67	0.67
					WBOL	0.43	0.47	0.45
					WBIL	0.62	0.63	0.62
Mb 14011-06130A	M 60 (State St) from M 62 (Broadway) E'ly to E limits of Cassopolis	Reith-Riley Construction Co., Inc.	Material Service, Thornton, Ill.	Pit 14-36	EB	0.34	0.37	0.36
					WB	0.32	0.36	0.34
Mb 19062-06132A (part)	US 27 from N of Sturgis St, St. Johns N'ly 0.47 mi to bridge over GTW RR	Spartan Asphalt Paving Co.	Pit 47-3	Pit 47-43	NBOL	0.48	0.49	0.48
					NBIL	0.48	0.50	0.49
					SBOL	0.48	0.50	0.49
					SBIL	0.51	0.54	0.53
Mb 19062-06132A (part)	SB US 27 from 1,000 ft S of Oakland Ave in St. Johns N'ly 0.57 mi to N of Water Ave	Spartan Asphalt Paving Co.	Pit 47-3	Pit 47-43	SBOL	0.49	0.53	0.51
					SBIL	0.51	0.56	0.54
Mb 19062-06132A (part)	M 21 from 160 ft E of Scott Rd E'ly to Clinton-Shiawassee Co. Line	Spartan Asphalt Paving Co.	Pit 47-3	Pit 47-43	EB	0.44	0.53	0.48
					WB	0.41	0.54	0.47
Mb 23051-05616A (part)	M 50 from US 27 BR, Charlotte, E to 1,630 ft E of Penn Central RR	Reith-Riley Construction Co., Inc.	Pit 41-38	Pit 19-33	EB	0.41	0.44	0.42
					WB	0.40	0.44	0.42
Mb 23051-05616A (part)	M 79 from Wheaton Rd E'ly to M 78, Charlotte	Reith-Riley Construction Co., Inc.	Pit 41-38	Pit 19-33	EB	0.49	0.52	0.51
					WB	0.53	0.54	0.53
Mb 30041-06076A	M 34 from 1,790 ft E of Pleasant Rd E'ly to US 127	Ayling-Cunningham Asphalt Paving Co.	Pit 58-3 & 81-84	Pit 3-58	EB	0.33	0.55	0.43
					WB	0.35	0.51	0.43
Mb 30061-06077A	US 12 from US 127 SE'ly to 407 ft E of M 99	Ayling-Cunningham Asphalt Paving Co.	Pit 58-3	Pit 46-28	EB	0.41	0.51	0.49
					WB	0.41	0.51	0.48
Mb 33033-06079A	SB US 27 (Cedar) from 700 ft S of Kalamazoo St N'ly to 200 ft S of Grand River Ave, NB US 27 (Larch) from 530 ft S of Kalamazoo St N'ly to 470 ft N of Grand River Ave	Reith-Riley Construction Co., Inc.	Pit 14-38	Pit 19-33	NBOL	0.44	0.49	0.47
					NB#3	0.31	0.36	0.33
					NB#2	0.34	0.35	0.34
					NBIL	0.38	0.39	0.38
					SBOL	0.37	0.42	0.39
					SBCL	0.34	0.36	0.35
					SBIL	0.43	0.44	0.43
Mb 33082-06080A	M 43 from 1,000 ft E of Marsh Rd E to WCL Williamston	Spartan Asphalt Paving Co.	Pit 47-3	Pit 47-43	EB	0.44	0.52	0.46
					WB	0.37	0.54	0.46
F 37021-00519A	M 20 from C&O RR in Remus E'ly to Gilmore Rd	The Hicks Co.	Pit 37-26	Pit 37-26	EB	0.44	0.54	0.50
					WB	0.48	0.54	0.51
US 41041-04028A	M 21 at I 196 in Wyoming	Reith-Riley Construction Co., Inc.	Pit 41-16	Pit 41-16	EBOL	0.30	0.32	0.31
					EBIL	0.34	0.37	0.35
					WBOL	0.33	0.37	0.36
					WBIL	0.37	0.40	0.38

TABLE 2 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

1974 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 46062-06081A	US 23 from 200 ft W of Jefferson Ave, Blissfield, E'ly to Lenawee-Monroe Co. Line	Cunningham and Gooding	Pit 58-3	Pit 46-28	EB	0.33	0.48	0.43
					WB	0.35	0.47	0.40
Mbr 50012-06104A	M 53 from N end of freeway N'ly to Macomb-Lapeer Co. Line	Bit-Con Corp.	Pit 63-4	Pit 63-4	NB	0.42	0.52	0.48
					SB	0.46	0.55	0.51
Mbr 50022-06105A	M 59 from 1,300 ft E of Hayes Rd E'ly to M 97	Bit-Con Corp.	Pit 63-4	Pit 63-4	EB	0.38	0.45	0.41
					WB	0.42	0.49	0.44
U 50031-00670A	M 97 from M 102 NE'ly to 1,461 ft S of ECL Warren	The Cooke Contracting Co.	Pit 63-4	Pit 50-35	NBOL	0.46	0.50	0.48
					NBCL	0.49	0.54	0.52
					NBIL	0.49	0.54	0.51
					SBOL	0.49	0.52	0.51
					SBCL	0.52	0.56	0.54
					SBIL	0.51	0.53	0.52
U 50031-00671A	M 97 from Hayes Rd (Warren-Roseville City limits) NE'ly to 200 ft NE of 13 Mile Rd	Asphalt Products Corp.	E. C. Levy Dix yd	E. C. Levy Dix yd	NBOL	0.55	0.61	0.58
					NBCL	0.55	0.58	0.56
					NBIL	0.62	0.64	0.63
					SBOL	0.61	0.63	0.62
					SBCL	0.56	0.59	0.58
					SBIL	0.53	0.57	0.55
Mbr 59045-06782A	M 46 from C&O RR near Lewis St E'ly to ECL Edmore	Reith-Riley Construction Co., Inc.	Pit 41-38	Pit 37-26	EB	0.24	0.28	0.26
					WB	0.24	0.28	0.26
Mb 62012-06138A	M 37 from Bailey Rd in Bailey N'ly to N of Muskegon-Newaygo Co. Line	Reith-Riley Construction Co., Inc.	Pit 41-38	Pit 62-33	NB	0.50	0.52	0.51
					SB	0.56	0.60	0.58
Mb 63053-06084A	US 10 BR (Oakland St) from Cass and Montcalm St NW intermittently to 1,723 ft SE of M 15	Ann Arbor Construction Co.	Pit 63-60	Pit 63-60	NBOL	0.28	0.46	0.39
					NBIL	0.26	0.51	0.41
					SBOL	0.31	0.49	0.41
					SBIL	0.33	0.50	0.43
Mbr 63091-06106A	I 75 BL (Perry St) from 220 ft NE of Wide Track Dr NE'ly to 0.5 mi N of Opdyke Rd	Ajax Paving Industries, Inc.	Pit 63-4	Pit 63-4	NBOL	0.37	0.45	0.40
					NBIL	0.39	0.55	0.47
					SBOL	0.34	0.55	0.42
					SBIL	0.34	0.51	0.43
Mb 70041-06085A (part)	M 45 from 52nd Ave E to E of 26th Ave	Reith-Riley Construction Co., Inc.	Pit 41-50	Pit 41-16	EB	0.25	0.30	0.28
					WB	0.18	0.20	0.19
Mb 70041-06085A (part)	M 45 from E of 26th Ave E to Ottawa-Kent Co. Line	Reith-Riley Construction Co., Inc.	Pit 41-50	Pit 41-16	EBOL	0.27	0.35	0.31
					EBIL	0.31	0.39	0.35
					WBOL	0.29	0.37	0.32
					WBIL	0.26	0.33	0.30
I 70063-06780A	I 96 from Muskegon-Ottawa Co. Line SE'ly to Ottawa-Kent Co. Line	Woodland Paving Co.	Pit 41-48	Pit 41-48	EBOL	0.42	0.50	0.45
					EBIL	0.52	0.58	0.55
					WBOL	0.39	0.46	0.42
					WBIL	0.48	0.60	0.55

TABLE 2 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

1974 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 72013-06140A	US 27 from Snowbowl Rd N'ly to the maintenance crossover N of M 55	Lake Construction Co.	Pit 72-5	Pit 72-5	NBOL	0.48	0.53	0.51
					NBIL	0.51	0.59	0.53
					SBOL	0.42	0.55	0.50
					SBIL	0.53	0.63	0.59
Mbr 73021-05928A	M 57 from M 52 E'ly to Stuart Rd, Chesaning	Frank Strausberg and Son Co.	Pit 63-4	Pit 76-47	EB	0.41	0.46	0.44
					WB	0.39	0.46	0.42
Mb 73063-06142A	M 46 from Tower Line Rd E'ly to 1,650 ft E of Portsmouth Rd	Saginaw Asphalt Paving Co.	Pit 71-47	Pit 63-29	EB	0.38	0.41	0.39
					WB	0.42	0.44	0.43
Mb 76062-06143A (part)	M 21 from 581 ft W of Serr Rd E'ly to 948 ft W of M 13	Spartan Asphalt Paving Co.	Pit 63-4	Pit 63-29	EB	0.41	0.44	0.42
					WB	0.36	0.49	0.41
Mb 76062-06143A (part)	M 21 from 75 ft E of Smith Rd E'ly to 53 ft W of Chestnut St in Owosso	Spartan Asphalt Paving Co.	Pit 63-4	Pit 63-29	EB	0.27	0.30	0.29
					WB	0.33	0.36	0.34
Mbr 77051-04849A Ms 77051-04916A	M 29 from 500 ft N of Dyke Rd S'ly 3.37 mi	Howell Construction Co.	Pit 71-47	Pit 50-35	EB	0.38	0.50	0.44
					WB	0.37	0.51	0.44
Mb 77051-05929A	M 29 from 1,100 ft W of Pearl Beach Ave SE'ly and NE'ly to 350 ft N of Francis St, N of Marine City	Howell Construction Co.	Pit 71-47	Pit 50-35	NB	0.33	0.53	0.46
					SB	0.37	0.54	0.45
Mb 78022-06129A (part)	US 12 from 150 ft E of Halfway Rd NE'ly to W limits of Bronson	John G. Yerington Construction Co.	Pit 58-3	Pit 12-12	EB	0.42	0.48	0.45
					WB	0.44	0.48	0.47
Mb 78022-06129A (part)	M 66 in Sturgis from US 12 N to Lafayette St	John G. Yerington Construction Co.	Pit 58-3	Pit 12-12	NBOL	0.44	0.47	0.45
					NBIL	0.42	0.44	0.43
					SBOL	0.49	0.51	0.50
					SBIL	0.40	0.43	0.42
Mb 80071-06144A (part)	M 51 from 3,055 ft N of 82nd Ave N to 1,080 ft S of I 94	Klett Construction Co.	Pit 39-1	Pit 14-51	NB	0.36	0.46	0.41
					SB	0.33	0.37	0.35
Mb 80071-06144A (part)	M 43 from WCL Bangor SE'ly to ECL Bangor	Klett Construction Co.	Pit 39-1	Pit 14-51	EB	0.40	0.41	0.41
					WB	0.37	0.42	0.39
Mb 81011-06145A	M 52 from Penn Central RR in Chelsea N'ly to 1,350 ft NW of Roepke Rd	Ayling-Cunningham Asphalt Paving Co.	Pit 81-57	Pit 81-78	@ N Limits of Chelsea			
					NB	0.25	0.29	0.28
					SB	0.26	0.28	0.27
					N of Clark Lake Rd			
					NB	0.35	0.37	0.36
					SB	0.40	0.44	0.42
					S of Territorial Rd			
					NB	0.46	0.47	0.46
					SB	0.36	0.40	0.38
IS 81062-03562A	I 94 from 510 ft W of Wagner Rd E'ly and S'ly to 130 ft S of Liberty Rd	Ann Arbor Construction Co.	Pit 47-3	Pit 47-3	EBOL	0.38	0.47	0.42
					EBIL	0.47	0.50	0.49
					WBOL	0.41	0.44	0.43
					WBIL	0.40	0.48	0.44

TABLE 2 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) CONSTRUCTED IN 1971, 1972, 1973, AND 1974

1974 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 81063-06087A	US 12 from I 94 NE'ly to US 12 BR (Michigan Ave)	Thompson-McCully Co.	Pit 47-3	Pit 47-3	EBOL	0.53	0.56	0.55
					EB#3	0.49	0.54	0.52
					EB#2	0.46	0.51	0.49
					EBIL	0.54	0.56	0.55
					WBOL	0.56	0.58	0.57
					WB#3	0.51	0.56	0.54
					WB#2	0.56	0.60	0.57
					WBIL	0.67	0.69	0.68
I 82022-04950A	I 94 from US 24 E'ly and NE'ly to Rouge River	Ajax Paving Industries, Inc.	E.C. Levy Dix yd	E.C. Levy Dix yd	EBOL	0.46	0.48	0.47
					EBCL	0.47	0.50	0.49
					EBIL	0.46	0.51	0.48
					WBOL	0.46	0.49	0.47
					WBCL	0.47	0.51	0.50
					WBIL	0.49	0.52	0.50
Mtb 82101-05520A	M 14 from Manor Ave E to Grand River Ave	Ajax Paving Industries, Inc.	E.C. Levy Dix yd	E.C. Levy Dix yd	EBOL	0.52	0.56	0.54
					EBIL	0.56	0.58	0.57
					WBOL	0.55	0.60	0.58
					WBIL	0.55	0.59	0.57
Mbr 82151-04855A	M 53 (Van Dyke) from 193 ft N of I 94 N'ly to 122 ft S of M 102	The Cooke Contracting Co.	E.C. Levy Dix yd	E.C. Levy Dix yd	NBOL	0.49	0.60	0.55
					NBIL	0.47	0.62	0.55
					SBOL	0.56	0.59	0.58
					SBIL	0.53	0.59	0.56
T 98002-04730A	M 56 at Dye Rd (CS #25081)	Spartan Asphalt Paving Co.	Pit 63-4	Pit 63-29	EBOL	0.30	0.35	0.33
					EBIL	0.40	0.45	0.43
					WBOL	0.36	0.40	0.38
					WBIL	0.41	0.45	0.43
I 98004-04607A	M 84 (Bay Rd) from Deidorfer St N'ly to 300 ft N of Shattuck Rd (CS #73033)	Saginaw Asphalt Paving Co.	Pit 17-40	Pit 63-29	NBOL	0.44	0.46	0.45
					NBIL	0.43	0.46	0.44
					SBOL	0.43	0.46	0.45
					SBIL	0.37	0.42	0.40

[1] See Table 1 for additional data.

TABLE 3
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1973 AND 1974

	Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
				Coarse	Fine		Low	High	Avg
1973	RF 02041-00010A	M 28 from Rathfoot roadside park E'ly to concrete pavement	Payne and Dolan of Wisconson, Inc.	Pit 2-45	---	EB WB	0.56 0.61	0.60 0.66	0.58 0.64
	Mb 05071-04834A	US 131 and M 66 from M 72 in Kalkaska NE'ly to M 66 in Mancelona	Hodgkiss and Douma, Inc.	Pit 40-1	---	NB SB	0.34 0.31	0.48 0.48	0.42 0.41
	Mb 09042-04798A	M 25 from Finn Rd E'ly to Bay-Tuscola Co. Line	Saginaw Asphalt Paving Co.	Pit 79-59	---	EB WB	0.41 0.43	0.46 0.46	0.44 0.45
	Mb 11074-05042A	M 140 from 150 ft N of US 31-US 33 N'ly and E'ly intermittently to 30 ft E of Preston Rd	Reith-Riley Construction Co., Inc.	Pit 14-55	---	NB SB	0.43 0.41	0.46 0.43	0.44 0.42
	Mb 13092-04839A	M 99 from EB M 60 N to Crandall St in Albion	E. A. Richardson Co.	Pit 38-78	---	NB SB	0.41 0.43	0.46 0.48	0.44 0.45
	Mb 17061-03947A	M 28 from Luce-Chippewa Co. Line E'ly to 275 ft W of M 123	Hodgkiss and Douma, Inc.	Pit 48-20	Pit 17-10	EB WB	0.64 0.62	0.71 0.69	0.67 0.65
	Mtb 18022-05548A	US 10 from 600 ft W of Spruce St (WCL Clare) NW'ly to M 115	Reith-Riley Construction Co., Inc.	Pit 54-40	---	EB WB	0.38 0.34	0.46 0.44	0.41 0.41
	Mb 20022-04840A	M 72 from I 75 E to Stephens Bridge Rd	Lake Construction Co.	Pit 69-46	---	EB WB	0.37 0.36	0.45 0.42	0.40 0.40
	Mbr 23111-05921A (part)	M 188 from M 99 E'ly and SE'ly to 100 ft SE of Haven St in Eaton Rapids	Ajax Paving Industries, Inc.	Pit 33-9	---	EB WB	0.41 0.42	0.44 0.45	0.42 0.43
	Mbr 23111-05921A (part)	M 99 from I 94 N'ly to SCL Springport (CS #38011)	Ajax Paving Industries, Inc.	Pit 38-48	---	NB SB	0.45 0.48	0.56 0.53	0.50 0.49
	Mb 26011-04773A (part)	M 61 from Clare-Gladwin Co. Line E'ly to M 18 west junction (CS #26021)	The Hicks Co.	Pit 26-8	---	EB WB	0.50 0.53	0.61 0.59	0.54 0.56
	Mb 26011-04773A (part)	M 18 from M 61 N to 380 ft N of Clending Rd (CS #26012) and from 80 ft S of Burgess Rd N to 120 ft N of Wood Rd (CS #26011)	The Hicks Co.	Pit 26-8	---	NB SB	0.38 0.48	0.60 0.51	0.50 0.50
	Mbı 27022-05922A	US 2 from 3.2 mi SE of Wakefield SE'ly intermittently to 0.25 mi W of west junction M 64	Mathy Construction Co.	Pit 27-52	---	EB WB	0.70 0.65	0.75 0.74	0.72 0.69
	Mbr 31031-02394A	M 203 from 1,050 ft W of E boundary of McLain State Park NE'ly on relocation for 0.909 mi	George Hocking Construction Co.	Pit 31-65	---	NB SB	0.59 0.58	0.62 0.62	0.60 0.61
	Mb 33021-04774A	M 36 from 150 ft NW of Curtis St in Mason E'ly intermittently to 0.5 mi W of M 52	Spartan Asphalt Paving Co.	Pit 19-46	---	EB WB	0.37 0.24	0.52 0.52	0.42 0.42
	Mb 38011-04842A	M 99 from SCL Springport N'ly and E'ly to ECL	Ajax Paving Industries, Inc.	Pit 38-48	---	NB SB	0.38 0.39	0.42 0.44	0.40 0.41

TABLE 3 (Cont.)
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1973 AND 1974

1973 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mtb 39081-02909A	Existing M 43 (W Main) from 1,100 ft E of 2nd St E'ly to 1,800 ft W of 4th St	Reith-Riley Construction Co., Inc.	Pit 39-1	Pit 39-1	EB WB	0.45 0.46	0.48 0.50	0.46 0.47
RF 40022-00559A	M 72 and M 66 relocation from US 131 E'ly to M 66 S	Peninsula Asphalt Corp.	Pit 40-18	---	EB WB	0.41 0.45	0.43 0.46	0.42 0.45
Mtb 40022-02903A	M 66 and M 72 from intersection M 66 and M 72 N to US 131	Peninsula Asphalt Corp.	Pit 40-18	---	NB SB	0.42 0.35	0.46 0.39	0.45 0.37
Mb 44061-05926A	M 90 from 1,500 ft W of Pleasant Lake Rd E'ly to M 53	Williams Bros. Asphalt Paving Co.	Pit 44-40 & 74-62	---	EB WB	0.61 0.62	0.76 0.74	0.69 0.68
Mb 46061-04845A	US 223 from 1,200 ft NW of Onsted Rd N'ly to US 127	Ayling-Cunningham Asphalt Paving Co.	Pit 81-84	---	NB SB	0.33 0.30	0.48 0.42	0.39 0.38
Mbr 49031-05207A	M 117 from US 2 N'ly to Engadine	Hodgkiss and Douma, Inc.	Pit 49-74	---	NB SB	0.56 0.57	0.58 0.59	0.57 0.58
Mb 49031-05208A	M 117 from Engadine N to Co. Line	Hodgkiss and Douma, Inc.	Pit 49-74	---	NB SB	0.56 0.59	0.61 0.65	0.59 0.62
Mb 49041-05209A	M 134 from 1.96 mi W of M 129 E to Mackinac-Chippewa Co. Line	Lake Construction Co.	Pit 49-53	---	EB WB	0.55 0.57	0.65 0.61	0.60 0.58
Mbr 53033-05041A (part)	US 31 from Mason-Oceana Co. Line N to US 10 (CS #53031)	Laman Asphalt and Paving Co.	Pit 62-49	---	NB SB	0.42 0.37	0.44 0.43	0.43 0.40
Mbr 53033-05041A (part)	US 31 from US 10 in Scottville N to Hoague Rd	Laman Asphalt and Paving Co.	Pit 62-49	---	NB SB	0.39 0.46	0.42 0.49	0.41 0.47
Mbr 53033-05041A (part)	US 10 from US 31 in Scottville E to ECL (CS #53022)	Laman Asphalt and Paving Co.	Pit 62-49	---	EB WB	0.41 0.38	0.44 0.40	0.43 0.39
RS 57013-04474A	M 66 from M 42 N'ly and NE'ly to Phelps Rd	Reith-Riley Construction Co., Inc.	Pit 57-12	---	NB SB	0.21 0.42	0.54 0.52	0.45 0.47
Mbr 59023-04846A	M 57 from M 66 E'ly to Carson City	The Hicks Co.	Pit 59-65	---	EB WB	0.49 0.48	0.58 0.56	0.53 0.52
Mtb 62011-05460A	Old M 20 from Stewart St in Fremont E'ly and N'ly to WCL White Cloud, omitting from Freemont to Baldwin Ave	Reith-Riley Construction Co., Inc.	Pit 62-33	---	EB WB	0.51 0.50	0.55 0.53	0.53 0.52
Mb 66032-06027A (part)	US 45 from M 28 N to Rockland Rd	Fox Valley Construction Co.	Pit 66-97	---	NB SB	0.66 0.67	0.72 0.72	0.69 0.70
Mb 66032-06027A (part)	M 64 from 230 ft N of M 28 N'ly 3.714 mi	Fox Valley Construction Co.	Pit 66-97	---	NB SB	0.63 0.66	0.67 0.69	0.65 0.67
Mb 66032-06027A (part)	M 38 from M 26 E'ly 6.305 mi to 0.394 mi E of Ontonagon-Houghton Co. Line (CS #66041)	Fox Valley Construction Co.	Pit 66-97	---	EB WB	0.72 0.71	0.75 0.75	0.73 0.72

TABLE 3 (Cont.)
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1973 AND 1974

	Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
				Coarse	Fine		Low	High	Avg
1973 CONT.	F 69023-00976A	M 32 from 1,723 ft W of Meecher Rd E'ly (partly on relocation) to Turtle Lake Rd	Lake Construction Co.	Pit 16-69 & 69-40	---	EB WB	0.55 0.55	0.56 0.59	0.56 0.57
	Mb 71021-04847A	M 68 from 680 ft W of Clark St in Tower E intermittently to 6.02 mi E of Cheboygan-Presque Isle Co. Line	Lake Construction Co.	Pit 71-46 & 71-15	---	EB WB	0.46 0.47	0.51 0.53	0.49 0.50
	Mb 71021-04848A	M 68 from US 23 W'ly 7.15 mi	Lake Construction Co.	Pit 71-46 & 71-15	---	EB WB	0.54 0.50	0.58 0.58	0.55 0.55
	Mbr 74062-06108A	M 46 from 150 ft W of Ruth Rd E'ly to E limits Carsonville	Williams Bros. Asphalt Paving Co.	Pit 44-40	---	EB WB	0.66 0.66	0.68 0.67	0.67 0.66
	Mb 79041-04850A	M 46 from 175 ft E of M 15 E'ly to 132 ft E of Vassar Rd	Frank Strausberg and Son Co.	Pit 79-81	---	EB WB	0.50 0.50	0.53 0.54	0.51 0.52
	Mb 80042-04851A	M 43 from 725 ft W of Co. Rd #215 E'ly to 220 ft E of 41st St, omitting from E of 52nd St to W of 44th St	Klett Construction Co.	Pit 39-1 & 80-26	---	EB WB	0.39 0.39	0.46 0.45	0.43 0.41
	M 83022-01420A	M 55 from ECL Cadillac E'ly to Wexford-Missaukee Co. Line	Reith-Riley Construction Co., Inc.	Pit 57-12 & 83-57	---	EB WB	0.41 0.40	0.43 0.46	0.42 0.44
	Mb 83022-04799A	M 55 from Carmel St in Cadillac E'ly to Crosby Rd (ECL)	Reith-Riley Construction Co., Inc.	Pit 57-12 & 83-57	---	EB WB	0.40 0.39	0.42 0.42	0.41 0.41
1974	Mb 01011-06122A	M 65 from Hale N'ly to M 72	Central Paving Co.	Pit 35-14	---	NB SB	0.28 0.25	0.56 0.53	0.40 0.37
	Mbr 02011-06023A	US 41 from 3.8 mi NW of M 67 SE'ly and S'ly to 10.8 mi N of US 2	Payne and Dolan of Wisconsin, Inc.	Pit 52-39	---	NB SB	0.51 0.55	0.60 0.64	0.56 0.60
	Mb 02021-06024A	M 94 from M 67 E'ly to 3 mi SW of M 28	Payne and Dolan of Wisconsin, Inc.	Pit 2-1	---	EB WB	0.48 0.48	0.61 0.59	0.56 0.53
	Mbr 08011-06100A	M 43 from 200 ft S of Brush St N'ly to 2,200 ft N of Cloverdale Rd	Reith-Riley Construction Co., Inc.	Pit 8-43	---	NB SB	0.36 0.36	0.38 0.37	0.37 0.36
	Mb 10042-06125A	M 115 from 502 ft NW of Wexford-Manistee Co. Line NW'ly to US 31	Hodgkiss and Douma, Inc.	Pit 51-8	---	EB WB	0.43 0.43	0.50 0.52	0.46 0.46
	Mb 11071-06128A	M 140 from M 62 N'ly to Napier Ave	Consumers Asphalt Paving Co.	Pit 14-19	---	NB SB	0.30 0.22	0.41 0.44	0.37 0.35
	Mbr 14032-05920A	M 62 from M 60 in Cassopolis N'ly and W'ly to ECL Dowagiac	Reith-Riley Construction Co., Inc.	Pit 14-36	---	NB SB	0.34 0.26	0.42 0.51	0.38 0.38

TABLE 3 (Cont.)
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1973 AND 1974

1974 CONT.

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 17021-06131A	M 134 from Mackinac-Chippewa Co. Line E'ly to Dawson St Detour	Lake Construction Co.	Pit 49-53	---	EB WB	0.55 0.50	0.60 0.60	0.57 0.54
Mbr 32022-06101A	M 142 from 250 ft W of Ruth Rd NE'ly to M 25 thence N'ly to Lytle St	Williams Bros. Asphalt Paving Co.	Pit 32-48	---	EB WB	0.50 0.46	0.55 0.51	0.53 0.49
Mb 32031-06078A	M 53 from Sanilac-Huron Co. Line N'ly and E'ly to NCL Bad Axe	Williams Bros. Asphalt Paving Co.	Pit 32-48	---	NB SB	0.38 0.44	0.48 0.50	0.44 0.46
Mbr 44011-05569A	M 24 from 1.31 mi N of Oakland-Lapeer Co. Line N'ly to M 21	Howell Construction Co.	Pit 44-8	---	NB SB	0.47 0.42	0.53 0.51	0.50 0.47
Mb 52042-06784A	US 41 and M 28 from 376 ft W of 2nd St in Ishpeming E'ly to 344 ft E of WCL Marquette	Payne and Dolan of Wisconsin, Inc.	Pit 52-68	---	EBOL EBIL WBOL WBIL	0.44 0.51 0.45 0.40	0.54 0.62 0.60 0.63	0.49 0.55 0.52 0.50
Mb 54032-06136A	M 66 from M 46 N'ly to the S branch of the Chippewa River	The Hicks Co.	Pit 54-50	---	NB SB	0.37 0.37	0.45 0.51	0.41 0.43
Mb 62012-06138A	M 20 from M 37 E'ly and N'ly to 1,965 ft N of 6 Mile Rd	Reith-Riley Construction Co., Inc.	Pit 62-33	---	EB WB	0.42 0.40	0.50 0.48	0.46 0.44
Mb 67022-06139A (part)	US 10 from M 66 E'ly to Clare-Osceola Co. Line	The Hicks Co.	Pit 54-45	---	EB WB	0.51 0.38	0.53 0.44	0.52 0.41
Mb 67022-06139A (part)	M 66 from US 10 N intermittently to M 115	The Hicks Co.	Pit 54-45	---	NB SB	0.37 0.35	0.50 0.50	0.44 0.43
Mb 67022-06139A (part)	M 115 from M 66 E'ly intermittently to Clare-Osceola Co. Line	The Hicks Co.	Pit 54-45	---	EB WB	0.38 0.40	0.39 0.44	0.39 0.42
Mb 72041-06141A	M 144 from 1,000 ft NE of AuSable River NE'ly and E'ly 6.837 mi to 0.09 mi NE of Roscommon-Crawford Co. Line	Lake Construction Co.	Pit 72-12	---	NB SB	0.41 0.40	0.54 0.53	0.49 0.47
Mb 74012-06086A	M 53 from M 46 N'ly to Shabbana Rd	Frank Strausberg and Son Co.	Pit 74-10	---	NB SB	0.37 0.41	0.47 0.47	0.43 0.45
Mb 80071-06144A	M 40 from 41 ft N of Van Buren St in Gobles N'ly to 40 ft S of Van Buren-Allegan Co. Line	Klett Construction Co.	Pit 80-26	---	NB SB	0.26 0.28	0.36 0.34	0.30 0.30
Mb 81013-06146A	M 52 from 100 ft N of US 12 N'ly to 25 ft S of Duncan St in Manchester	Cunningham and Gooding	Pit 81-84	---	NB SB	0.37 0.35	0.41 0.41	0.40 0.37

TABLE 4
MISCELLANEOUS BITUMINOUS SURFACES CONSTRUCTED IN 1972

	Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
				Coarse	Fine		Low	High	Avg
1972	Mm 2 SC-6D (part)	M 90 from M 24 E'ly to Lapeer-Sanilac Co. Line, omitting from 1,550 ft W of Jefferson St in N Branch E'ly and S'ly to S junction M 90 and M 53 (CS #44061)	C. R. Hunt Construction Co.	Pit 63-4	---	EB WB	0.73 0.69	0.78 0.74	0.76 0.73
	Mm 2 SC-6D (part)	M 90 and M 53 from S junction M 90 to N junction (CS #44032)	C. R. Hunt Construction Co.	Pit 63-4	---	NB SB	0.60 0.55	0.62 0.58	0.61 0.57

TABLE 5
CONVENTIONAL CONCRETE AND BITUMINOUS PAVEMENT
SUMMARY FOR THE 1974 TEST YEAR

Surface Type	Service Year When Tested	Total Lanes Tested	Total Lane Miles Tested	Average Friction Level
Concrete	Initial	46	87.686	0.55
	1	56	56.824	0.54
	2	6	11.560	0.55
Bituminous Concrete	Initial	173	690.986	0.45
	1	204	528.468	0.46
	2	6	6.240	0.36
	3	2	9.320	0.40
Bituminous Aggregate	Initial	44	468.772	0.45
	1	82	474.938	0.51
Single Seal	2	4	23.020	0.67

SECTION II

FRICTION LEVELS DETERMINED FOR PAVEMENTS AFTER FIVE YEARS OF SERVICE

Friction Levels Determined for Pavements After Five Years of Service

Table 6 contains skid test results from 19 portland cement concrete projects consisting of 98 lanes which were constructed in 1969. Initial service year tests were conducted on seven of these projects and resulting Wsf values averaged 0.53. Ten of the projects were first tested in 1970 after a one-year service period and friction levels on these averaged 0.46. Three projects were tested after a two-year service period; Wsf values averaged 0.45. After five years of service, all 19 projects were tested. Wsf values for the 98 lanes averaged 0.35. Seventy-one percent of the 164.804 lane miles averaged less than 0.40; 14 percent averaged less than 0.30.

Table 7 lists skid test results of 31 bituminous concrete (4.12) projects constructed during 1969. In all, 102 lanes (293.894 lane miles) were tested. Average coefficients of friction determined initially and after a one- and a two-year service period were 0.49, 0.51, and 0.48, respectively. Skid tests were conducted again in 1974, after five service years on these same 31 projects and Wsf values averaged 0.44. Twenty percent of the lane miles yielded five-year Wsf values below 0.40. No lanes exhibited five-year Wsf values averaging lower than 0.30.

Table 8 contains skid test results from 13 bituminous aggregate (4.11) projects of which 26 lanes (192.022 lane miles) were tested. Eighteen of the lanes were tested during their initial service year; the average Wsf value was 0.46. The remaining eight were tested after a one-year service period and resulting skid tests yielded an average friction level of 0.56. Skid tests were conducted again in 1974 on these bituminous aggregate projects. The overall five-year average Wsf value was 0.52. Only 3 percent of the lane miles yielded five-year Wsf values averaging below 0.40.

Table 9 contains four 1969 construction non-skid surface treatment projects. Skid tests were conducted on 50.928 lane miles (eight lanes) of this surface type. Four lanes (27.660 lane miles) were tested during the initial service year and four lanes (23.268 lane miles) were tested after a one-year service period. Both initial and one-year friction levels averaged 0.58. Skid tests were conducted again in 1974 on these four projects and resulting five-year Wsf values averaged 0.49. Two lanes, representing 32 percent of the lane mileage had average friction levels below 0.40.

Table 9 also contains skid test results from 29 stone-filled sand-asphalt lanes (nine projects). Six projects were tested during the initial service year and yielded friction levels averaging 0.44. The remaining three projects had an average Wsf value of 0.58 at the one-year service level. After five service years, all projects were tested again and an average Wsf value of 0.44 was determined. Six percent of the lane miles tested had friction levels averaging below 0.40 after five years of service.

TABLE 6
CONCRETE PAVEMENTS CONSTRUCTED IN 1969

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction			
			Coarse	Fine		1969	1970	1971	1974
U 11031-004	M 139 from I 94 N'ly to Ox Creek and Pennsylvania Central RR	Carl Goodwin and Sons, Inc.	Pit 75-5	Pit 14-45	NBOL	----	0.31	----	0.23
					NBIL	----	0.39	----	0.21
					SBOL	----	0.46	----	0.22
					SBIL	----	0.36	----	0.27
I 23081-002	I 496 comm. at I 96 thence E'ly to Waverly Rd	Eisenhour Construction Co.	Pit 41-46	Pit 19-33	EBOL	0.55	----	----	0.31
					EBIL	0.56	----	----	0.39
					WBOL	0.52	----	----	0.32
					WBIL	0.55	----	----	0.34
F 25042-015	M 78 relocation from E of Bristol Rd E'ly to W City Limits of Flint	Cooke Contracting Co.	Pit 63-54	Pit 63-54	EBOL	----	0.53	----	0.42
					EBCL	----	0.51	----	0.39
					EBIL	----	0.60	----	0.43
					WBOL	----	0.44	----	0.41
					WBCL	----	0.44	----	0.40
					WBIL	----	0.55	----	0.44
F 25084-015	M 78 from approximately 500 ft W of Howe Rd E'ly to Vassar Rd	Denton Construction Co.	Pits 63-56 & 63-54	Pits 63-56 & 63-54	EBOL	----	0.52	----	0.28
					EBCL	----	0.50	----	0.32
					EBIL	----	0.50	----	0.39
					WBOL	----	0.56	----	0.26
					WBCL	----	0.56	----	0.35
					WBIL	----	0.62	----	0.44
F 25084-016[1] (part)	M 78 (extended) from Vassar Rd E to M 15 (Station 888+00 to 933+63 Only)	Denton Construction Co.	Pit 63-54	Pit 63-54	EBOL	----	0.47	----	0.32
					EBCL	----	0.53	----	0.34
					EBIL	----	0.56	----	0.43
					WBOL	----	0.43	----	0.34
					WBCL	----	0.52	----	0.37
					WBIL	----	0.56	----	0.46
F 25084-016[2] (part)	M 78 (extended) from Vassar Rd E to M 15 (Station 933+63 to 1078+00 Only)	Sargent Construction Co.	Pit 63-56	Pit 63-56	EBOL	----	0.43	----	0.32
					EBIL	----	0.52	----	0.36
					WBOL	----	0.41	----	0.35
					WBIL	----	0.47	----	0.36
U 25085-002	M 78 relocation from S of Ballenger Hwy E'ly to W of Fenton Rd	Cooke Contracting Co.	Pit 63-54	Pit 63-54	EBOL	----	----	0.36	0.27
					EBCL	----	----	0.50	0.30
					EBIL	----	----	0.52	0.34
					WBOL	----	----	0.35	0.31
					WBCL	----	----	0.43	0.31
					WBIL	----	----	0.52	0.33

[1] Conventional Paver used.
[2] Slip-Form Paver used.

TABLE 6 (Cont.)
CONCRETE PAVEMENTS CONSTRUCTED IN 1969

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction			
			Coarse	Fine		1969	1970	1971	1974
F 25085-015	M 78 relocation from Hammerburg Rd E'ly to E of Saginaw St	Cooke Contracting Co.	Pit 63-54	Pit 63-54	EBOL	----	----	----	0.32
					EB#3	----	----	0.39	0.31
					EB#2	----	----	0.43	0.29
					EBIL	----	----	0.58	0.26
					WBOL	----	----	0.45	0.27
					WB#3	----	----	0.40	0.27
					WB#2	----	----	0.48	0.31
					WBIL	----	----	0.59	0.35
SS 25101-012	M 57 from E City Limits of Clio E'ly to M 54	W. F. McNally Co.	Pit 17-66	Pit 25-8	EBOL	----	0.38	----	0.23
					EBIL	----	0.42	----	0.26
					WBOL	----	0.38	----	0.26
					WBIL	----	0.40	----	0.26
U 31051-014	US 41 relocation from 280 ft W of Division St W'ly to 270 ft W of Pearl St, City of Houghton	Proksch Construction Co.	Pit 31-45	Pit 31-45	NBOL	----	0.45	----	0.35
					NBIL	----	0.50	----	0.38
					SBOL	----	0.52	----	0.35
					SBIL	----	0.49	----	0.38
U 33171-025	US 127 from Red Cedar River N'ly to S of Woodruff Ave	Eisenhour Construction Co.	Pits 34-53 & 41-46	Pit 19-33	NBOL	----	----	0.34	0.42
					NBIL	----	----	0.48	0.45
					SBOL	----	----	0.32	0.34
					SBIL	----	----	0.48	0.36
U 38083-017	I 94 BL - US 27 BR - M 50 (Michigan Ave) from W of Lydia St NE'ly to W of intersection of Clinton St and Jackson St	Denton Construction Co.	Pit 30-35	Pit 30-35	EBOL	----	0.38	----	0.32
					EBCL	----	0.41	----	0.35
					EBIL	----	0.41	----	0.33
					WBOL	----	0.37	----	0.35
					WBCL	----	0.40	----	0.33
					WBIL	----	0.42	----	0.36
F 41132-021	US 131 relocation from S of Post Rd to S of 10 Mile Rd	Denton Construction Co.	Pit 41-38	Pit 41-38	NBOL	0.63	----	----	0.36
					NBIL	0.58	----	----	0.38
					SBOL	0.63	----	----	0.39
					SBIL	0.65	----	----	0.40
F 41132-022 (part)	US 131 from S of 10 Mile Rd N to Station 925 +00	L. W. Edison	Pits 41-46 & 41-48	Pit 41-46	NBOL	0.57	----	----	0.37
					NBIL	0.55	----	----	0.47
					SBOL	0.59	----	----	0.39
					SBIL	0.55	----	----	0.44

TABLE 6 (Cont.)
CONCRETE PAVEMENTS CONSTRUCTED IN 1969

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction			
			Coarse	Fine		1969	1970	1971	1974
F 41132-022 (part)	US 131 from Station 925+00 N to 14 Mile Rd	Carl Goodwin and Sons, Inc.	Pits 41-46 & 41-48	Pit 41-46	NBOL	----	0.44	----	----
					NBIL	----	0.61	----	----
					SBOL	----	0.43	----	----
					SBIL	----	0.61	----	----
USS 73081-004 U 73091-005	M 81 from 10th St E'ly and NE'ly on relocation to 25th St, City of Saginaw	W. F. McNally	Pit 17-40	Pit 79-73	EBOL	0.45	----	----	0.35
					EBCL	0.45	----	----	0.38
					EBIL	0.47	----	----	0.33
					WBOL	0.46	----	----	0.35
					WBCL	0.41	----	----	0.35
					WBIL	0.47	----	----	0.36
F 73131-001 (part)	M 83 from 300 ft N of Townline Rd NW'ly to S limits of Frankenmuth	Titus Construction Co.	Pit 17-66	Pit 63-54	NB	----	0.35	----	0.32
					SB	----	0.33	----	0.32
F 73131-001 (part)	M 83 from S limits to N limits of Frankenmuth omitting from 800 ft N of Cass River N to Genesee St	Titus Construction Co.	Pit 17-66	Pit 63-54	NBOL	----	0.45	----	0.49
					NBIL	----	0.37	----	0.36
					SBOL	----	0.41	----	0.50
					SBIL	----	0.39	----	0.35
I 73101-022	I 675 from I 75 W'ly to Saginaw City Limits	Sargent Construction Co.	Pit 71-47	Pit 79-73	EBOL	----	0.43	----	0.47
					EBIL	----	0.53	----	0.57
					WBOL	----	0.50	----	0.40
					WBIL	----	0.50	----	0.53
SS 76011-009 M 76011-010	M 52 (formerly M 47) comm. approximately 224 ft S of Bennington Rd, thence NE'ly to approximately 330 ft N of Krouse Rd, S of Owosso	Cooke Contracting Co.	Pit 19-48	Pit 19-48	NBOL	0.46	----	----	0.36
					NBIL	0.49	----	----	0.33
					SBOL	0.48	----	----	0.35
					SBIL	0.49	----	----	0.29
U 82081-021	M 153 (Ford Rd) from 620 ft E of M 39 (Southfield Rd) E'ly to 600 ft W of Greenfield Rd	T. Angelo Cement Construction Co.	E. C. Levy (Dix)	Pit 63-7	EBOL	----	0.49	----	0.33
					EB#3	----	0.40	----	0.37
					EB#2	----	0.42	----	0.35
					EBIL	----	0.50	----	0.34

TABLE 7
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1969

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction			
			Coarse	Fine		1969	1970	1971	1974
Mb 04032-007	US 23 from State Rd to bridge over Thunder Bay River	Alpena Paving Co.	Pit 79-21	Pit 04-29	NB	----	0.55	----	0.36
					SB	----	0.56	----	0.39
F 07013-004	US 41 from 400 ft S of old US 41 (N of Asinnins) N'ly to the Baraga-Houghton Co. Line	George Hocking Construction Co.	Pit 31-30	Isle Royal #4 Stamp Sand (Shore Sand-Houghton Location)	NB	0.63	----	----	0.79
					SB	0.63	----	----	0.79
Mb 12021-006	US 12 from Wright St to Avery Dr, City of Coldwater	John Yerington Co.	Material Services Corp., Chicago, Ill.	Pit 12-35	EBOL	----	0.37	----	0.32
					EBIL	----	0.37	----	0.33
					WBOL	----	0.31	----	0.31
					WBIL	----	0.37	----	0.33
Ms 19031-007	US 27 from 775 ft N of Northcrest Rd N'ly to 449 ft S of Clark Rd	Spartan Asphalt Paving Co.	Pit 47-3	Pit 47-43	NBOL	0.46	----	----	0.41
					NBIL	0.47	----	----	0.50
					SBOL	0.43	----	----	0.36
					SBIL	0.42	----	----	0.44
Mb 23011-005	M 78 from Barry-Eaton Co. Line NE'ly to West Village Limits of Bellevue	Rieth-Riley Construction Co., Inc.	Pit 39-1	Pits 13-30 & 13-79	EB	0.45	----	----	0.65
					WB	0.46	----	----	0.62
Ms 23042-009	M 43 (Saginaw St) from 1100 ft E of Creitz Rd E'ly to 340 ft E of Theo Ave	Rieth-Riley Construction Co., Inc.	Pit 47-3	Pit 23-92	EBOL	0.51	----	----	0.40
					EBIL	0.51	----	----	0.39
					WBOL	0.55	----	----	0.42
					WBIL	0.56	----	----	0.43
Mtb 25052-007	M 54 BR (Saginaw St) from Carpenter Rd (N City Limits of Flint) N'ly to the S City Limits of Mt. Morris	Flint Asphalt and Paving Co.	Pit 63-4	Pit 63-54	NBOL	0.53	----	----	0.35
					NBIL	0.55	----	----	0.37
					SBOL	0.55	----	----	0.37
					SBIL	0.57	----	----	0.39
Mtb 25052-008	M 54 BR (Saginaw St) from the S City Limits of Mt. Morris N'ly to M 54 (Dort Hwy)	Flint Asphalt and Paving Co.	Pit 47-3	Pit 63-54	NBOL	0.58	----	----	0.33
					NBIL	0.55	----	----	0.37
					SBOL	0.55	----	----	0.33
					SBIL	0.52	----	----	0.37
Ms 25072-011	M 54 (Dort Hwy) from 521 ft S of (Court St) N'ly to 100 ft N of (Davison Rd)	Flint Asphalt and Paving Co.	Pit 47-3	Pit 63-54	NBOL	----	0.40	----	0.44
					NBIL	----	0.43	----	0.46
					SBOL	----	0.41	----	0.44
					SBIL	----	0.46	----	0.48
Mb 25072-013	M 54 (Dort Hwy) from Carpenter Rd N'ly to 510 ft N of Mt. Morris Rd omitting 1185 ft at Carpenter Rd	Spartan Asphalt Paving Co.	Pit 47-3	Pit 63-54	NBOL	----	0.50	----	0.37
					NBIL	----	0.58	----	0.42
					SBOL	----	0.51	----	0.38
					SBIL	----	0.59	----	0.44

TABLE 7 (Cont.)
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1969

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction			
			Coarse	Fine		1969	1970	1971	1974
Mb 25081-008	M 21 (Court St) from 274 W of Ann Arbor St E'ly to M 54 BR (Saginaw St)	Spartan Asphalt Paving Co.	Pit 47-3	Pit 63-54	EBOL	0.44	----	----	0.35
					EBIL	0.43	----	----	0.44
					WBOL	0.41	----	----	0.37
					WBIL	0.42	----	----	0.36
Mb 31012-005[1] (part 1 of 2)	M 26 from Co. Rd #540 (Kearsarge in Painesdale) NE'ly to Dollar Bay Rd, omitting cities of Houghton and Hancock	Mathy Construction Co. LaCrosse, Wisconsin	Pit 31-63	Isle Royal #4 Stamp Sand (Shore Sand-Houghton Location)	NB	0.62	----	----	0.55
					SB	0.57	----	----	0.59
F 33021-003 F 33092-001	M 52 comm. 500 ft S of M 36 eastbound (Topping Rd) thence N to I 96	Howell Construction Co.	Pit 47-3	Pit 47-26	NB	0.60	----	----	0.50
					SB	0.60	----	----	0.55
Mb 36051-001	US 2 and US 41 from state line N to M 69 in Crystal Falls	Payne and Dolan of Wisconsin, Inc.	Pit 36-10	Pit 36-10	NB	0.53	----	----	0.64
					SB	0.48	----	----	0.61
F 41012-006	M 44 connector (Plainfield Ave) from I 96 NE'ly to Airway St., City of Grand Rapids	Rieth-Riley Construction Co., Inc.	Pit 41-46	Pit 41-113	NBOL	----	0.55	----	0.50
					NBIL	----	0.62	----	0.49
					SBOL	----	0.55	----	0.42
					SBIL	----	0.57	----	0.44
Mcr 41051-007	M 44 from 345 ft S of Cascade Rd N'ly intermittently to 250 ft N of Knapp St	Woodland Paving Co., Inc.	Pit 41-38	Pit 41-27	NB	0.37	----	----	0.44
					SB	0.38	----	----	0.44
F 41122-006	M 57 from US 131 relocation E'ly to Toft Ave	Rieth-Riley Construction Co., Inc.	Pit 41-46	Pit 41-113	EB	----	0.56	----	0.52
					WB	----	0.57	----	0.49
Mb 50092-005	M 19 from a point N of New Haven Rd thence N'ly to N of Main St in Village of Muttonville	Detroit Concrete Products Corp.	Pit 50-35	Pit 50-35	NB	0.49	----	----	0.46
					SB	0.48	----	----	0.45
Ms 61022-006	M 46 (Miller Ave and Apple Ave) from US 31 BR (Muskegon Ave) E'ly to Getty St, City of Muskegon	Rieth-Riley Construction Co., Inc.	Pit 70-9	Pit 70-9	EBOL	----	0.57	----	0.40
					EBIL	----	0.58	----	0.36
					WBOL	----	0.55	----	0.40
					WBIL	----	0.59	----	0.40
Mb 63031-027	US 24 (Telegraph Rd) from N of Maple Rd N'ly to S of Long Lake Rd	A and A Asphalt Paving Co.	Pit 63-4	Pit 63-4	NBOL	----	----	0.43	0.38
					NBIL	----	----	0.49	0.41
					SBOL	----	----	0.48	0.38
					SBIL	----	----	0.54	0.42
Mb 63051-031 Ms 63051-032	US 10 (Woodward Ave) from 290 ft SE of I 75 BL (Square Lake Rd) SE'ly to 75 ft SE of Oakland Ave	Ajax Asphalt Paving, Inc.	Pit 63-4	Pit 63-4	SBOL	----	0.45	----	0.51
					SB#3	----	0.46	----	0.53
					SB#2	----	0.54	----	0.54
					SBIL	----	0.57	----	0.55

[1] Part 2 of 2 is a Bit Agg project--See Table 8.

TABLE 7 (Cont.)
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1969

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction			
			Coarse	Fine		1969	1970	1971	1974
Mb 78012-004 (part 1 of 2)	US 131 from US 12 N'ly to M 60 omitting 0.82 miles in Village of Constantine	Rieth-Riley Construction Co., Inc.	Pit 39-1	Pit 78-25	NB	0.44	----	----	0.46
					SB	0.43	----	----	0.48
Mb 78012-004 (part 2 of 2)	US 131 BL from Portage St in City of Three Rivers N'ly to US 131	Globe Construction Co.	Pit 39-1	Pit 39-4	NB	0.44	----	----	0.42
					SB	0.47	----	----	0.41
Mb 78021-001	US 12 from Mann Rd E'ly to 200 ft E of Penn Central RR Crossing, omitting from US 131 E'ly to 430 ft E of E Village Limits of White Pigeon	Rieth-Riley Construction Co., Inc.	Pit 39-1	Pit 78-25	EB	----	0.48	----	0.45
					WB	----	0.50	----	0.48
Ms 81032-009	US 12 at Carpenter Rd	Ann Arbor Construction Co.	Pit 47-3	Pit 47-3	EBOL	----	----	0.48	0.37
					EBIL	----	----	0.48	0.42
					WBOL	----	----	0.50	0.42
					WBIL	----	----	0.47	0.36
M 82021-018	I 94 comm. 0.588 mi W of the Wayne-Washtenaw Co. Line thence E'ly 7.859 mi	Cooke Contracting Co.	Pit 47-3	Pit 47-3	EBOL	0.33	----	----	0.33
					EBIL	0.35	----	----	0.40
					WBOL	0.35	----	----	0.34
					WBIL	0.47	----	----	0.42
U 82081-021	M 153 (Ford Rd) from 620 ft E of M 39 (Southfield Rd) E'ly to 600 ft W of Greenfield Rd	Cooke Contracting Co.	Pit 50-35	Pit 50-35	WBOL	----	0.60	----	0.49
					WB#3	----	0.55	----	0.47
					WB#2	----	0.58	----	0.50
					WBIL	----	0.59	----	0.55
Mb 82131-011 (part 1 of 2)	US 10 (Woodward Ave) comm. at Clairmount St, thence NW'ly to Tuxedo St	Detroit Asphalt Paving Co.	Pit 47-3	Pit 50-41	NBOL	0.45	----	----	0.40
					NBIL	0.48	----	----	0.41
					SBOL	0.45	----	----	0.42
					SBIL	0.48	----	----	0.42
Mb 82131-011 (part 2 of 2)	US 10 comm. at 6 Mile Rd (McNichols Rd) thence NW'ly to approximately 700 ft SE of 8 Mile Rd	Detroit Asphalt Paving Co.	Pit 47-3	Pit 50-41	NBOL	0.48	----	----	0.37
					NB#4	0.49	----	----	0.36
					NB#3	0.50	----	----	0.40
					NB#2	0.58	----	----	0.41
					NBIL	0.63	----	----	0.37
					SBOL	0.50	----	----	0.46
					SB#4	0.51	----	----	0.42
					SB#3	0.47	----	----	0.35
					SB#2	0.52	----	----	0.34
					SBIL	0.53	----	----	0.33
Group Mm 9 BC-6A	EB M 78 from Clinton-Shiawassee Co. Line NE'ly 5.1 mi and on WB M 78 from M 47 SW'ly 2.2 mi in Shiawassee Co.	Spartan Asphalt Paving Co.	Pit 41-38	Pit 76-43	EBOL	0.45	----	----	0.45
					EBIL	0.54	----	----	0.55
					WBOL	0.43	----	----	0.42
					WBIL	0.53	----	----	0.61

TABLE 8
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1969

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1969	1970	1974
Mb 07041-006	M 38 from 550 ft E of Co. Rd #651 (Pelke Rd) E'ly to 0.3 mi E of E Limits of Baraga	Fox Valley Construction Company	07-46 & 07-44	07-46 & 07-44	EB WB	0.53 0.55	---- ----	0.73 0.71
SS 17072-004	M 129 comm. at Tone Rd, thence N'ly to Dafter Rd	Hodgkiss and Douma	17-72	17-72	NB SB	0.61 0.59	---- ----	0.66 0.64
Mb 31012-005[1] (Part 2 of 2)	M 203 from Calumet S'ly to US 41	Mathy Construction Company	31-63	Isle Royal #4 Stamp Sand (Shore Sand-Houghton Location)	NB SB	0.61 0.61	---- ----	0.54 0.57
Mb 41071-001	M 50 (Alden Nash Rd) from 84th St N'ly to 1770 ft S of I 96	Rieth-Riley Construction Co., Inc.	41-46	---	NB SB	---- ----	0.57 0.60	0.43 0.46
SS 45041-003	M 204 from M 22 E'ly to County Rd 641	Peninsula Asphalt Corporation	45-19	---	EB WB	---- ----	0.42 0.42	0.35 0.37
Mb 48042-004	M 28 from 0.61 mi E of M 117 to Luce-Chippewa Co. Line also on M 28 0.5 mi and 2.0 mi E of Luce-Chippewa Co. Line	George Hocking Construction Company	48-6	48-6	EB WB	0.45 0.42	---- ----	0.63 0.63
M 52031-005	M 35 from SE of Village of Little Lake W'ly to abandoned RR in New Swanzy	Payne and Dolan of Wisconsin, Inc.	52-9	---	NB SB	0.46 0.47	---- ----	0.57 0.54
Mb 57011-003	M 66 from Osceola-Missaukee Co. Line N'ly and W'ly to M 42 omit from WB M 55 to EB M 55	The Hicks Company	57-29 & 57-2	57-29 & 57-2	NB SB	0.33 0.37	---- ----	0.48 0.47
SS 62014-001	On proposed M 20 comm. at M 82 in Hesperia E;ly to Crosswell Ave	Rieth-Riley Construction Co., Inc.	62-54	---	EB WB	0.47 0.47	---- ----	0.52 0.53
Mb 65052-005	M 33 from 210 ft N of M 55 N'ly to 503 ft N of S City Limits of Rose City	Central Paving Company	65-46 & 65-52	---	NB SB	---- ----	0.57 0.61	0.43 0.48
Mb 67032-003 (Part 1 of 2)	M 66 from M 115 N'ly to Osceola-Missaukee Co. Line	Rieth-Riley Construction Co., Inc.	54-40	54-40	NB SB	0.28 0.25	---- ----	0.52 0.51
Mb 67032-003 (Part 2 of 2)	M 115 1.5 mi SE of M 66 and 1.0 mi NW of M 61	Rieth-Riley Construction Co., Inc.	54-40	54-40	EB WB	0.39 0.44	---- ----	0.49 0.49
Mb 68011-004	M 33 from 1894 ft S of Ogemaw-Oscoda Co. Line, N'ly 10 miles to Mio	Central Paving Company	65-52	---	NB SB	---- ----	0.65 0.63	0.42 0.43

[1]Part 1 of 2 is a Bit Conc project--See Table 7.

TABLE 9
MISCELLANEOUS BITUMINOUS SURFACES CONSTRUCTED IN 1969

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1969	1970	1974
NSST (Single and Double)								
Mm OSC-6A	M 90 from Brown City E'ly to M 19	C. R. Hunt Construction Company	63-54	---	EB	-----	0.60	0.64
					WB	-----	0.61	0.65
Mm OSC-7A	M 89 from 27th St E'ly to M 43	Rieth-Riley Construction Co., Inc.	03-34	---	EB	-----	0.56	0.56
					WB	-----	0.55	0.50
Mm 9SC-7C	M 79 from W City Limits of Charlotte W'ly 4.2 miles, Calhoun and Eaton Counties	Spartan Asphalt Paving Company	12-31	---	EB	0.53	-----	0.40
					WB	0.54	-----	0.45
Mm 9SC-9A	M 154 from Ferry landing, S'ly to Bates Highway on Harsens Island in St. Clair County	Sheldon Contractors, Inc.	47-3	---	NB	0.63	-----	0.36
					SB	0.63	-----	0.37
Stone Filled Sand Asphalt and Similar Surfaces								
Ms 11013-010	I 94 BL (Main St) from NB M 139 (Paw Paw Ave) E'ly to SB M 139 (Fair Ave) Berrien County	John G. Yerington Company	Material Service, Thornton, Ill.	11-30	EBOL	0.42	----	0.48
					EBIL	0.42	----	0.47
					WBOL	0.39	----	0.47
					WBIL	0.40	----	0.46
Mb 38071-010	M 50 from 2400 ft E of Hand Rd in Lenawee County, W'ly and N'ly to Stoney Lake Rd, in Jackson County, omitting at US 12 and at divided roadway in Village of Brooklyn	Rieth-Riley Construction Co., Inc.	47-3	42-28	NB	----	0.64	0.44
					SB	----	0.67	0.45
Mb 46061-011 (Part 1 of 2)	US 223 BR (Maumee and Church St) at W Limits in Adrian	Ayling-Cunningham Asphalt Paving Co., et al	France Stone Waterville, Ohio	46-28	EB	----	0.58	0.35
					WB	----	0.54	0.37
Mb 46061-011 (Part 2 of 2)	M 52 and US 223 BR W from Nelson St S to Merrick St in Adrian	Ayling-Cunningham Asphalt Paving Co., et al	France Stone Waterville, Ohio	46-28	NBOL	----	0.56	0.32
					NBIL	----	0.54	0.40
					SBOL	----	0.55	0.35
					SBIL	----	0.58	0.42

TABLE 9 (Cont.)
MISCELLANEOUS BITUMINOUS SURFACES CONSTRUCTED IN 1969

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1969	1970	1974
Stone Filled Sand Asphalt and Similar Surfaces (Cont.)								
Mb 45101-007	US 12 from 150 ft E of Pentecost Highway E to Lenawee-Washtenaw County Line omitting from 350 ft E of Raisin River in Clinton E'ly to E Village Limits of Clinton	Ayling-Cunningham Asphalt Paving Co., et al	France Stone Waterville, Ohio	46-28	EB WB	0.44 0.43	---- ----	0.41 0.42
Ms 63052-021	US 10 (SB outside lane only) from 2361 ft NW of, to 784 ft SE of Bataan Rd	Lake and Howell Construction Company	47-3	47-26	SBOL	----	0.53	0.40
Ms 69014-012	SB I 75 from 2400 ft N of Old US 27 N'ly 2800 ft (N of Vanderbilt)	Lake and Howell Construction Company	71-15	72-5	SBOL SBIL	0.48 0.52	---- ----	0.47 0.51
Mb 75021-010	US 2 from M 149 to E City Limits of Manistique	Lake and Howell Construction Company	75-5	70-9	EB WB	0.43 0.44	---- ----	0.56 0.58
Mb 76041-006 (Part 1 of 2)	M 21 (Main St) from W City Limits of Owosso (Chestnut St) E'ly to E City Limits of Owosso (Gould St) omitting from Shiawassee River to Ball St	Saginaw Asphalt Paving Company	17-40	73-5	EBOL EBIL WBOL WBIL	0.41 0.44 0.42 0.44	---- ---- ---- ----	0.45 0.45 0.47 0.47
Mb 76041-006 (Part 2 of 2)	M 71 (Corunna St) from Washington St in Owosso SE'ly and S'ly to intersection of Shiawassee St and McNeil St in Corunna	Saginaw Asphalt Paving Company	17-40	73-5	NBOL NBIL SBOL SBIL	0.43 0.46 0.45 0.46	---- ---- ---- ----	0.46 0.45 0.48 0.47
Mb 79031-007	M 15 (State St) from 400 ft N of S Village Limits of Millington N'ly to 300 ft N of Ellis Rd, Village of Millington	Saginaw Asphalt Paving Company	75-5	79-8	NB SB	0.46 0.46	---- ----	0.39 0.40

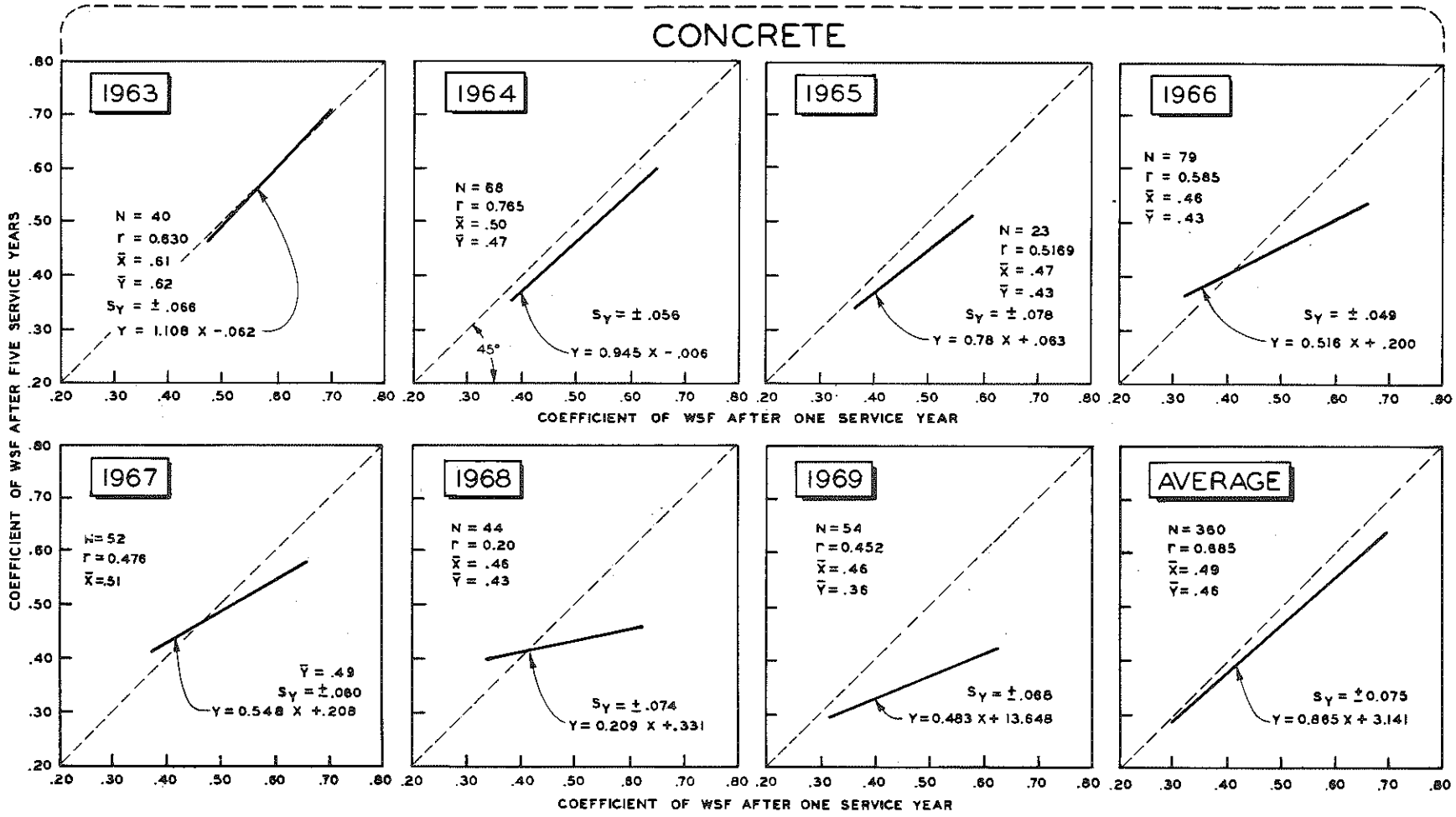


Figure 1. Relationship between one- and five-year wet sliding friction for concrete pavements.

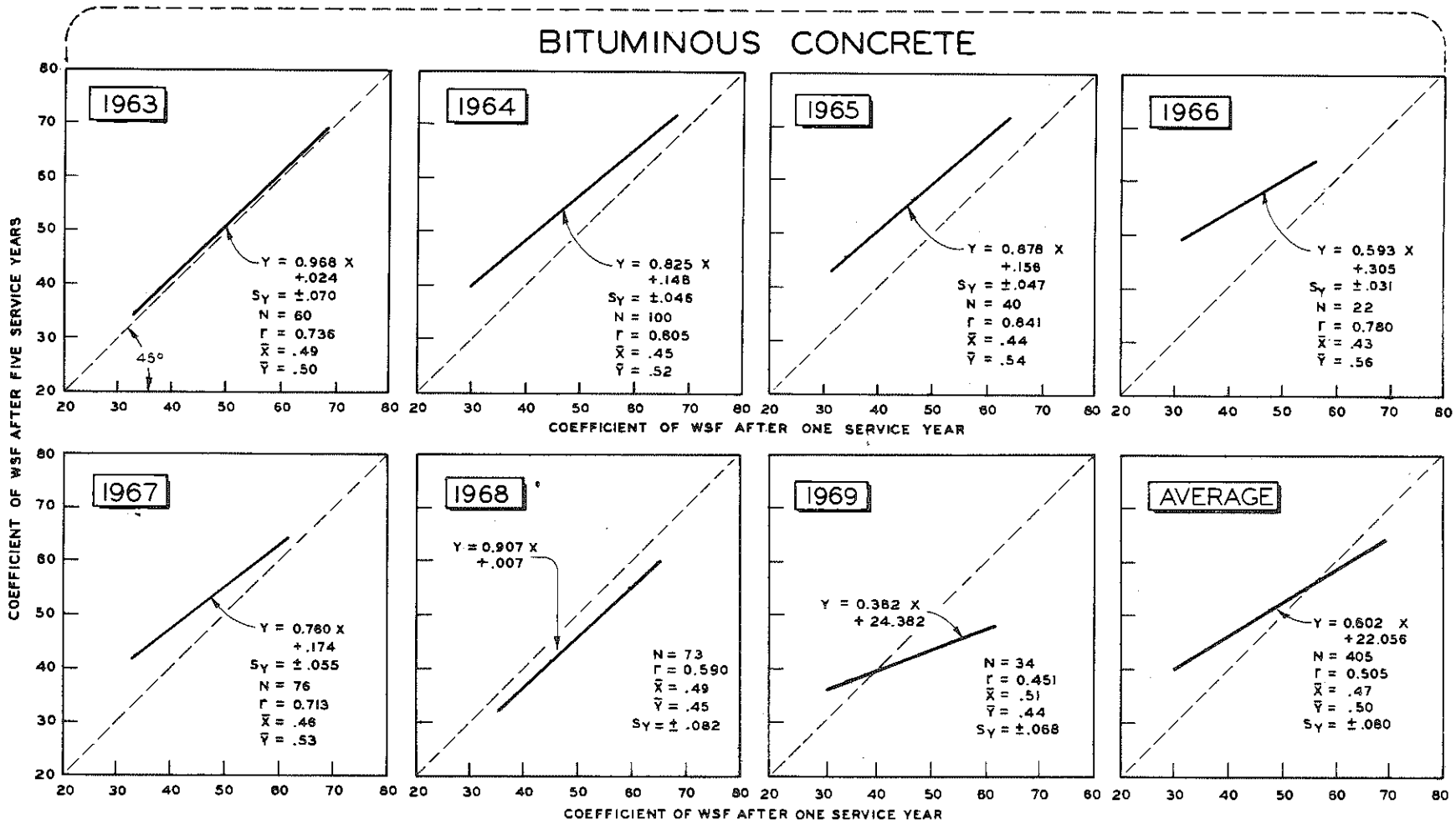


Figure 2. Relationship between one- and five-year wet sliding friction for bituminous concrete pavements.

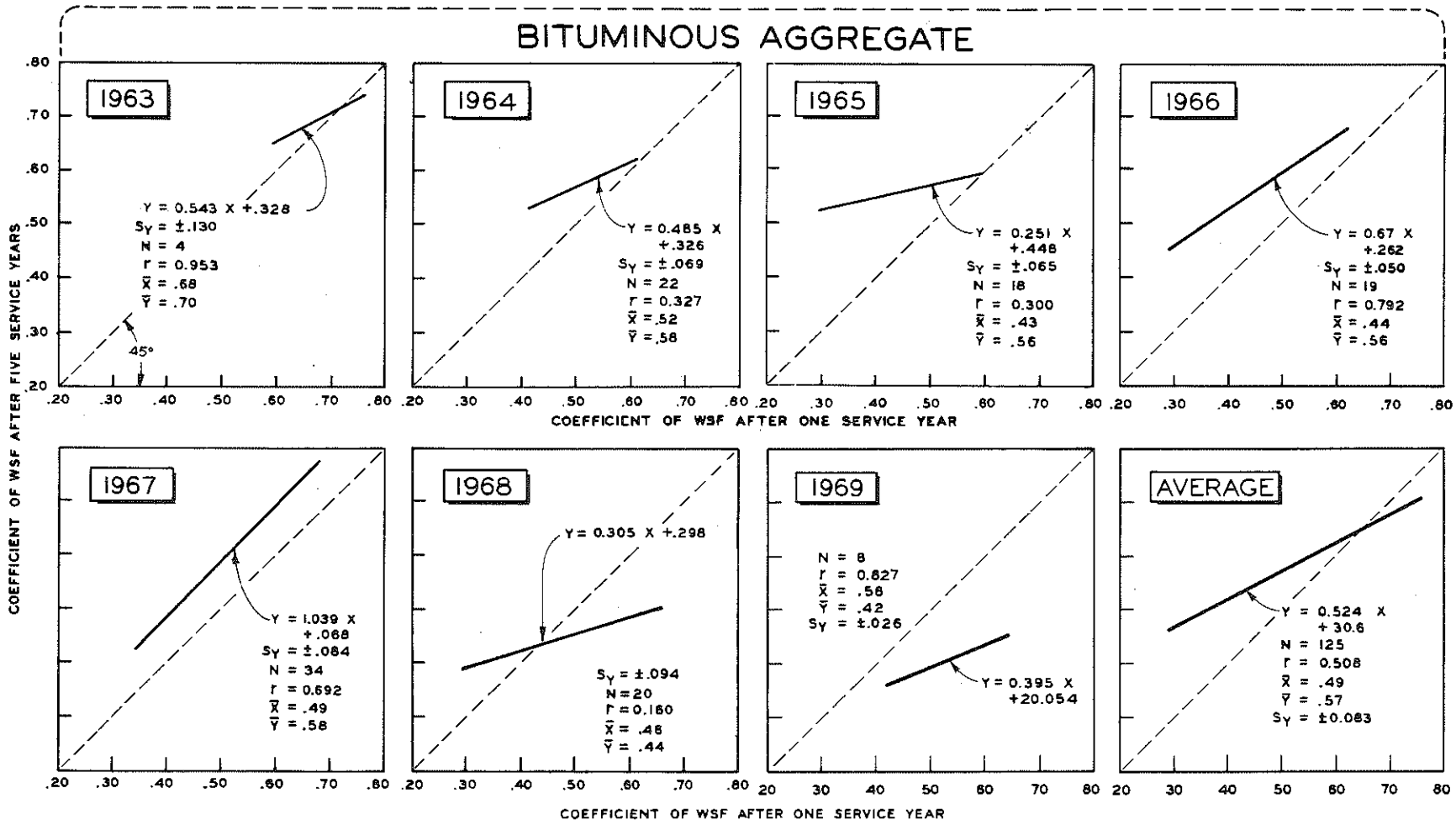


Figure 3. Relationship between one- and five-year wet sliding friction for bituminous aggregate pavements.

SECTION III

FRICTION LEVELS DETERMINED FOR PAVEMENTS AFTER TEN YEARS OF SERVICE

Friction Levels Determined for Pavements After Ten Years of Service

A historical review of coefficients after 10 years of service has been made on 101 trunkline projects. Two hundred twenty-one lanes of concrete or bituminous pavement were skid tested at the 10-year service level during 1974 and the results are contained in Tables 10 through 12.

Table 10 - Ten-Year Wsf Review for Concrete Pavements

The 99 lanes, 250.768 lane miles of concrete pavements, tested after a 10-year service period, yielded friction levels which ranged from 0.22 to 0.60 and averaged 0.42. Average coefficients on 49 percent of the lane mileage were below 0.40. The lowest values encountered at the 10-year level were on Projects 33061D, C11 and 33061E, C12, located on westbound M 43 from Center St west to Logan St in Lansing. Friction levels on these projects ranged from 0.22 to 0.30 and averaged 0.26. They represent less than 1 percent of the total 10-year lane mileage.

Table 11 - Ten-Year Wsf Review for Bituminous Concrete Pavements

One-hundred lanes (396.023 lane miles) of bituminous concrete pavement were skid tested during 1974, after a 10-year service period. Average Wsf values ranged from 0.34 to 0.76 and averaged 0.48. Eighteen percent of the lane mileage tested resulted in friction levels lower than 0.40. Two projects yielded outstanding coefficients, with Wsf values on all lanes tested averaging above 0.70. These projects were 31051A, C11, located on US 41 from Baraga-Houghton County line northwest to the Snake River and 52043A, C5, on US 41 from 3.5 miles northwest of the Alger-Marquette County line northwest to northwest of M 94.

Table 12 - Ten-Year Wsf Review for Bituminous Aggregate Pavements

An average Wsf of 0.54 was determined on bituminous aggregates after 10 years of service. Coefficients ranged from 0.30 to 0.67. Only one of the 22 lanes measured fell below the 0.40 mark.

TABLE 10
CONCRETE PAVEMENTS CONSTRUCTED IN 1964

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction					
			Coarse	Fine		1965	1966	1967	1969	1970	1974
BI 03034B, C9	I 196 from N of Adams Rd N to Washington Rd	Carl Goodwin and Sons, Inc.	Pits 3-65, 17-40 & 70-9	Pits 3-47 & 3-65	NBOL	0.55	----	----	0.56	----	0.46
					NBIL	0.59	----	----	0.69	----	0.61
					SBOL	0.55	----	----	0.53	----	0.42
					SBIL	0.60	----	----	0.66	----	0.64
F 13121B, C1	I 94 BL from Columbia Ave NE to Dickman Rd	Titus Construction Co.	Pit 8-80	Pit 8-5	NB	0.56	----	----	0.52	----	0.37
					SB	0.54	----	----	0.47	----	0.34
U 13121E, C2	I 94 BL from 20th St in Springfield E to Upton Ave in Battle Creek	Titus Construction Co.	Pits 8-20 & 8-80	Pit 8-5	EBOL	0.42	----	----	0.31	----	0.30
U 13121E, C3					EBIL	0.47	----	----	0.34	----	0.30
U 33061D, C11	M 43 WB from Center St W to Logan St in Lansing	Eisenhour Construction Co., Inc.	Pit 47-3	Pit 33-6	WBOL	----	0.43	----	0.35	----	0.22
U 33061E, C12					WBCL	----	0.42	----	0.36	----	0.30
					WBIL	----	0.41	----	0.37	----	0.27
F 39051B, C6	US 131 BR from US 131 (S of "G" Ave) E to N limits of Kalamazoo	Sargent Construction Co.	Pit 3-44	Pit 3-44	EBOL	0.65	----	----	0.61	----	0.43
					EBIL	0.65	----	----	0.70	----	0.50
					WBOL	0.59	----	----	0.51	----	0.39
					WBIL	0.65	----	----	0.69	----	0.49
I 41027A, C24	I 196 from Fuller Ave SW to Turner Ave	Carl Goodwin and Sons, Inc.	Pit 41-46	Pit 41-46	NEBOL	0.50	----	----	0.42	----	0.36
I 41027D, C56					NEBCL	0.50	----	----	0.42	----	0.37
I 41027E, C58					NEBIL	0.51	----	----	0.46	----	0.40
I 41027A, C163					SWBOL	0.49	----	----	0.43	----	0.36
I 41027B, C164					SWBCL	0.49	----	----	----	----	----
I 41029E, C1					SWBIL	0.51	----	----	0.46	----	0.41
I 41029F, C6											
I 41029F, C8											
I 41029E, C3	I 196 from 0.762 mi SW of Wyoming NE to the Grand River in Grand Rapids	L. W. Edison	Pit 41-16	Pit 41-16	NBOL	0.47	----	----	0.40	----	0.39
I 41029D, C37					NBIL	0.52	----	----	0.48	----	0.39
I 41029B, C54					SBOL	0.50	----	----	0.39	----	0.38
					SBIL	0.51	----	----	0.47	----	0.39
I 41029A, C35	I 196 from the Ottawa-Kent Co. Line NE to 0.762 mi SW of Wyoming	L. W. Edison	Pit 41-16	Pit 41-16	NBOL	0.51	----	----	0.39	----	0.37
I 41029B, C36					NBIL	0.54	----	----	0.46	----	0.39
					SBOL	0.51	----	----	0.39	----	0.36
					SBIL	0.54	----	----	0.40	----	0.37
Mb 50091A, C2	M 19 from I 94 NW to the St. Clair-Macomb County Line	Anderson and Ruzzin, Inc.	E. C. Levy (Dix Yd.)	Pit 50-35	EB	0.58	----	----	0.51	----	0.38
F 50092A, C1					WB	0.58	----	----	0.51	----	0.40

TABLE 10 (Cont.)
CONCRETE PAVEMENTS CONSTRUCTED IN 1964

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction					
			Coarse	Fine		1965	1966	1967	1969	1970	1974
BI 50111H, C11	I 94 from N of 14 Mile Rd N to Clinton River Spillway	Cooke Contracting Co.	E. C. Levy (Dix Yd.)	Pit 50-21	NBOL	0.47	----	----	0.43	----	0.48
					NBCL	0.53	----	----	0.51	----	0.53
					NBIL	0.58	----	----	0.57	----	0.50
					SBOL	0.44	----	----	0.41	----	0.45
					SBCL	0.53	----	----	0.46	----	0.51
					SBIL	0.55	----	----	0.52	----	0.55
BI 50111G, C41	I 94 from Masonic Blvd N to N of 14 Mile Rd, St. Clair Shores	Cooke Contracting Co.	Pit 63-4 & E. C. Levy (Dix Yd.)	Pits 50-21 & 63-4	NBOL	0.45	----	----	0.40	----	0.44
					NBCL	0.45	----	----	0.44	----	0.47
					NBIL	0.53	----	----	0.45	----	0.49
					SBOL	0.47	----	----	0.41	----	0.44
					SBCL	0.49	----	----	0.47	----	0.47
					SBIL	0.57	----	----	0.43	----	0.51
F 52043B, C4	US 41 from NW of M 94 NW to Green Garden Hill Rd (omitting 0.47 mi at the Chocolay River)	L. W. Brumm	Pits 52-38 & 52-39	Pit 52-9	NB	0.58	----	----	0.50	----	0.50
					SB	0.59	----	----	0.54	----	0.45
F 62031C, C10	M 37 - M 46 from S of S Limits of Newaygo N to Wood St in Newaygo	Eisenhour Construction Co., Inc.	Pit 67-2	Pits 62-16 & 67-2	NBOL	0.46	----	----	0.37	----	0.31
					NBIL	----	----	----	0.33	----	----
					SBOL	0.43	----	----	0.39	----	0.34
					SBIL	----	----	----	0.34	----	----
F 63041E, C7	M 59 from Airport Rd to Elizabeth Lake Rd	Eisenhour Construction Co., Inc. and T. A. Forsberg, Inc.	Pit 63-54	Pit 63-54	EBOL	0.38	----	----	0.31	----	0.33
					EBIL	0.42	----	----	0.33	----	0.34
					WBOL	0.38	----	----	0.33	----	0.35
					WBIL	0.42	----	----	0.32	----	0.35
EBBU 63081B, C2	I 696 from SE of M 39 NW to Lee Baker Rd	The Kutchins Co.	E. C. Levy (Dix Yd.)	Pit 63-7	NBOL	0.39	----	----	0.46	----	0.39
					NBIL	0.42	----	----	0.49	----	0.47
					SBOL	0.38	----	----	0.43	----	0.38
					SBIL	0.41	----	----	0.44	----	0.45
EBBU 63081A, C9	I 696 from Northland Drive to Winona St	The Kutchins Co.	E. C. Levy (Dix Yd.)	Pit 63-7	NBOL	0.42	----	----	0.40	----	0.42
					NBCL	0.42	----	----	0.46	----	0.43
					NBIL	0.44	----	----	0.48	----	0.46
					SBOL	0.39	----	----	0.40	----	0.39
					SBCL	0.42	----	----	0.44	----	0.46
					SBIL	0.45	----	----	0.46	----	0.45

TABLE 10 (Cont.)
CONCRETE PAVEMENTS CONSTRUCTED IN 1964

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction					
			Coarse	Fine		1965	1966	1967	1969	1970	1974
M 63201B, C1	M 59 (Widetrack Dr) from intersection of Cass St and Huron St, SE to S of Wesson St in Pontiac	Anderson and Ruzzin, Inc.	E. C. Levy (Dix Yd.)	Pit 63-56	OL	----	0.32	----	0.35	----	0.40
					#4	----	0.31	----	0.36	----	0.38
					#3	----	0.35	----	0.37	----	0.38
					#2	----	0.41	----	0.45	----	0.40
					IL	----	0.36	----	0.35	----	0.38
SS 73031C, C7 USS 76012A, C1 SS 76012B, C2	M 52 from intersection of M 21 in Owosso N to 5th St in Oakley	Sargent Construction Co.	Pit 47-3	Pit 76-36	NBOL	----	----	0.36	----	0.34	0.38
					SBOL	----	----	0.43	----	0.36	0.34
BI 77111E, C5 BI 77111F, C6	I 94 from N of Gratiot N and NE to N of Griswold Rd	Sargent Construction Co.	Pit 75-5	Pit 50-26	NBOL	0.54	----	----	0.47	----	0.52
					NBIL	0.56	----	----	0.60	----	0.59
					SBOL	0.52	----	----	0.45	----	0.50
					SBIL	0.57	----	----	0.59	----	0.60
BI 77111G, C7 BI 77111H, C8	I 94 from N of Griswold Rd NE to N of Water St	Sargent Construction Co.	Pits 17-40 & 75-5	Pits 50-26 & 74-51	NBOL	0.51	----	----	0.49	----	0.54
					NBIL	0.53	----	----	0.57	----	0.59
					SBOL	0.48	----	----	0.43	----	0.47
					SBIL	0.52	----	----	0.56	----	0.54
F 81103B, C7	M 14 from US 23 to Plymouth Rd	L. A. Davidson	Pit 47-3	Pit 47-3	EBOL	----	0.53	----	0.48	----	0.35
					EBIL	----	0.56	----	0.63	----	0.40
					WBOL	----	0.44	----	0.42	----	0.32
					WBIL	----	0.51	----	0.55	----	0.35
F 81121A, C2	M 153 relocation from intersection of M 14 relocation and existing M 14, SE to intersection of Franks Lake Rd and existing M 153 (Ford Rd)	Eisenhour Construction Co., Inc.	Pits 81-1 & 81-57	Pits 81-1 & 81-57	NWBOL	----	0.42	----	0.55	----	0.34
					NWBIL	----	0.45	----	0.58	----	0.49
					SEBOL	----	0.44	----	0.48	----	0.34
					SEBIL	----	0.48	----	0.61	----	0.44
F 82052G, C25	US 24 from Eureka St N to Haskell St	Cooke Contracting Co.	E. C. Levy (Trenton Yd.)	Pit 82-10	SBOL	0.38	----	----	0.41	----	0.34
					SBCL	0.42	----	----	0.44	----	0.37
					SBIL	0.41	----	----	0.40	----	0.37
U 82192B, C21	M 39 from S of Outer Drive to N of South Dearborn Rd	L. A. Davidson	E. C. Levy (Trenton Yd.)	Pit 63-7	NBOL	----	0.30	----	0.37	----	0.35
					NBCL	----	0.36	----	0.40	----	0.37
					NBIL	----	0.37	----	0.43	----	0.38
					SBOL	----	0.33	----	0.38	----	0.35
					SBCL	----	0.36	----	0.38	----	0.37
					SBIL	----	0.40	----	0.44	----	0.41

TABLE 11
BITUMINOUS CONCRETE PAVEMENT (4.12) CONSTRUCTED IN 1964

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction				
			Coarse	Fine		1964	1965	1966	1969	1974
F 06073C, C1 F 06073C, C2 F 06073C, C3	US 23 from W of M 65 E and N to the Iosco-Arenac Co. Line, omitting that portion between Michigan Ave and Water St in AuGres	Sargent Construction Co.	Pit 17-40	Pit 71-15 & Local pits	EB WB	---- ----	0.47 0.46	---- ----	0.58 0.59	0.53 0.54
F 08031C, C5	M 37 from S of Quimby Rd N to S of Starr Rd	Globe Construction Co.	Pit 8-49	Pit 8-58	NB SB	---- ----	0.45 0.42	---- ----	0.50 0.50	0.44 0.45
SS 08041A, C10	M 79 from S of Starr Rd E to E of Barryville Rd	Globe Construction Co.	Pit 8-49	Pit 8-58	EB WB	---- ----	0.46 0.52	---- ----	0.62 0.64	0.54 0.57
U 09032C, C9	M 13 from S of Union St N to N of Wilder Rd	Carrollton Paving Co., Inc.	Pit 17-40	Pit 25-8	NBOL NBIL SBOL SBIL	---- ---- ---- ----	0.30 0.36 0.35 0.32	---- ---- ---- ----	0.46 0.50 0.45 0.51	0.36 0.43 0.38 0.46
Mb 11011C, C5	US 12 from Indiana-Michigan State Line NE to NE of New Buffalo	John G. Yerington Co.	Material Services Corp., Chicago, Ill.	Local pits	NBOL NBIL SBOL SBIL	---- ---- ---- ----	0.31 0.39 0.33 0.42	---- ---- ---- ----	0.34 0.53 0.42 0.44	0.39 0.55 0.37 0.46
F 11051A, C4	US 31 from Indiana-Michigan State Line N to M 60	Klett Construction Co.	Material Services Corp., Chicago, Ill.	Pit 14-45	NBOL NBIL SBOL SBIL	---- ---- ---- ----	0.42 0.48 0.41 0.48	---- ---- ---- ----	0.46 0.52 0.47 0.51	0.36 0.50 0.38 0.47
U 13121E, C2 U 13121E, C3	I 94 BL from 20th St in Springfield E'ly to Upton Ave in Battle Creek	Rieth-Riley Construction Co., Inc.	Pit 39-1	Pit 13-38	WBOL WBIL	---- ----	0.43 0.48	---- ----	0.50 0.53	0.44 0.46
F 17062C, C2	M 28 from 2.3 mi E of Strongs Rd E to 1 mi W of the Demond Hill Fire Tower (E and W of Raco)	Hodgkiss and Douma, Inc.	Pit 75-5	Local pit	EB WB	---- ----	0.54 0.54	---- ----	0.49 0.49	0.55 0.54
F 30033C, C1	M 99 from N limits of Jonesville NW to E limits of Litchfield	Yerington and Brown, Inc.	Pit 12-35	National Lime and Stone Co., Findley, Ohio	NB SB	---- ----	---- ----	0.47 0.47	0.58 0.61	0.41 0.40
F 31051A, C11	US 41 from Baraga-Houghton Co. Line NW to the Snake River	Thornton Construction Co.	Pit 31-45	Pit 31-45	NB SB	---- ----	0.60 0.60	---- ----	0.66 0.66	0.76 0.74
F 32091C, C1	US 25 from 500 ft S of Helena Rd N to 1,035 ft N of S limits of Harbor Beach	Lake and Howell Construction Co.	Pit 32-6 & Local pit	Pit 32-4	NB SB	---- ----	---- ----	0.49 0.48	0.54 0.54	0.49 0.48
Mb 34062C, C2	M 21 from Dexter St E to E limits of Ionia	Rieth-Riley Construction Co., Inc.	Pit 41-46	Pit 41-46	EB WB	---- ----	0.41 0.37	---- ----	0.49 0.49	0.38 0.38

TABLE 11 (Cont.)
BITUMINOUS CONCRETE PAVEMENT (4.12) CONSTRUCTED IN 1964

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction				
			Coarse	Fine		1964	1965	1966	1969	1974
F 35031C, C1	US 23 from Arenac-Iosco Co. Line N to W limits of Tawas City	Saginaw Asphalt Paving Co.	Pit 17-40	Local pits	NB	----	0.45	----	0.52	0.49
					SB	----	0.42	----	0.52	0.51
F 35032C, C7	US 23 from E limits of Tawas City N to Mill St	Rieth-Riley Construction Co., Inc.	Pit 71-15	Pit 71-15	NB	----	0.47	----	0.54	0.45
					SB	----	0.44	----	0.54	0.44
F 35032C, C8	US 23 from Old M 171, N of Oscoda, N to the Iosco-Alcona Co. Line	Parmalee and Carpenter	Pit 71-15	Pit 01-56	NB	0.26	----	----	0.46	0.52
					SB	0.28	----	----	0.44	0.46
F 35032C, C9	US 23 from E to W limits of Tawas City	Saginaw Asphalt Paving Co.	Pit 17-40	Local pits	EBOL	----	0.40	----	0.46	0.46
					EBIL	----	0.44	----	0.55	0.52
					WBOL	----	0.42	----	0.52	0.51
					WBIL	----	0.44	----	0.52	0.51
Mb 41061C, C3	M 11 from N of Fennessey St N to N of Johnson Park entrance	Rieth-Riley Construction Co., Inc.	Pit 41-50	Pit 70-27	NBOL	----	0.44	----	0.50	0.45
					NBIL	----	0.44	----	0.58	0.45
					SB	----	0.40	----	0.52	0.46
U 41063A, C5 U 41063D, C6 U 41063E, C7 F 41063B, C8	M 11 from Division St E to I 96	Michigan Colprovia Co.	Pit 41-14	Pit 70-27	EBOL	----	0.43	----	0.46	0.39
					EBIL	----	0.46	----	0.52	0.42
					WBOL	----	0.45	----	0.46	0.38
					WBIL	----	0.47	----	0.52	0.43
F 50011E, C11	M 53 from 15 Mile Rd to 17-1/2 Mile Rd	Cooke Contracting Co.	Pits 50-35 & 63-4	Pits 50-21 & 50-35	NBOL	----	----	0.35	0.45	0.42
					NBCL	----	----	0.30	0.41	0.34
					NBIL	----	----	0.32	0.43	0.37
					SBOL	----	----	0.33	0.47	0.45
					SBCL	----	----	0.31	0.44	0.43
					SBIL	----	----	0.34	0.46	0.47
F 50022D, C3	M 59 from W of M 97 E to E of M 29	Ward and Van Nuck, Inc.	Pit 63-4	Pit 50-21	EBOL	----	0.44	----	0.51	0.54
					EBIL	----	0.42	----	0.54	0.67
					WBOL	----	0.42	----	0.51	0.56
					WBIL	----	0.43	----	0.54	0.61
U 50051A, C20	US 25 from Common Rd N to 14 Mile Rd	Asphalt Products	E. C. Levy	E. C. Levy	NBOL	----	0.48	----	0.51	0.43
					NB#3	----	0.48	----	0.48	0.46
					NB#2	----	0.44	----	0.52	0.48
					NBIL	----	0.46	----	0.54	0.50
					SBOL	----	0.45	----	0.44	0.48
					SB#3	----	0.40	----	0.44	0.45
					SB#2	----	0.43	----	0.49	0.42
					SBIL	----	0.43	----	0.54	0.47
F 52043A, C5	US 41 from 3.5 mi NW of Alger-Marquette Co. Line NW to NW of M 94	Payne and Dolan of Wisconsin, Inc.	Pit 52-39	Pit 52-9	NB	----	0.68	----	0.69	0.75
					SB	----	0.68	----	0.70	0.73

TABLE 11 (Cont.)
BITUMINOUS CONCRETE PAVEMENT (4.12) CONSTRUCTED IN 1964

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction				
			Coarse	Fine		1964	1965	1966	1969	1974
F 55011A, C7 F 55012A, C5 F 55012B, C6	US 41 from 1 mi S of Ingalls N to N limits of Daggett, omitting that portion within the Stevenson limits	George Hocking Construction Co.	Pit 55-4	Pit 55-4	NB SB	---- ----	0.51 0.51	---- ----	0.56 0.53	0.49 0.46
BU 61075E, C5 BU 61075A, C6 BU 61075A, C15 BF 61075A, C16	US 31 from Marcoux St N to River Rd	Spartan Asphalt Paving Co.	Pit 75-5	Pit 70-9	NBOL NBCL NBIL SBOL SBCL SBIL	---- ---- ---- ---- ---- ----	0.37 0.45 0.51 0.42 0.40 0.53	---- ---- ---- ---- ---- ----	0.41 0.47 0.61 0.43 0.42 0.60	0.41 0.47 0.49 0.39 0.42 0.51
BF 61075D, C7	US 31 from N of Colby Rd NW to existing US 31, N of Whitehall	Spartan Asphalt Paving Co.	Pit 75-5	Pit 70-9	NBOL NBIL SBOL SBIL	---- ---- ---- ----	0.47 0.62 0.50 0.63	---- ---- ---- ----	0.51 0.68 0.53 0.68	0.49 0.65 0.51 0.65
F 62031C, C9 F 62031C, C10	M 37 - M 46 from S of 96th St to Wood St in Newaygo	Paul C. Miller	Pit 41-22	Pit 70-9	NBIL SBIL	---- ----	0.46 0.44	---- ----	0.55 0.54	0.48 0.48
F 63041E, C7	M 59 from Airport Rd to Elizabeth Lake Rd	Kline Construction Co.	Pit 63-4	Pit 63-54	EBIL WBIL	---- ----	0.42 0.42	---- ----	0.48 0.49	0.51 0.55
Mb 73031A, C8 SS 73031A, C9	M 47 from Bell Ave in St. Charles N to M 46	Saginaw Asphalt Paving Co.	Pit 79-21	Pits 73-5 & 76-32	NB SB	---- ----	0.49 0.50	---- ----	0.57 0.61	0.52 0.54
F 73051B, C1 F 73051D, C2	M 13 from M 57 N to Washington St in Saginaw	Saginaw Asphalt Paving Co.	Pits 17-40 & 75-5	Local pits	NB SB	---- ----	0.36 0.37	---- ----	0.42 0.43	0.35 0.35
F 73151C, C1	M 15 from S of M 81 SE to the Tuscola-Saginaw Co. Line (Reese Rd)	Bay Asphalt Co.	Pit 79-21	Pits 73-5 & 76-32	NB SB	---- ----	0.47 0.48	---- ----	0.54 0.58	0.54 0.61
U 77033C, C4	US 25 from Glenwood Ave NW to Thomas St	Blue Water Asphalt Co., Inc.	Pit 17-40	Pit 74-51	NBOL NBIL SBOL SBIL	---- ---- ---- ----	0.35 0.32 0.41 0.32	---- ---- ---- ----	0.41 0.42 0.39 0.43	0.48 0.45 0.49 0.51
Fb 79031C, C3	M 15 from Willard Rd N to S limits of Millington	Cooke Contracting Co.	Pit 32-4	Pit 79-53	NB SB	---- ----	0.49 0.50	---- ----	0.60 0.56	0.55 0.58
Fb 79031C, C4	M 15 from S of N limits of Millington N to N of S limits of Vassar	Cooke Contracting Co.	Pit 32-4	Pit 79-53	NB SB	---- ----	0.48 0.48	---- ----	0.58 0.58	0.58 0.60
F 82052G, C25	US 24 from Eureka St N to Haskell St	Detroit Asphalt Paving Co.	Pit 47-3	Pit 82-11	NBOL NBCL NBIL	---- ---- ----	0.34 0.40 0.43	---- ---- ----	0.48 0.49 0.51	0.38 0.42 0.42

TABLE 12
BITUMINOUS AGGREGATE PAVEMENT (4.11) CONSTRUCTED IN 1964

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Average Coefficient of Wet Sliding Friction			
			Coarse	Fine		1964	1965	1969	1974
Mb 20012C, C2	I 175 BL (southbound only) from 0.7 mi S of M 72 N to S limits of Grayling	Central Paving Co.	Pit 20-30	---	SBOL	-----	0.41	0.48	0.30
					SBIL	-----	0.49	0.61	0.44
Mb 42012C, C5	US 41 from 0.5 mi NE of FAS #313 E and NE to SW of M 26	Thornton Construction Co.	Pit 42-6	---	NB	-----	0.56	0.69	0.59
					SB	-----	0.60	0.69	0.59
F 43022C, C9 F 67021C, C3	US 10 from 0.4 mi W of Hawkins Rd E to 1.9 mi E of the Lake-Osceola Co. Line	The Hicks Co.	Pit 67-8	---	EB	-----	0.51	0.67	0.53
					WB	-----	0.51	0.65	0.51
SS 51031C, C4	M 22 from US 31 N'ly to the Manistee-Benzie Co. Line	Saginaw Asphalt Paving Co.	Pit 51-11	---	NB	0.32	-----	0.58	0.55
					SB	0.34	-----	0.59	0.57
F 52011A, C6	M 95 from Michigamme River N	Payne and Dolan of Wisconsin, Inc.	Pit 52-61	---	NB	-----	0.55	0.59	0.56
					SB	-----	0.54	0.57	0.52
SS 52032A, C4	M 35 from N of Palmer NE to County Rd #480	Payne and Dolan of Wisconsin, Inc.	Pit 52-9	---	NB	-----	0.48	0.63	0.66
					SB	-----	0.49	0.66	0.67
SS 57012C, C4	M 55 - M 66 from 1st St N to Union St in Lake City	The Hicks Co.	Pit 57-20	---	NBOL	-----	0.47	0.47	0.48
					NBIL	-----	0.47	0.50	0.42
					SBOL	-----	0.48	0.47	0.48
					SBIL	-----	0.46	0.49	0.47
FFH 64022A, C3	M 82 from US 31 E to Billings Ave	Rieth-Riley Construction Co., Inc.	Pit 64-41	---	EB	-----	0.52	0.60	0.52
					WB	-----	0.50	0.62	0.52
F 66022B, C2	M 28 from 2.5 mi E of Bergland SE to Ewen	Mathy Construction Co.	Pit 66-4	---	EB	-----	0.61	0.55	0.61
					WB	-----	0.60	0.59	0.62
SS 71011A, C1 SS 71011B, C2	M 33 from the Montmorency-Presque Isle Co. Line N to M 68 in Onaway	Spartan Asphalt Paving Co.	Pit 60-21	---	NB	-----	0.51	0.62	0.58
					SB	-----	0.50	0.58	0.60

SECTION IV

EXPERIMENTAL FEATURES IN PAVEMENT SURFACES

Table 13 - Rubberized Sand-Asphalt; US 31, City of Charlevoix

A general six-year trend of declining friction values on this 1960 rubberized sand-asphalt surface reached a level below 0.40 with the 1974 tests.

Table 14 - 3BC Sand-Asphalt Resurfacing, US 131, North and South of Alba (Project Mm 4BC-3A, Control Section 05072)

Both test areas under study declined in skid resistance again this year, but continued to exhibit a respectable friction level after 10 years of service. No significant difference in coefficients is apparent between the 150/175 penetration sand-asphalt using 6.4 percent bitumen and the 85/100 penetration sand-asphalt using 6.9 percent bitumen.

Table 15 - Bituminous Concrete Interstate Projects

Table 15 presents the results of skid tests taken on a representative sample of Interstate bituminous concrete projects which were constructed in 1961 and 1962. The 1974 tests yielded friction levels ranging from 0.35 to 0.65 and averaging 0.53. Particular attention has been given to differences in performance between inside (passing) and outside (traffic) lanes during the past 13 years of this study. Outside lane Wsf values, as tested during 1974, ranged from 0.35 to 0.60 and averaged 0.48, while the inside lanes ranged from 0.54 to 0.65 and averaged 0.59. Outside lane Wsf values are 23 percent higher than inside lane values.

Table 16 - Bridge Deck Surface Coatings

Table 16 summarizes the skid test history for five types of bridge deck surface coatings on 36 structures.

1. Rubberized Bituminous Concrete

Thirty-six lanes have been tested annually since their construction in 1967 or 1968. The 1974 tests resulted in friction levels ranging from 0.36 to 0.61 and averaging 0.43. Performing best was B01 of 79051 with an average Wsf value on the northbound of 0.59 and on the southbound of 0.61.

2. Asbestos Mixtures

The northbound lanes of X01 of 81075 (US 23 BR over the Huron River, north of Ann Arbor) were coated in 1967 with a mix comprised of asbestos

and sand-asphalt, while the southbound has a rubberized bituminous concrete mixture applied. After a seven-year service period, the northbound lanes averaged 0.47 and the southbound lanes averaged 0.55.

3. Epoxy Coatings

After five service years, skid tests revealed average friction levels of 0.36 and 0.38 on the north and south halves of the Creyts Rd Bridge over I 496. An E-15 Versamid 140 coating was used on the north half; the south half of the deck was coated with Guard-Kote 250.

An epoxy mortar was applied to the decks of S04 of 33083 and B02 of 73131. After three and five service years, respectively, average Wsf values were 0.52 and 0.53.

4. Latex Modified Mortar

Latex modified mortar is a portland cement mortar. Part of the mix water has been replaced with a latex emulsion to increase the bond and tensile strength of the resulting surface mix.

Coefficients ranged from 0.27 to 0.56 and averaged 0.39 on latex modified mortar structures. Forty-nine percent of the lanes tested had Wsf values lower than 0.40. The 1974 tests on all lanes of structures S26 of 82195, S27 of 82195, S04 of 41026 and S05 of 41026 yielded coefficients lower than those determined during the 1973 test year. These four structures represent 36 percent of the lanes tested.

5. Latex Concrete

Latex concrete is a portland cement mix. The inclusion of a 25A aggregate in a latex concrete mix design is the basic difference between it and a latex modified mortar mix.

Forty lanes of latex concrete surfacing were skid tested during the 1974 test year. Coefficients ranged from 0.28 to 0.53 and averaged 0.39. Fifty-eight percent of the lanes tested yielded Wsf values averaging lower than 0.40. Considering only the lanes surfaced in 1972, 16 of the 34 lanes (47 percent) exhibit a loss in friction level since the 1973 tests -- not conclusive enough to determine a trend.

Table 17 - Experimental Skid Resistant Resurfacing

Skid tests were continued this year at 11 experimental skid resistant resurfacing locations which were constructed in 1965. After nine years of

service Wsf values range from 0.35 to 0.62 and average 0.47. Only 8 percent of the lanes tested (five lanes) produced coefficients under 0.40; all five lanes were confined to the US 24 at Five Mile Rd location in Detroit. Fifteen of the lanes had Wsf values of 0.50 or higher; the remaining 69 percent had values between 0.40 and 0.49.

An August 1968 surfacing of northbound US 24 between Joy Rd and West Chicago was tested this year after a six-year service period. Uniform results were obtained as Wsf values ranged from 0.46 to 0.48 and averaged 0.47.

Table 18 - Textured Concrete Pavement Surfaces on Northbound I 69 (Project I 13074-001)

Four-year skid tests on the northbound I 69 textured pavement continue to show effects of traffic wear. During the initial service year of this pavement, inside and outside lanes differed by 1 to 6 percent in friction level; the inside lane was consistently higher. After a four-year service period, the inside lanes continue to possess a higher skid resistance level but the inside-outside lane comparisons differ by 28 to 35 percent.

Table 19 - Gussasphalt and Mastiphalt Surfaces on US 31, Research Project 72 C-14

In 1972, a 500-ft Gussasphalt surface was placed on US 31, north of the B3 of 53031 structure over the Pere Marquette River. Gussasphalt was also used to resurface the deck of B2 of 64013 (US 31 over north branch of the Pentwater River). Immediately north of the 500-ft Gussasphalt surface, a 500-ft section of Mastiphalt was placed on the US 31 roadway.

After two service years, coefficients on both Gussasphalt locations ranged from 0.39 to 0.44 and average 0.41. The Mastiphalt surface yields friction levels ranging from 0.42 to 0.48 and averaging 0.45. Tests on the inside lanes of the Gussasphalt produced considerably lower two-year Wsf values than initial year tests. The Mastiphalt surface increased in friction level after a one-year service period but dropped at the two-year level.

Table 20 - Spray Grip Surface, Research Project 72 NM-326

A Spray Grip surface was initially placed at the intersection of US 24 and 10 Mile Rd in the fall of 1972. Excellent initial friction levels, averaging 0.78, were determined. However, in 1973, due to the bonding problem, the initial surface was replaced. The "new" Spray Grip surface was first tested in 1973. Excellent results were again found; Wsf values ranged

from 0.73 to 0.87 and averaged 0.81. In 1974, after a one-year service period, coefficients categorized the same, ranging from 0.67 to 0.73 and averaging 0.70.

Table 21 - Epoxy and Natural Emery Seal Coat

Low friction levels were indicated on B01 of 49023 (US 2 over the Cut River) through the Department's High Accident location testing program in 1973. Friction levels, at that time, on the concrete deck ranged from 0.15 to 0.22 and averaged 0.18. An epoxy and natural emery seal coat surface was placed on subject structure in July of 1974. Initial year skid tests on this surface ranged from 0.75 to 0.82 and averaged 0.78.

Tables 22 and 23 - Lakelite Aggregate Sections

Lakelite is a lightweight, porous material and was incorporated into the mix design of two experimental surfaces, constructed in 1972.

Project Mbr 62032-04779A, located on M 37 in Newaygo County, has variations in percent bitumen, percent Lakelite and size of material. Outstanding friction levels were obtained on all areas, including those in which Lakelite was not incorporated into the mix design. Two-year Wsf values ranged from 0.58 to 0.81 and averaged 0.68 in the Lakelite areas; non-Lakelite area test results ranged from 0.57 to 0.70 and averaged 0.63.

Project Mm 2 SC-7A (M 43 in Hastings) also had Lakelite incorporated into its mix design. Friction levels ranged from 0.58 to 0.63 and averaged 0.60 after two years of service.

Table 24 - Trinidad Asphalt Surfacing, Project Mb 72013-06140A, Research Project 73 C-16

A resurfacing project on US 27 from Snow Bowl Rd north to M 55 used a Trinidad asphalt mix design and was completed August 2, 1974. Within the limits of this project, a conventional bituminous concrete surface was also placed as a control device. Initial year friction levels on the Trinidad asphalt surface ranged from 0.42 to 0.63 and averaged 0.53. The adjacent bituminous concrete control section yielded Wsf values ranging from 0.51 to 0.62 and averaging 0.56.

Bituminous Surface Using White Pine Slag, Research Project 72 NM-316

Skid tests were conducted October 2, 1973 on Halfway Rd running south and east from a point approximately seven miles west of Ontonagon. A mix

design employing White Pine slag was used in the surfacing of this roadway. Initial Wsf values ranged from 0.47 to 0.58 and averaged 0.53. Follow-up tests were made on September 25, 1974, after a one-year service period. Wsf values resulting from these tests ranged from 0.61 to 0.71 and averaged 0.65. Outstanding 1974 friction levels are approximately 23 percent higher than those determined initially in 1973.

Visual inspection of this surface was made on October 2, 1974. At this time some evidence of rounding off of sharp aggregate edges was present. Subject roadway is not exposed to a high traffic volume, therefore several years of follow-up testing of this surface are planned. Skid tests have been scheduled for the fall of 1975.

Table 25 - Napoleon Sandstone Surface

A 5,000 ft experimental Napoleon Sandstone blend was placed at the south end of Project Mb 46061-04845A, located on US 223 from 1,700 ft northwest of Onsted Rd northwesterly to US 127. Four series of skid tests have been performed since construction in 1973. The highest Wsf values were obtained in April 1974. The most recent skid tests were conducted in September 1974 and Wsf values averaged 0.39 or higher in all test areas, although friction levels were 8 to 30 percent lower than the April tests. A complete summary of results are contained in Table 25.

TABLE 13
RUBBERIZED SAND-ASPHALT, US 31, CITY OF CHARLEVOIX

Test Year	Average Coefficient of Wet Sliding Friction	
	Firestone Tire	General Tire
1958*	0.19	----
1959**	0.48	----
1960	0.52	----
1961	0.40	----
1962	0.38	----
1964	----	0.46
1965	----	0.44
1966	----	0.40
1967	----	0.40
1968	----	0.57
1969	----	0.52
1970	----	0.51
1971	----	0.55
1972	----	0.49
1973	----	0.41
1974	----	0.37

* Initial tests on polished portland cement surface.

** Tests conducted on temporary seal coat applied in summer 1959, with surfacing in October 1960.

TABLE 14
3BC SAND-ASPHALT RESURFACING, US 131, NORTH AND SOUTH OF ALBA
(Project Mm 4BC-3A, Control Section 05072)

Test Area Locations	Asphalt Cement	Aggregate	Mineral Filler	Direction and Lane	Average Coefficient of Wet Sliding Friction											
					July 1964	Oct. 1964	June 1965	Sept. 1966	Aug 1967	June 1968	July 1969	Oct. 1970	Aug 1971	July 1972	June 1973	June 1974
Mancelona to S of Alba	85/100 penetration (6.9-percent bitumen)	1:1 mixture from Polous and Gerstenberger Pits	fly ash (Detroit Edison)	SBOL/SB*	0.51	0.54	0.56	0.50	0.54	0.56	0.56	0.57	0.58	0.60	0.57	0.48
				SBIL/NB*	0.68	0.66	0.68	0.62	0.65	0.63	0.59	0.60	0.59	0.59	0.55	0.48
N of Alba to M 32	150/175 penetration (6.4-percent bitumen)			SBOL/SB*	0.50	0.60	0.56	0.52	0.55	0.56	0.59	0.58	0.57	0.59	0.60	0.51
				SBIL/NB*	0.63	0.68	0.68	0.64	0.67	0.62	0.60	0.60	0.60	0.60	0.61	0.51

* Effective 11-12-68, US 131 has been returned to a two-lane roadway, with the elimination of the former NB lanes between M 66 and M 32. Consequently future traffic flow over the test area will carry north and southbound traffic.

TABLE 15
BITUMINOUS CONCRETE INTERSTATE PROJECTS

Project No.	Length, mi.	Location	Date Paved (Wearing Course)	Paving Contractor	Source of Coarse Aggregate	Lane(1)	Average Coefficient of Wet Sliding Friction													
							Firestone Tire				General Tire									
							1961	1962	Apr. 1963	Aug. 1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
18034, C3	6.758	M 61 to Arnold Rd	May-June 1962	Rieth-Riley	Wallace Stone Co. (Pit 32-4)	IL	0.52(2)	----	----	----	0.58	0.64	0.56	0.59	0.60	0.65	0.57	0.59	0.63	0.62	0.60
						OL	0.51(2)	----	----	----	0.47	0.48	0.41	0.42	0.46	0.53	0.44	0.51	0.52	0.46	0.44
72014, C4 20016, C1	6.273	0.6 mi. S of Roscommon-Crawford Co. Line to M 18 - M 76	May-June 1962	Thornton Construction	Pickett, Schreur (Merrit Pit)	IL	----	0.51	----	0.58	0.68	0.63	0.56	0.64	0.64	0.72	0.72	0.72	0.73	0.73	0.62
						OL	----	0.48	----	0.53	0.59	0.53	0.49	0.54	0.59	0.66	0.63	0.65	0.68	0.65	0.54
20015, C3	4.847	Co. Rd 612 to N Crawford Co. Line	Sept. 1961	Thornton Construction	McCready Pit (Pit 60-18)	IL	0.60	0.60	0.61	0.59	0.73	0.66	0.59	0.66	0.65	0.73	0.70	0.72	0.75	0.76	0.65
						OL	0.56	0.52	0.56	0.51	0.63	0.59	0.52	0.54	0.60	0.70	0.66	0.66	0.69	0.66	0.60
69013, C1	7.665	Otsego Co. Line N	Oct. 1961	Saginaw Asphalt	Afton Quarry (Pit 20-35)	IL	----	----	0.57	0.59	0.70	0.60	0.49	0.58	0.52	0.58	0.55	0.54	0.59	0.57	0.55
						OL	----	----	0.49	0.54	0.54	0.44	0.36	0.40	0.41	0.48	0.41	0.46	0.48	0.45	0.39
		Marlette Rd to Charles Brink Rd	June 1962	Saginaw Asphalt	Afton Quarry (Pit 20-35)	IL	----	----	0.56	0.59	0.68	0.64	0.48	0.58	0.58	0.62	0.58	0.55	0.60	0.56	0.54
						OL	----	----	0.47	0.47	0.48	0.44	0.35	0.37	0.42	0.48	0.46	0.44	0.47	0.42	0.35
69013, C3, C5	5.385	Charles Brink Rd N to M 32 (Gaylord)	June 1962	Spartan Asphalt	Lewiston Pit	IL	----	----	0.59	0.63	0.71	0.66	0.60	0.70	0.66	0.73	0.72	0.72	0.74	0.72	0.61
						OL	----	----	0.54	0.57	0.62	0.57	0.50	0.56	0.58	0.67	0.66	0.66	0.67	0.63	0.56
16091, C9	2.629	0.5 mi. S of M 68 N to MC RR	Aug-Sept 1962	East Shore Asphalt	Big Cut Pit (Pit 71-15)	IL	----	0.62	----	0.63	0.75	0.75	0.70	0.70(3)	0.74	0.74	0.74	0.79	0.73	0.72	0.54
						OL	----	0.58	----	0.56	0.58	0.60	0.52	0.52(3)	0.58	0.62	0.63	0.66	0.64	0.59	0.46

(1) IL and OL denote passing and traffic lanes.
(2) Tested on leveling course mix.
(3) Average of 2 series of tests in 1967.

TABLE 16
BRIDGE DECK SURFACE COATINGS

Bridge No.	Location	Year Coated	Type of Coating	Direction and Lane	Average Coefficient of Wet Sliding Friction							
					1967	1968	1969	1970	1971	1972	1973	1974
B02 of 11052	US 31 - US 33 over St. Joseph River in Berrien Springs	1967	Rubberized bituminous concrete	NB	----	0.39	0.47	0.40	0.40	0.45	0.28	0.40
				SB	0.43	0.36	0.43	0.37	0.36	0.44	0.28	0.38
X01 of 19032	US 27 over GTWRR in St. Johns	1967	Rubberized bituminous concrete	NBOL	0.53	0.44	0.50	0.47	0.49	0.51	0.47	0.44
				NBIL	0.56	0.50	0.55	0.52	0.55	0.57	0.49	0.48
				SBOL	0.53	0.48	0.51	0.49	0.50	0.54	0.50	0.43
				SBIL	0.60	0.56	0.57	0.56	0.61	0.61	0.51	0.50
B01 of 79051	M 24 over Cass River in Caro	1967	Rubberized bituminous concrete	NB	0.53	0.48	0.56	0.51	0.54	0.57	0.56	0.59
				SB	0.50	0.48	0.55	0.53	0.55	0.59	0.62	0.61
B01 of 61076	M 20 over Muskegon River	1968	Rubberized bituminous concrete	NBOL	----	0.46	0.49	0.49	0.51	0.52	0.47	0.39
				NBIL	----	0.48	0.53	0.50	0.55	0.56	0.53	0.46
				SBOL	----	0.44	0.49	0.46	0.48	0.49	0.45	0.42
				SBIL	----	0.44	0.52	0.49	0.49	0.52	0.49	0.39
B02 of 61076	M 20 SB over Cedar Creek	1968	Rubberized bituminous concrete	SBOL	----	0.44	0.50	0.48	0.46	0.53	0.50	0.44
				SBIL	----	0.44	0.55	0.50	0.53	0.58	0.52	0.48
B03 of 61076	M 20 NB over Cedar Creek	1968	Rubberized bituminous concrete	NBOL	----	0.46	0.52	0.49	0.51	0.54	0.48	0.47
				NBIL	----	0.45	0.54	0.53	0.52	0.58	0.52	0.48
S04 of 61072	M 46 over US 31	1968	Rubberized bituminous concrete	EBOL	----	0.45	0.45	0.43	0.49	0.54	0.48	0.38
				EBCL	----	0.43	0.49	0.49	0.52	0.53	0.50	0.40
				EBIL	----	0.45	0.54	0.50	0.54	0.55	0.53	0.44
				WBOL	----	0.42	0.48	0.43	0.49	0.50	0.43	0.41
				WBCL	----	0.43	0.49	0.47	0.54	0.54	0.47	0.40
				WBIL	----	0.50	0.55	0.50	0.57	0.55	0.54	0.44
S16 of 82111	Grand River Ave (I 96 BS) over I 696 BS	1968	Rubberized bituminous concrete	EBOL	----	0.52	0.47	0.46	0.44	0.54	0.48	0.42
				EBCL	----	0.44	0.43	0.40	0.43	0.44	0.28	0.37
				EBIL	----	0.43	0.41	0.41	0.43	0.48	0.33	0.37
				WBOL	----	0.49	0.49	0.47	0.46	0.48	0.33	0.42
				WBCL	----	0.42	0.39	0.40	0.42	0.39	0.28	0.37
				WBIL	----	0.43	0.41	0.41	0.44	0.50	0.35	0.47

TABLE 16 (Cont.)
BRIDGE DECK SURFACE COATINGS

Bridge No.	Location	Year Coated	Type of Coating	Direction and Lane	Average Coefficient of Wet Sliding Friction							
					1967	1968	1969	1970	1971	1972	1973	1974
S17 of 82023	Grand River Ave (I 96 BS) over I 94	1968	Rubberized bituminous concrete	EBOL	-----	0.44	0.38	0.35	0.41	0.43	0.41	0.37
				EBCL	-----	0.44	0.37	0.34	0.39	0.42	0.40	0.36
				EBIL	-----	0.45	0.40	0.36	0.38	0.45	0.43	0.39
				WBOL	-----	0.50	0.43	0.40	0.44	0.48	0.40	0.42
				WBCL	-----	0.44	0.37	0.36	0.40	0.41	0.40	0.39
				WBIL	-----	0.44	0.39	0.35	0.39	0.43	0.43	0.37
S05 of 58152	Newport Rd over I 75, Newport	1967	Rubberized asbestos and bituminous concrete	EB	0.46	0.50	0.51	0.49	0.46	0.51	(1)	0.38
				WB	0.47	0.50	0.51	0.52	0.49	0.57	(1)	0.43
X01 of 81075	US 23 BR over Huron River, North of Ann Arbor	1967	Asbestos mix plus sand asphalt	NBRL	0.57	0.52	0.55	0.54	0.58	0.60	0.49	0.41
				NBOL	0.58	0.53	0.57	0.56	0.66	0.62	0.51	0.45
				NBIL	0.60	0.56	0.66	0.62	0.68	0.68	0.56	0.56
		1967	Rubberized bituminous concrete plus sand asphalt	SBRL	0.61	0.50	0.57	0.54	0.64	0.59	0.48	0.42
				SBOL	0.59	0.55	0.64	0.59	0.69	0.64	0.52	0.58
				SBIL	0.58	0.58	0.64	0.62	0.73	0.72	0.56	0.64
S05 of 23081	Creyts Rd over I 496	1969	North half of deck only E 15 Versamid 140	NB	----	----	0.67	0.54	0.37	0.35	0.39(2)	0.34
				SB	----	----	0.66	0.54	0.44	0.39	0.44(2)	0.38
			South half of deck only Guard Kote 250	NB	----	----	0.75	0.52	0.46	0.50	0.45(2)	0.41
				SB	----	----	0.69	0.49	0.36	0.49	0.49(2)	0.36
S04 of 33083	I 96 over Cedar St - Penn Ave. Access Rd	1971	Epoxy Mortar	EBRL	----	----	----	----	0.68	0.48	0.36	0.63
				EBOL	----	----	----	----	0.63	0.39	0.47	0.49
				EBIL	----	----	----	----	0.68	0.46	0.47	0.52
				WBOL	----	----	----	----	0.63	0.31	0.38	0.52
				WBIL	----	----	----	----	0.57	0.47	0.29	0.42
B02 of 73131	M 83 over Cass River, Frankenmuth	Aug 1969	Epoxy Mortar	NBOL	----	----	----	0.57	0.57	0.60	0.58	0.53
				NBIL	----	----	----	0.52	0.58	0.58	0.54	0.51
				SBOL	----	----	----	0.60	0.63	0.66	0.57	0.54
				SBIL	----	----	----	0.56	0.60	0.60	0.56	0.55

(1) Not tested (approaches torn up)
(2) Average of two test series

TABLE 16 (Cont.)
BRIDGE DECK SURFACE COATINGS

Bridge No.	Location	Year Coated	Type of Coating	Direction and Lane	Average Coefficient of Wet Sliding Friction							
					1967	1968	1969	1970	1971	1972	1973	1974
S26 of 82195	John R over I 75	1969	Latex Modified Mortar	SBOL	----	----	----	----	----	0.60	0.53	0.42
				SB#3	----	----	----	----	----	0.53	0.47	0.38
				SB#2	----	----	----	----	----	0.47	0.47	0.35
				SBIL	----	----	----	----	----	0.48	0.39	----
S27 of 82195	Brush St over I 75	1969	Latex Modified Mortar	NBOL	----	----	----	----	----	0.54	0.48	0.39
				NBCL	----	----	----	----	----	0.48	0.43	0.34
				NBIL	----	----	----	----	----	0.51	0.44	0.34
S03 of 82022	WB I 94 over Wayne Rd	1970	Latex Modified Mortar	WBOL	----	----	----	----	----	0.44	0.41	0.47
				WBCL	----	----	----	----	----	0.44	0.30	0.39
				WBIL	----	----	----	----	----	0.42	0.30	0.38
X01 of 82022	EB I 94 over Shook Rd and RR	1970	Latex Modified Mortar	EBOL	----	----	----	----	----	0.41	0.32	0.39
				EBCL	----	----	----	----	----	0.44	0.35	0.48
				EBIL	----	----	----	----	----	0.46	0.38	0.56
X02 of 82022	WB I 94 over Shook Rd and RR	1970	Latex Modified Mortar	WBOL	----	----	----	----	----	0.43	(a)	(a)
				WBCL	----	----	----	----	----	0.42	0.29	0.36
				WBIL	----	----	----	----	----	0.54	0.31	0.40
S04 of 41026	M 37 over EB I 96	1971	Latex Modified Mortar	NBOL	----	----	----	----	----	0.42	0.40	0.30
				NBIL	----	----	----	----	----	0.46	0.41	0.29
				SBOL	----	----	----	----	----	0.37	0.35	0.27
				SBIL	----	----	----	----	----	0.41	0.38	0.32
				SBRL	----	----	----	----	----	0.40	0.34	0.30
S05 of 41026	M 37 over WB I 96	1971	Latex Modified Mortar	NBOL	----	----	----	----	----	0.42	0.40	0.30
				NBIL	----	----	----	----	----	0.44	0.39	0.30
				SBOL	----	----	----	----	----	0.33	0.34	0.27
				SBIL	----	----	----	----	----	0.47	0.40	0.30
				SBRL	----	----	----	----	----	0.46	0.39	0.28
S02 of 63022	I 96 over Milford Rd	1971	Latex Modified Mortar	EBOL	----	----	----	----	----	0.32	0.24	0.33
				EBCL	----	----	----	----	----	0.42	0.30	0.42
				EBIL	----	----	----	----	----	0.43	0.31	0.46
				WBOL	----	----	----	----	----	0.38	0.23	0.37
				WBCL	----	----	----	----	----	0.43	0.31	0.42
				WBIL	----	----	----	----	----	0.49	0.34	0.48

(a) Barricaded and unable to test

TABLE 16 (Cont.)
BRIDGE DECK SURFACE COATINGS

Bridge No.	Location	Year Coated	Type of Coating	Direction and Lane	Average Coefficient of Wet Sliding Friction							
					1967	1968	1969	1970	1971	1972	1973	1974
S06 of 82022	WB I 94 over Middlebelt Rd	1971	Latex Modified Mortar	WBOL	----	----	----	----	----	0.38	0.31	0.38
				WBCL	----	----	----	----	----	0.40	0.34	0.40
				WBIL	----	----	----	----	----	0.42	0.35	0.43
S01 of 63022	I 96 over Kent Lake Rd	1972	Latex Modified Mortar	EBOL	----	----	----	----	----	0.50	0.33	0.41
				EBCL	----	----	----	----	----	0.45	0.34	0.42
				EBIL	----	----	----	----	----	0.53	0.41	0.51
				WBOL	----	----	----	----	----	0.46	0.35	0.43
				WBCL	----	----	----	----	----	0.48	0.34	0.42
				WBIL	----	----	----	----	----	0.52	0.39	0.50
S09 of 82022	EB I 94 over Ecorse Rd	1972	Latex Modified Mortar	EBOL	----	----	----	----	----	0.44	0.35	0.46
				EBCL	----	----	----	----	----	0.42	0.39	0.48
				EBIL	----	----	----	----	----	0.45	0.38	0.45
S12 of 82022	WB I 94 over Beech-Daly Rd	1972	Latex Modified Mortar	WBOL	----	----	----	----	----	0.46	0.33	0.40
				WBCL	----	----	----	----	----	0.47	0.37	0.41
				WBIL	----	----	----	----	----	0.43	0.37	0.43
S06 of 25031	Grand Blanc Rd over US 23	1972	Latex Concrete	EB	----	----	----	----	----	----	0.27	0.31
				WB	----	----	----	----	----	----	0.33	0.32
S02 of 25131	Baldwin Rd over I 75 (1.2 mi NW of Oakland County Line)	1972	Latex Concrete	EB	----	----	----	----	----	----	0.47	0.44
				WB	----	----	----	----	----	----	0.51	0.44
S09 of 25131	Fenton Rd over I 75 (2.4 mi SE of US 23)	1972	Latex Concrete	NBOL	----	----	----	----	----	----	0.35	0.35
				NBIL	----	----	----	----	----	----	0.39	0.38
				SBOL	----	----	----	----	----	----	0.35	0.33
				SBIL	----	----	----	----	----	----	0.38	0.36
S01 of 63082	US 24 over SB US 10	1972	Latex Concrete	SBOL	----	----	----	----	----	----	0.33	0.36
				SBIL	----	----	----	----	----	----	0.34	0.38
B02 of 73062	M 46 over Tittabawassee River	1972	Latex Concrete	EBOL	----	----	----	----	----	----	0.27	0.34
				EBIL	----	----	----	----	----	----	0.30	0.32
				WBOL	----	----	----	----	----	----	0.27	0.41
				WBIL	----	----	----	----	----	----	0.32	0.37

TABLE 16 (Cont.)
BRIDGE DECK SURFACE COATINGS

Bridge No.	Location	Year Coated	Type of Coating	Direction and Lane	Average Coefficient of Wet Sliding Friction							
					1967	1968	1969	1970	1971	1972	1973	1974
S02 of 82022	EB I 94 over Wayne Rd	1972	Latex Concrete	EBOL	----	----	----	----	----	----	0.30	0.38
				EBCL	----	----	----	----	----	----	0.33	0.39
				EBIL	----	----	----	----	----	----	0.38	0.51
X01 of 82024	I 94 over DeQuindre Yard	1972	Latex Concrete	EBOL	----	----	----	----	----	----	0.39	0.31
				EBCL	----	----	----	----	----	----	0.38	0.29
				EBIL	----	----	----	----	----	----	0.44	0.28
				WBOL	----	----	----	----	----	----	0.41	0.31
				WBCL	----	----	----	----	----	----	0.40	0.31
				WBIL	----	----	----	----	----	----	0.43	0.32
S01 of 82091	Old M 39 over Gate 10 entrance to Ford Plant	1972	Latex Concrete	NBQL	----	----	----	----	----	----	0.40	0.40
				NB#3	----	----	----	----	----	----	0.42	0.39
				NB#2	----	----	----	----	----	----	0.47	0.46
				NBIL	----	----	----	----	----	----	0.53	0.53
				SBOL	----	----	----	----	----	----	0.43	0.45
				SB#3	----	----	----	----	----	----	0.41	0.40
				SB#2	----	----	----	----	----	----	0.48	0.46
				SBIL	----	----	----	----	----	----	0.52	0.52
S01 of 82191	I 75 over Huron River Dr	1970	Latex Concrete	NBOL[1]	----	----	----	----	----	----	----	0.48
				NBCL	----	----	----	----	----	----	----	0.41
				NBIL	----	----	----	----	----	----	----	0.47
				SBOL[1]	----	----	----	----	----	----	----	0.41
				SBCL	----	----	----	----	----	----	----	0.34
				SBIL	----	----	----	----	----	----	----	0.41
B03 of 82191	I 75 over Goddard Rd	1972	Latex Concrete	NBOL	----	----	----	----	----	----	0.40	0.36
				NBCL	----	----	----	----	----	----	0.37	0.37
				NBIL	----	----	----	----	----	----	0.40	0.44
			Concrete	SBOL	----	----	----	----	----	----	0.31	0.37
				SBCL	----	----	----	----	----	----	0.35	0.41
				SBIL	----	----	----	----	----	----	0.34	0.44

[1] Conventional Concrete

TABLE 17
EXPERIMENTAL SKID-RESISTANT RESURFACING

Control Section	Location	Construction Months	Mixture Type	Route	Direction and Lane	Average Coefficient of Wet Sliding Friction										
						1965	1966		1967	1968	1969	1970	1971	1972	1973	1974
							Spring	Fall								
09033	M 13 at Linwood Rd, N of Bay City	Oct. 1965	80-lb Sandstone + asphalt	M 13	NBOL	0.71	0.49	0.43	0.50	0.51	0.51	0.50	0.50	0.53	0.49	0.49
				M 13	NBIL	0.72	0.52	0.46	0.57	0.59	0.60	0.58	0.59	0.64	0.60	0.56
				M 13	SBOL	0.73	0.49	0.45	0.54	0.54	0.53	0.55	0.51	0.55	0.50	0.49
				M 13	SBIL	0.74	0.58	0.49	0.62	0.63	0.63	0.58	0.59	0.56	0.60	0.57
09033	M 13 at Grove St, N of Bay City	Sept.-Oct 1965	80-lb Sandstone + asphalt	M 13	NBOL	0.73	0.53	0.49	0.59	0.55	0.56	0.55	0.53	0.55	0.53	0.51
				M 13	NBIL	0.76	0.61	0.56	0.66	0.62	0.66	0.67	0.66	0.66	0.64	0.62
				M 13	SBOL	0.75	0.51	0.44	0.40	*	0.43[1]	0.52[1]	0.45[1]	0.48[1]	0.46[1]	0.53[2]
				M 13	SBIL	0.76	0.55	0.51	0.42	*	0.44[1]	0.55[1]	0.50[1]	0.55[1]	0.48[1]	0.51[2]
09042	M 25 at Wagner Rd, E of Bay City	Sept. 1965	80-lb Sandstone + asphalt	M 25	EB	0.77	0.53	0.47	0.51	0.54	0.64	0.62	0.55	0.55	0.48	0.52
				M 25	WB	0.74	0.54	0.47	0.53	0.55	0.66	0.60	0.57	0.58	0.51	0.55
25073	M 54 at M 57, N of Flint	Sept. 1965	50-lb Quartzite + asphalt + additive	M 54BR	NBOL	0.70	0.48	0.43	0.53	0.56	0.61	0.53	0.55	0.64	0.50[4]	0.44[4]
				M 54BR	NBIL	0.71	0.53	0.47	0.55	0.58	0.61	0.59	0.64	0.66	0.67	0.53
				M 54BR	SBOL	0.65	0.50	0.44	0.52	0.55	[3]	0.54	0.60	0.63	0.56[4]	0.45[4]
				M 54BR	SBIL	0.71	0.52	0.49	0.58	0.61	[3]	0.61	0.66	0.69	0.66	0.54
25072	M 54 at M 54BR (S Jct.) S of Flint	Oct. 1965	50-lb crushed beach pebbles + asphalt	M 54	NBOL	0.60	0.49	0.43	0.42	0.43	0.48	0.42	0.48	0.48	0.46	0.43
				M 54	NBIL	0.66	0.47	0.41	0.44	0.45	0.52	0.49	0.52	0.53	0.52	0.49
				M 54BR	SBOL	0.62	0.47	0.46	0.40	0.44	0.48	0.38	0.45	0.44	0.45	0.43
				M 54BR	SBIL	0.66	0.47	0.41	0.41	0.48	0.54	0.48	0.54	0.52	0.53	0.47
				M 54 (Dort)	WBOL	0.62	0.45	0.45	0.46	0.50	0.54	0.52	0.61	0.54	0.49	0.48
				M 54 (Dort)	WBIL	0.62	0.45	0.47	0.48	0.52	0.55	0.50	0.56	0.51	0.46	0.47
81031	US 12, W from Neblo Rd, NW of Clinton	Sept. 1965	50-lb 3BC + hot asphalt emulsion	US 12	EB	0.60	0.49	0.49	0.49	0.52	0.51	0.52	0.48	0.55	0.38	0.48
				US 12	WB	0.62	0.47	0.45	0.49	0.55	0.52	0.50	0.47	0.53	0.38	0.48
81031	US 12, E from Lima Center Rd, NW of Clinton	Sept. 1965	50-lb 2MS + hot asphalt emulsion	US 12	EB	0.58	0.48	0.44	0.55	0.55	0.57	0.52	0.50	0.53	0.36	0.47
				US 12	WB	0.60	0.49	0.47	0.54	0.54	0.57	0.55	0.51	0.54	0.38	0.48
82053	US 24 at Fenkell Rd, (Five Mile Rd), Detroit	Sept. 1965	50-lb 3BC + asbestos fiber + asphalt	US 24	NBOL	0.56	0.36	0.34	0.37	0.38	0.42	0.35	0.36	0.42	0.40	0.35
				US 24	NB#3	0.53	0.36	0.34	0.41	0.40	0.41	0.38	0.37	0.42	0.39	0.37
				US 24	NB#2	0.57	0.36	0.34	0.40	0.41	0.43	0.41	0.37	0.43	0.37	0.40
				US 24	NBIL	0.60	*	*	*	*	*	*	*	*	*	0.39
				US 24	SBOL	0.52	0.38	0.37	0.41	0.39	0.43	0.38	0.40	0.46	0.44	0.39
				US 24	SBCL	0.60	0.37	0.35	0.42	0.42	0.43	0.40	0.42	0.48	0.43	0.43
				US 24	SBIL	0.59	0.35	0.34	0.44	0.40	0.42	0.40	0.43	0.49	0.43	0.45
				Five Mile Rd	EBOL	0.51	0.37	0.31	0.36	0.38	0.37	0.37	0.38	0.43	0.38	0.42
				Five Mile Rd	EBIL	0.55	0.39	0.33	0.41	0.40	0.42	0.41	0.39	0.49	0.37	0.39
				Five Mile Rd	WBOL	0.55	0.37	0.33	0.39	0.40	0.44	0.41	0.39	0.49	0.37	0.41
				Five Mile Rd	WBIL	0.60	0.39	0.33	0.43	0.44	0.44	0.42	0.42	0.49	0.37	0.47

* Not tested
(1) Bituminous concrete, non-experimental
(2) Tested on intersection area only
(3) Work being done at intersection--southbound too dirty to test
(4) Pad worn off in wheel tracks

TABLE 17 (Cont.)
EXPERIMENTAL SKID-RESISTANT RESURFACING

Control Section	Location	Construction Months	Mixture Type	Route	Direction and Lane	Average Coefficient of Wet Sliding Friction										
						1965	1966		1967	1968	1969	1970	1971	1972	1973	1974
							Spring	Fall								
82053	US 24 at Plymouth Rd, Detroit	Sept.-Oct. 1965	50-lb 2MS + asbestos fiber + asphalt	US 24	NBOL	0.59	0.36	0.35	0.42	0.43	0.43	0.43	0.45	0.49	0.44	0.48
				US 24	NB#3	0.59	0.37	0.36	0.41	0.43	0.45	0.42	0.47	0.48	0.47	0.51
				US 24	NB#2	0.62	0.40	0.36	0.44	0.47	0.48	0.51	0.51	0.57	0.47	0.52
				US 24	NBIL	0.62	0.40	0.38	0.45	0.45	0.46	0.55	0.51	0.51	0.46	0.48
				US 24	SBOL	0.60	0.37	0.35	0.42	0.40	0.44	0.40	0.44	0.48	0.46	0.44
				US 24	SB#3	0.62	0.39	0.35	0.43	0.43	0.46	0.42	0.45	0.47	0.43	0.41
				US 24	SB#2	0.61	0.39	0.36	0.45	0.47	0.46	0.45	0.48	0.54	0.45	0.41
				US 24	SBIL	0.64	0.42	0.37	0.50	0.52	0.46	0.59	0.51	0.57	0.55	0.56
				Plymouth Rd	EBOL	0.62	0.40	0.36	0.41	0.41	0.46	0.48	0.45	0.45	0.46	0.46
				Plymouth Rd	EBCL	0.63	0.39	0.36	0.41	0.43	0.44	0.44	0.42	0.49	0.47	0.44
				Plymouth Rd	EBIL	0.64	0.39	0.37	0.41	0.44	0.44	0.51	0.48	0.51	0.47	0.48
				Plymouth Rd	WBOL	0.63	0.40	0.38	0.46	0.47	0.46	0.49	0.49	0.53	0.48	0.46
				Plymouth Rd	WBCL	0.61	0.41	0.37	0.44	0.44	0.46	0.45	0.42	0.50	0.48	0.46
				Plymouth Rd	WBIL	0.60	0.40	0.38	0.46	0.48	0.45	0.53	0.49	0.58	0.46	0.47
82053	US 24 at W. Chicago Rd, Detroit	Oct. 1965	80-lb 2MS + 31AA + asphalt	US 24	NBOL	0.57	0.38	0.37	0.43	0.45	0.44	0.43	0.46	0.49	0.47	0.49
				US 24	NB#3	0.58	0.40	0.37	0.43	0.45	0.46	0.43	0.44	0.49	0.45	0.48
				US 24	NB#2	0.61	0.41	0.36	0.43	0.47	0.46	0.45	0.47	0.52	0.46	0.49
				US 24	NBIL	0.62	0.40	0.37	0.42	0.49	0.46	0.45	0.46	0.52	0.46	0.50
				US 24	SBOL	0.56	0.42	0.41	0.44	0.41	0.45	0.42	0.44	0.50	0.42	0.47
				US 24	SBCL	0.57	0.41	0.40	0.43	0.46	0.45	0.44	0.44	0.48	0.42	0.45
				US 24	SBIL	0.59	0.41	0.40	0.43	0.47	0.46	0.43	0.47	0.50	0.46	0.47
				W. Chicago Rd	EBRT	0.63	0.45	0.44	0.48	0.50	0.45	0.45	0.51	0.56	0.42	0.50
				W. Chicago Rd	EBIL	0.63	0.44	0.40	0.42	0.46	0.45	0.45	0.47	0.54	0.42	0.48
				W. Chicago Rd	WBRT	0.63	0.43	0.41	0.47	0.50	0.46	0.48	0.46	0.52	($)	($)
				W. Chicago Rd	WBIL	0.63	0.41	0.37	0.47	0.47	0.45	0.45	0.48	0.51	($)	($)
82052	US 24 at Sibley Rd, Detroit	Oct. 1965	80-lb 3NS + 31AA + asphalt	US 24	NBOL	0.50	0.41	0.34	0.44	0.45	0.49	0.44	0.44	0.44	0.42	0.43
				US 24	NBIL	0.52	0.42	0.38	0.47	0.47	0.50	0.48	0.49	0.48	0.51	0.45
				US 24	SBOL	0.51	0.43	0.39	0.46	0.47	0.52	0.50	0.47	0.48	0.51	0.42
				US 24	SBIL	0.51	0.42	0.38	0.46	0.46	0.50	0.48	0.50	0.48	0.49	0.42
				Sibley Rd	EB	0.54	0.39	0.36	0.42	0.43	0.45	0.48	0.47	0.44	0.47	0.42
				Sibley Rd	WB	0.52	0.41	0.39	0.45	0.44	0.44	0.43	0.49	0.43	0.48	0.43
82053	US 24 NB (Telegraph Rd) from Joy Rd to West Chicago	Aug. 1968	80-lb crushed fine aggregate	US 24	NBOL	----	----	----	----	0.59	0.44	0.41	0.42	0.48	0.47	0.46
				US 24	NB#3	----	----	----	----	0.60	0.48	0.41	0.42	0.48	0.48	0.46
				US 24	NB#2	----	----	----	----	0.61	0.46	0.42	0.44	0.50	0.48	0.48
				US 24	NBIL	----	----	----	----	0.61	0.45	0.42	0.46	0.49	0.46	0.48

($) Deleted by new construction

TABLE 18
TEXTURED CONCRETE PAVEMENT SURFACES ON NORTHBOUND I 69
(Project I 13074-001)

Texture Method	Test Limits (Sta. to Sta.)	Direction and Lane	Average Coefficient of Wsf				
			1970	1971	1972	1973	1974
Conventional Burlap	2232+00 to 2238+00	NBOL	0.61	0.51	0.47	0.35	0.30
		NBIL	0.65	0.63	0.61	0.52	0.46
Longitudinal Brooming	2242+00 to 2248+00	NBOL	0.69	0.56	0.49	0.33	0.32
		NBIL	0.72	0.68	0.65	0.52	0.47
Transverse Combing	2253+00 to 2259+00	NBOL	0.86	0.70	0.60	0.37	0.39
		NBIL	0.87	0.86	0.78	0.63	0.54
Transverse Brooming	2272+00 to 2278+00	NBOL	0.76	0.56	0.48	0.33	0.33
		NBIL	0.79	0.74	0.72	0.58	0.51

TABLE 19
GUSSASPHALT AND MASTIPHALT SURFACES ON US 31
Research Project 72 C-14

Tested Surface	Test Lane or Direction	40 mph Coefficients of Wsf																	
		10/27/72			11/10/72			1/18/73			5/10/73			12/3/73			6/4/74		
		Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
Gussasphalt	NB	0.76	0.82	0.78	--	--	--	0.57	0.62	0.60	0.60	0.61	0.61	--	--	--	0.40	0.45	0.42
(C.S. 53031)	SB	0.79	0.83	0.81	--	--	--	0.63	0.68	0.66	0.55	0.59	0.58	--	--	--	0.42	0.46	0.44
Mastiphalt	NB	0.37	0.50	0.44	--	--	--	0.48	0.49	0.48	0.56	0.58	0.57	--	--	--	0.40	0.45	0.42
(C.S. 53031)	SB	0.37	0.49	0.42	--	--	--	0.54	0.56	0.55	0.55	0.60	0.57	--	--	--	0.45	0.50	0.48
Gussasphalt	NB	--	--	--	0.73	0.76	0.74	0.64	0.68	0.66	0.60	0.64	0.62	0.49	0.53	0.51	0.37	0.41	0.39
(B2 of 64013)	SB	--	--	--	Not Completed			0.63	0.66	0.64	0.58	0.63	0.60	0.45	0.50	0.48	0.38	0.41	0.40

TABLE 20
SPRAY GRIP SURFACE
US 24 (Telegraph Rd) at 10 Mile Rd, Oakland County
Research Project 72 NM-326

Test Location	Lane	Before Spray Grip			After Spray Grip						New Spray Grip Surface					
		9-19-72 Coefficient of Wsf			11-2-72 Coefficient of Wsf			6-10-73 Coefficient of Wsf			10-29-73 Coefficient of Wsf			8-11-74 Coefficient of Wsf		
		Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
US 24 (Telegraph Road), Immediately North of 10 Mile Rd	SBRT	0.31	0.36	0.34	0.79	0.79	0.79	0.67	0.70	0.69	0.77	0.81	0.79	0.69	0.72	0.70
	SBOL	0.37	0.38	0.37	0.73	0.79	0.77	0.63	0.69	0.66	0.82	0.87	0.85	0.73	0.73	0.73
	SB#3	0.33	0.34	0.33	0.78	0.79	0.79	0.69	0.69	0.69	0.77	0.79	0.78	0.68	0.70	0.69
	SB#2	0.33	0.36	0.34	0.76	0.79	0.78	0.66	0.67	0.66	0.85	0.86	0.85	0.70	0.73	0.72
	SBIL	0.34	0.37	0.36	0.78	0.79	0.79	0.64	0.69	0.66	0.82	0.83	0.83	0.70	0.73	0.72
10 Mile Road, Immediately West of US 24	EB	0.33	0.41	0.38	0.77	0.78	0.78	0.65	0.71	0.68	0.73	0.78	0.75	0.66	0.69	0.67

TABLE 21
EPOXY AND NATURAL EMERY SEAL COAT;
CUT RIVER BRIDGE (B01 of 49023)

Test Location	Surface Type	Lane	Coefficient of Wsf (Test Date: 9-23-74)		
			Low	High	Avg
East of Bridge	Bit	EB	0.43	0.48	0.45
		WB	0.56	0.60	0.58
On Bridge	Epoxy and Natural Emery	EB	0.75	0.81	0.77
		WB	0.78	0.82	0.80
West of Bridge	Bit	EB	0.51	0.56	0.54
		WB	0.58	0.61	0.59

TABLE 22
M 37 LAKELITE AGGREGATE SECTION
Project Mbr 62032-04779A

Section No.	Station to Station	Percent Bitumen	Lakelite Aggregate	Lane	Coefficient of Wsf											
					11-9-72			5-29-73			11-14-73			6-4-74		
					Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
1	240+00 to 244+75	9.0	30% 31A	NB	0.55	0.59	0.57	0.69	0.74	0.72	0.68	0.73	0.70	0.62	0.65	0.63
2	244+75 to 264+15	9.0	32% 31A	NB	0.60	0.61	0.61	0.73	0.76	0.75	0.69	0.72	0.70	0.65	0.68	0.67
3	264+15 to 290+95	8.0	16% 31A	NB	0.50	0.55	0.52	0.69	0.70	0.69	0.60	0.65	0.63	0.58	0.62	0.60
4	290+95 to 292+30	9.5	100% 31A	NB	0.92	0.94	0.93	0.76	0.83	0.79						
5	292+30 to 294+20	10.0	100% 31A	NB	0.88	0.90	0.89	0.82	0.86	0.84	Resurfaced					
6	294+20 to 295+00	8.5	28% 31A	NB	0.80	0.84	0.82	0.72	0.76	0.75						
7	295+00 to 302+50	8.0	25% 31A	NB	0.50	0.61	0.56	0.70	0.74	0.72	0.62	0.68	0.66	0.63	0.68	0.65
8	307+70 to 291+25	9.5	42% 25A	SB	0.66	0.69	0.68	0.78	0.81	0.79	0.69[1] 0.52[2]	0.73 0.62	0.71 0.57	0.71	0.73	0.72
9	291+25 to 264+65	8.0	16% 31A	SB	0.55	0.58	0.57	0.68	0.74	0.71	0.61	0.65	0.63	0.63	0.65	0.64
10	264+65 to 254+00	9.0	30% 31A	SB	0.55	0.58	0.56	0.71	0.72	0.72	0.63	0.67	0.65	0.68	0.71	0.69
11	254+00 to 242+15	9.0	35% 31A	SB	0.65	0.66	0.66	0.76	0.80	0.78	0.70	0.74	0.72	0.74	0.75	0.75
12	242+15 to 239+75	9.0	40% 31A	SB	0.66	0.70	0.68	0.84	0.87	0.86	0.79	0.80	0.79	0.76	0.81	0.78
North Control	302+50 North	---	None	NB	0.50	0.51	0.51	0.58	0.70	0.65	0.56	0.67	0.61	0.58	0.70	0.64
	307+70 North	---	None	SB	0.50	0.52	0.51									
South Control	240+00 South	---	None	NB	0.45	0.48	0.47	0.63	0.66	0.65	0.60	0.66	0.63	0.57	0.67	0.62
	239+75 South	---	None	SB	0.49	0.50	0.50									

[1] North of 14 Mile Rd
[2] South of 14 Mile Rd

TABLE 23
M 43 LAKELITE AGGREGATE SECTION
Project Mm 2SC-7A (Control Section 08012)
Research Project 72 NM-347

Location	Surface	Lane	Coefficient of Wsf											
			9-6-72			5-30-73			11-14-73			5-10-74		
			Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
Coats Grove Rd South (N of Hastings)	28B Agg. Seal	NB	0.59	0.63	0.61	0.64	0.64	0.64	0.49	0.53	0.52	0.53	0.57	0.56
		SB	0.57	0.60	0.59	0.62	0.62	0.62	0.58	0.61	0.60	0.56	0.57	0.57
Coats Grove Rd N 0.5 mile	(Light wt Agg. Seal)	NB	0.87	0.88	0.87	0.80	0.85	0.83	0.58	0.69	0.65	0.58	0.62	0.60
		SB	0.90	0.91	0.91	0.78	0.85	0.82	0.56	0.70	0.67	0.58	0.64	0.61
From 0.5 Mile N of Coats Grove Rd N	28B Agg. Seal	NB	0.57	0.59	0.58	0.64	0.68	0.66	0.50	0.55	0.52	0.55	0.57	0.56
		SB	0.58	0.60	0.59	0.63	0.68	0.66	0.57	0.59	0.58	0.56	0.58	0.57

TABLE 24
TRINIDAD ASPHALT SURFACING
Project MB 72013-06140A
Research Project 73 C-16

Location Sta to Sta	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
450+00 - 514+00	Trinidad Asphalt	NBOL	0.48	0.50	0.49
		NBIL	0.56	0.59	0.58
514+00 - 561+50	Trinidad Asphalt	NBOL	0.48	0.50	0.49
		NBIL	0.54	0.57	0.56
561+50 - 612+00	Trinidad Asphalt	NBOL	0.51	0.53	0.52
		NBIL	0.51	0.54	0.53
612+00 - 706+00	Bit Conc	NBOL	0.51	0.53	0.52
		NBIL	0.58	0.59	0.59
450+00 - 515+00	Bit Conc	SBOL	0.52	0.54	0.53
		SBIL	0.58	0.62	0.60
515+00 - 612+00	Bit Conc	SBOL	0.51	0.55	0.53
		SBIL	0.58	0.62	0.60
612+00 - 659+00	Trinidad Asphalt	SBOL	0.50	0.52	0.51
		SBIL	0.58	0.63	0.60
659+00 - 706+00	Trinidad Asphalt	SBOL	0.42	0.46	0.45
		SBIL	0.53	0.56	0.54

TABLE 25
NAPOLEON SANDSTONE SURFACE
Project Mb 46061-04845A

Mix No.	Blend No.	Station to Station	Direction	Coefficient of Wsf											
				August 23, 1973			October 17, 1973			April 4, 1974			September 16, 1974		
				Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
1	II	490+88 to 496+50	NB	0.34	0.38	0.36	0.28	0.34	0.30	0.55	0.59	0.57	0.39	0.42	0.40
2	II	486+50 to 490+88	NB	0.35	0.42	0.38	0.30	0.31	0.30	0.52	0.56	0.53	0.38	0.40	0.39
2	II	492+26 to 496+50	SB	0.50	0.55	0.53	0.37	0.41	0.38	0.58	0.59	0.59	0.42	0.46	0.44
3	II	484+20 to 492+26	SB	0.41	0.45	0.43	0.28	0.33	0.31	0.55	0.59	0.58	0.40	0.43	0.42
5	I	481+10 to 486+50	NB	0.30	0.32	0.31	0.26	0.31	0.29	0.48	0.48	0.48	0.42	0.43	0.42
6	I	476+50 to 481+10	NB	0.34	0.39	0.37	0.26	0.28	0.27	0.50	0.54	0.52	0.39	0.43	0.41
6	I	474+30 to 484+20	SB	0.40	0.42	0.41	0.22	0.26	0.25	0.54	0.56	0.55	0.38	0.41	0.39
7	III	466+50 to 476+50	NB	0.40	0.42	0.41	0.31	0.35	0.32	0.47	0.49	0.48	0.42	0.45	0.44
7	III	466+50 to 474+30	SB	0.37	0.40	0.39	0.25	0.29	0.27	0.51	0.54	0.53	0.39	0.42	0.41
9	IV	456+50 to 466+50	NB	0.45	0.47	0.46	0.31	0.35	0.33	0.49	0.50	0.50	0.43	0.45	0.44
9	IV	456+40 to 466+50	SB	0.46	0.52	0.49	0.32	0.36	0.34	0.54	0.58	0.57	0.43	0.46	0.44
10	V	446+50 to 456+50	NB	0.45	0.51	0.47	0.32	0.37	0.34	0.53	0.56	0.54	0.42	0.44	0.43
10	V	446+50 to 456+40	SB	0.48	0.51	0.49	0.29	0.34	0.32	0.56	0.59	0.58	0.44	0.46	0.45

SECTION V

HIGH ACCIDENT LOCATIONS

High Accident Locations

This section reports the Department's continuing program to reduce skidding accidents on wet pavement at critical locations. High-accident locations are skid tested to indicate priorities for resurfacing. In some cases, these locations are used for testing experimental skid-resistant resurfacing mixtures.

Selection of high-accident locations for this test year was made by the Traffic and Safety Division and is based on 1973 accident data. Skid tests yielded average Wsf values below 0.40 at 68 percent of the 922 lanes tested in 1973. Average friction levels for 18 percent were below 0.30 while 6 percent averaged below 0.20.

During 1974, skid tests were conducted on 24 major highway routes. Testing was dispersed throughout six districts, 17 counties, and 77 separate locations. Table 26 summarizes the high accident skid tests.

TABLE 26
HIGH ACCIDENT LOCATIONS FOR DISTRICTS 3, 5, 6, 7, 8, AND METRO

	Control Section	Location and Mileage	1973 Accidents Total	1973 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
DISTRICT 3	**Wexford County**								
	83032	US 131 from 0.89 to 1.09 (Gunn and E Ayer, 0.94) City of Cadillac	21	48	NBOL	Bit	0.47	0.48	0.47
					NBIL	Bit	0.51	0.52	0.52
					SBOL	Bit	0.49	0.53	0.51
					SBIL	Bit	0.51	0.53	0.52
	83032	US 131 from 1.39 to 1.59 (Irma Ave, 1.52) Haring Twp	15	53	NBOL	Conc	0.39	0.41	0.40
					NBIL	Bit	0.50	0.54	0.52
					SBOL	Conc	0.44	0.44	0.44
					SBIL	Bit	0.51	0.53	0.51
DISTRICT 5	**Ionia County**								
	34032	M 66 from 7.02 to 7.22 (Main, 7.11) City of Ionia	35	37	NBOL	Conc	0.29	0.33	0.31
					NBIL	Conc	0.33	0.35	0.34
					SBOL	Conc	0.29	0.30	0.30
					SBIL	Conc	0.30	0.31	0.30
	Kent County								
	41012	M 44 Connector (formerly US 131) from 0.31 to 0.51 (Rupert, 0.49) City of Grand Rapids	32	31	NBOL	Bit	0.50	0.51	0.51
					NBIL	Bit	0.46	0.51	0.49
					SBOL	Bit	0.46	0.47	0.46
					SBIL	Bit	0.48	0.50	0.49
	41033	M 37 from 0.21 to 0.36 (WB I 96, 0.21) City of Walker	35	40	NBOL	Conc	0.28	0.33	0.31
					NBIL	Conc	0.24	0.28	0.25
					SBOL	Conc	0.29	0.34	0.32
					SBIL	Conc	0 30	0.33	0.31
					NBOL	Bit	0.39	0.45	0.43
					NBIL	Bit	0.50	0.52	0.51
					SBOL	Bit	0.30	0.36	0.33
					SBIL	Bit	0.37	0.42	0.39
	41041	M 21 BR from 0.75 to 0.95 (P. M. RR (G01 of 41041). 0.75) City of Grandville	33	42	EBOL	Bit	0.38	0.41	0.39
					EBIL	Bit	0.39	0.43	0.42
					WBOL	Bit	0.43	0.44	0.44
					WBIL	Bit	0.42	0.44	0.43
	41042	M 21 BR from 3.86 to 4.06 (Hall, 4.06) City of Grand Rapids	30	30	EB	Bit	0.38	0.40	0.39
					WB	Bit	0.41	0.41	0.41
	41081	M 45 from 5.22 to 5.42 (Lexington 5.41) in Grand Rapids	37	27	EB	Bit	0.32	0.34	0.33
					WB	Bit	0.35	0.39	0.37
	41081	M 45 from 5.82 to 6.02 (Market, 5.88) City of Grand Rapids	31	32	EBOL	Bit	0.43	0.44	0.44
					EBIL	Bit	0.41	0.44	0.43
					WBOL	Bit	0.44	0.46	0.45
					WBIL	Bit	0.41	0.46	0.43
	41131	US 131 from 10.18 to 10.38 (M 11, 10.15) City of Wyoming	42	38	NBOL	Conc	0.42	0.43	0.43
					NBCL	Conc	0.42	0.44	0.43
					NBIL	Conc	0.51	0.52	0.51
					SBOL	Conc	0.40	0.45	0.42
					SBIL	Conc	0.41	0.44	0.43
	41131	US 131 from 10.99 to 11.19 (Burton, 11.19) City of Grand Rapids	41	42	NBOL	Conc	0.39	0.43	0.41
					NBCL	Conc	0.39	0.40	0.40
					NBIL	Conc	0.40	0.46	0.42
					SBOL	Conc	0.45	0.50	0.47
					SBCL	Conc	0.40	0.42	0.41
					SBIL	Conc	0.42	0.43	0.43
	41131	US 131 from 11.97 to 12.17 (Hall St, 12.17) City of Grand Rapids	33	33	NBOL	Conc	0.41	0.44	0.43
					NBCL	Conc	0.39	0.40	0.40
					NBIL	Conc	0.40	0.42	0.41
					SBOL	Conc	0.40	0.41	0.40
					SBCL	Conc	0 39	0.39	0.39
					SBIL	Conc	0.41	0.44	0.42

TABLE 26 (Cont.)
HIGH ACCIDENT LOCATIONS FOR DISTRICTS 3, 5, 6, 7, 8, AND METRO

DISTRICT 5 CONT.

Control Section	Location and Mileage	1973 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Kent County (Cont.)								
41131	US 131 from 12.49 to 12.69 (Franklin St, 12.69) City of Grand Rapids	36	36	NBOL	Conc	0.38	0.39	0.39
				NBCL	Conc	0.36	0.40	0.39
				NBIL	Conc	0.38	0.41	0.40
				SBOL	Conc	0.35	0.38	0.37
				SBCL	Conc	0.36	0.39	0.38
				SBIL	Conc	0.42	0.44	0.43
41131	US 131 from 12.98 to 13.18 (Wealthy St, 13.23) City of Grand Rapids	33	45	NBOL	Conc	0.38	0.39	0.38
				NBCL	Conc	0.38	0.41	0.40
				NBIL	Conc	0.39	0.42	0.41
				SBOL	Conc	0.39	0.41	0.40
				SBCL	Conc	0.36	0.38	0.37
				SBIL	Conc	0.40	0.45	0.42
41131	US 131 from 13.19 to 13.39 (Wealthy St, 13.23) City of Grand Rapids	86	42	NBOL	Conc	0.33	0.38	0.36
				NBCL	Conc	0.37	0.39	0.38
				NBIL	Conc	0.43	0.43	0.43
				SBOL	Conc	0.37	0.40	0.38
				SBCL	Conc	0.34	0.37	0.37
				SBIL	Conc	0.37	0.41	0.39
41131	US 131 from 13.42 to 13.62 (Market St, 13.66) City of Grand Rapids	32	78	NBOL	Conc	0.36	0.39	0.37
				NBCL	Conc	0.36	0.37	0.37
				NBIL	Conc	0.38	0.43	0.40
				SBOL	Conc	0.36	0.42	0.40
				SBCL	Conc	0.32	0.37	0.35
				SBIL	Conc	0.34	0.38	0.35
41131	US 131 from 13.63 to 13.83 (Market St, 13.66) City of Grand Rapids	49	51	NBOL	Conc	0.38	0.40	0.39
				NBCL	Conc	0.34	0.38	0.36
				NBIL	Conc	0.34	0.38	0.35
				SBOL	Conc	0.35	0.35	0.35
				SBCL	Conc	0.38	0.38	0.38
				SBIL	Conc	0.38	0.43	0.41
41131	US 131 from 13.91 to 14.11 (Pearl St 14.16) City of Grand Rapids	32	31	NBOL	Conc	0.40	0.41	0.41
				NBCL	Conc	0.39	0.41	0.40
				NBIL	Conc	0.43	0.46	0.45
				SBOL	Conc	0.39	0.41	0.40
				SBCL	Conc	0.39	0.41	0.40
				SBIL	Conc	0.41	0.43	0.42
41131	US 131 from 14.13 to 14.33 (Pearl St, 14.16) City of Grand Rapids	30	40	NBOL	Conc	0.40	0.42	0.41
				NBCL	Conc	0.36	0.37	0.37
				NBIL	Conc	0.40	0.44	0.41
				SBOL	Conc	0.37	0.41	0.39
				SBCL	Conc	0.38	0.41	0.39
				SBIL	Conc	0.43	0.46	0.44
Muskegon County								
61022	M 46 from 0.38 to 0.58 (Spring St, 0.48) City of Muskegon	31	29	EBOL	Bit	0.42	0.47	0.45
				EBIL	Bit	0.41	0.45	0.43
				WBOL	Bit	0.45	0.49	0.47
				WBIL	Bit	0.44	0.48	0.46
61022	M 46 from 0.68 to 0.88 (Wood Ave, 0.78) City of Muskegon	30	27	EBOL	Bit	0.39	0.45	0.42
				EBIL	Bit	0.50	0.52	0.51
				WBOL	Bit	0.47	0.51	0.49
				WBIL	Bit	0.46	0.50	0.48
61023	M 46 from 0.03 to 0.23 (Sauter St, 0.21) Muskegon Twp.	36	12	EBOL	Bit	0.30	0.31	0.30
				EBIL	Bit	0.39	0.41	0.40
				WBOL	Bit	0.35	0.37	0.36
				WBIL	Bit	0.42	0.44	0.43

TABLE 26 (Cont.)
HIGH ACCIDENT LOCATIONS FOR DISTRICTS 3, 5, 6, 7, 8, AND METRO

	Control Section	Location and Mileage	1973 Accidents Total	1973 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
DISTRICT 5 CONT.		Newaygo County							
	62011	M 82 from 4.53 to 4.73 (Division, 4.66) City of Fremont	32	31	EBOL	Bit	0.27	0.30	0.29
					WBOL	Bit	0.25	0.27	0.26
					LT *	Bit	0.36*	0.41*	0.39*
		Ottawa County							
	70014	US 31 from 6.42 to 6.60 (Pennoyer, 6.42) City of Grand Haven	52	33	NBOL	Conc	0.36	0.37	0.36
					NBIL	Conc	0.40	0.41	0.41
					SBOL	Conc	0.35	0.38	0.37
					SBIL	Conc	0.36	0.40	0.38
	* This lane was tested EB and WB; combination wsf values are reported.								
DISTRICT 6		Genesee County							
	25052	M 54 BR from 0.00 to 0.40 (M 56 (Court), 0.00) City of Flint	59	34	NBOL	Brick	0.23	0.28	0.26
					NBIL	Brick	0.21	0.25	0.23
					SBOL	Brick	0.22	0.25	0.24
					SBIL	Brick	0.14	0.25	0.22
		Saginaw County							
	73073	M 58 from 2.85 to 3.05 (Hemmeter, 3.05) in Saginaw Twp	40	38	EBOL	Conc	0.32	0.34	0.33
					EBIL	Conc	0.28	0.30	0.29
					WBOL	Conc	0.30	0.36	0.34
					WBCL	Conc	0.36	0.38	0.37
					WBIL	Bit	0.33	0.38	0.36
	73073	M 58 from 3.25 to 3.45 (Bock Rd, 3.41) in Saginaw Twp	35	31	EBOL	Conc	0.35	0.36	0.35
					EBIL	Conc	0.26	0.29	0.28
					WBOL	Conc	0.28	0.31	0.29
					WBCL	Conc	0.33	0.36	0.34
					WBIL	Bit	0.33	0.37	0.35
	73073	M 58 from 4.10 to 4.30 (Weinecke Rd, 4.30) in Saginaw Twp	40	25	EBOL	Conc	0.33	0.35	0.34
					EBIL	Conc	0.32	0.34	0.33
					WBOL	Conc	0.34	0.36	0.35
					WBCL	Conc	0.37	0.42	0.39
					WBIL	Bit	0.43	0.44	0.43
DISTRICT 7		Berrien County							
	11013	BL 94 from 0.54 to 0.74 (Riverview, 0.73) City of Benton Harbor	30	33	EBOL	Bit	0.44	0.47	0.45
					EBIL	Bit	0.36	0.38	0.37
					WBOL	Bit	0.40	0.42	0.41
					WBIL	Bit	0.27	0.30	0.28
	11013	BL 94 from 1.14 to 1.34 (Eigth St, 1.28) City of Benton Harbor	31	32	EBOL	Bit	0.41	0.44	0.42
					EBIL	Bit	0.41	0.42	0.41
					WBOL	Bit	0.39	0.41	0.40
					WBIL	Bit	0.43	0.45	0.44
	11013	BL 94 from 1.35 to 1.52 (Sixth St, 1.50) City of St. Joseph	50	30	EBOL	Bit	0.38	0.42	0.41
					EBIL	Bit	0.41	0.44	0.42
					WBOL	Bit	0.41	0.43	0.42
					WBIL	Bit	0.41	0.42	0.41
	11013	BL 94 from 1.64 to 1.84 (Fourth St, 1.64) City of Benton Harbor	42	31	EBOL	Bit	0.41	0.42	0.42
					EBIL	Bit	0.42	0.44	0.43
					WBOL	Bit	0.40	0.42	0.41
					WBIL	Bit	0.37	0.41	0.38

TABLE 26 (Cont.)
HIGH ACCIDENT LOCATIONS FOR DISTRICTS 3, 5, 6, 7, 8, AND METRO

DISTRICT 7 CONT.

Control Section	Location and Mileage	1973 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Berrien County (Cont.)								
11013	BL 94 from 2.13 to 2.33 (Seely Ave, 2.27) City of Benton Harbor	33	24	EB	Bit	0.47	0.48	0.48
				WB	Bit	0.41	0.44	0.43
11031	US 31 - M 139 from 3.14 to 3.34 (Napier, 3.39) Benton Twp	37	32	NBOL	Conc	0.33	0.33	0.33
				NBIL	Conc	0.33	0.35	0.34
				NBRT	Conc	0.35	0.38	0.36
				SBOL	Conc	0.34	0.37	0.35
				SBIL	Conc	0.36	0.38	0.37
11031	US 31 - M 139 from 3.79 to 3.99 (Indiana, 3.79) Benton Twp	32	44	NBOL	Conc	0.35	0.38	0.36
				NBIL	Conc	0.33	0.36	0.35
				SBOL	Conc	0.38	0.39	0.38
				SBIL	Conc	0.36	0.38	0.37
Branch County								
12022	US 12 from 0.00 to 0.18 (BL 69, Marshall 0.00) City of Coldwater	49	39	EBOL	Conc	0.36	0.38	0.37
				EBIL	Conc	0.35	0.36	0.35
				WBOL	Conc	0.35	0.35	0.35
				WBIL	Conc	0.34	0.36	0.35
Calhoun County								
13061	M 37 (Michigan) from 4.43 to 4.62 (20th St, 4.61) City of Battle Creek	42	38	EBOL	Bit	0.50	0.52	0.51
				EBIL	Bit	0.51	0.55	0.53
				WBOL	Bit	0.44	0.49	0.46
				WBIL	Bit	0.53	0.55	0.54
Kalamazoo County								
39041	BL 94 (Stadium) from 3.70 to 3.88 (M 43, Main, 3.82) City of Kalamazoo	41	46	1958 Construction				
				EBOL	Bit	0.27	0.29	0.28
				EBCL	Bit	0.27	0.33	0.31
				EBIL	Bit	0.31	0.31	0.31
				WBOL	Bit	0.27	0.30	0.28
				WBCL	Bit	0.26	0.27	0.27
				WBIL	Bit	0.24	0.30	0.28
				WBOL	Conc	0.35	0.38	0.36
				WBCL	Conc	0.34	0.36	0.35
				WBIL	Conc	0.35	0.37	0.36
				1965 Construction				
				EBOL	Bit	0.42	0.44	0.43
				EBCL	Bit	0.39	0.41	0.40
				EBIL	Bit	0.45	0.47	0.46
39042	M 43 (Michigan) from 0.00 to 0.20 (US 131 BR, Park, 0.10) City of Kalamazoo	120	31	1958 Construction				
				EBOL	Bit	0.25	0.28	0.26
				EB#4	Bit	0.26	0.30	0.28
				EB#3	Bit	0.29	0.30	0.29
				EB#2	Bit	0.29	0.30	0.30
				EBIL	Bit	0.28	0.29	0.29
				1967 Construction				
				EBOL	Bit	0.40	0.42	0.41
				EB#4	Bit	0.38	0.41	0.39
				EB#3	Bit	0.44	0.45	0.44
				EB#2	Bit	0.40	0.43	0.41
				EBIL	Bit	0.42	0.47	0.44
39081	M 43 from 7.02 to 7.22 (Cherryhill, 7.10) Kalamazoo Twp	40	45	EBOL	Conc	0.31	0.33	0.32
				EBIL	Conc	0.37	0.37	0.37
				WBOL	Conc	0.36	0.36	0.36
				WBIL	Conc	0.35	0.38	0.36
39081	M 43 from 7.76 to 7.94 (Dartmouth, 7.87) Kalamazoo Twp	36	39	EBOL	Conc	0.32	0.34	0.33
				EBIL	Conc	0.35	0.36	0.36
				WBOL	Conc	0.33	0.34	0.34
				WBIL	Conc	0.34	0.37	0.36
39082	M 43 (Michigan) from 0.21 to 0.40 (Riverview, 0.23) City of Kalamazoo	50	32	NBOL	Conc	0.35	0.36	0.36
				NBIL	Conc	0.34	0.36	0.35
				SBOL	Conc	0.32	0.36	0.34
				SBIL	Conc	0.36	0.39	0.37

TABLE 26 (Cont.)
HIGH ACCIDENT LOCATIONS FOR DISTRICTS 3, 5, 6, 7, 8, AND METRO

DISTRICT 8

Control Section	Location and Mileage	1973 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Ingham County								
33011	M 99 from 3.67 to 3.85 (Holmes Rd, 3.66) City of Lansing	41	51	NBOL	Conc	0.27	0.28	0.27
				NBIL	Bit	0.33	0.36	0.35
				SBOL	Conc	0.28	0.31	0.29
				SBIL	Bit	0.36	0.41	0.39
33042	EB M 43 (Saginaw) from 0.23 to 0.43 (Pennsylvania Ave, 0.33) City of Lansing	32	37	EBOL	Conc	0.28	0.33	0.30
				EB#4	Conc	0.29	0.34	0.32
				EB#3	Conc	0.35	0.35	0.35
				EB#2	Conc	0.30	0.30	0.30
				EBIL	Conc	0.29	0.34	0.31
				EBOL	Bit	0.34	0.37	0.36
				EB#3	Bit	0.38	0.42	0.40
				EB#2	Bit	0.42	0.43	0.42
				EBIL	Bit	0.38	0.41	0.40
				CD Roads				
33045	I 496 from 0.03 to 0.23 (Cedar St, Interchange, 0.13) City of Lansing	40	35	EBOL	Conc	0.19	0.23	0.21
				EBCL	Conc	0.21	0.22	0.22
				EBIL	Conc	0.22	0.27	0.25
				WBOL	Conc	0.16	0.21	0.18
				WBCL	Conc	0.28	0.28	0.28
				WBIL	Conc	0.26	0.30	0.28
				Mainline				
				EBOL	Conc	0.22	0.26	0.24
				EBIL	Conc	0.27	0.28	0.28
				WBOL	Conc	0.30	0.33	0.32
				WBIL	Conc	0.32	0.34	0.33
33045	I 496 from 0.33 to 0.43 (Exit to WB CD Lane, 0.36) City of Lansing	9	44	WBOL	Conc	0.18	0.22	0.20
				WBIL	Conc	0.23	0.27	0.25
33061	M 43 (Saginaw) from 2.00 to 2.20 (Pine St, 2.19) City of Lansing	36	39	EBOL	Bit	0.34	0.40	0.37
				EB#3	Bit	0.39	0.41	0.40
				EB#2	Bit	0.38	0.41	0.39
				EBIL	Bit	0.37	0.41	0.38
33061	M 43 from 2.50 to 2.69 (Capitol Ave, 2.51) City of Lansing	53	32	EBOL	Bit	0.39	0.43	0.41
				EB#3	Bit	0.37	0.43	0.41
				EB#2	Bit	0.40	0.42	0.41
				EBIL	Bit	0.39	0.41	0.40
				EBOL	Conc	0.31	0.35	0.33
				EB#4	Conc	0.29	0.34	0.32
				EB#3	Conc	0.31	0.34	0.32
				EB#2	Conc	0.30	0.34	0.32
				EBIL	Conc	0.32	0.36	0.34
33081	BL 96 (Grand River) from 1.41 to 1.61 (Logan St, 1.51) City of Lansing	33	45	EBOL	Bit	0.37	0.37	0.37
				EBIL	Bit	0.39	0.41	0.40
				WBOL	Bit	0.34	0.39	0.35
				WBIL	Bit	0.39	0.43	0.41
Monroe County								
				North of Third St				
58071	M 125 from 14.59 to 14.79 (Third St, 14.60) City of Monroe	35	49	NBOL	Bit	0.27	0.28	0.27
				NBIL	Bit	0.39	0.42	0.41
				SBOL	Bit/conc*	0.26	0.30	0.29
				SBIL	Bit	0.27	0.30	0.28
				North of Second St				
				NBOL	Bit	0.41	0.44	0.43
				NBIL	Bit	0.41	0.43	0.42
				SBOL	Bit	0.33	0.36	0.34
				SBIL	Bit	0.30	0.32	0.31

* Right half of lane is concrete, left half of lane is bituminous.

TABLE 26 (Cont.)
HIGH ACCIDENT LOCATIONS FOR DISTRICTS 3, 5, 6, 7, 8, AND METRO

METRO DISTRICT

Control Section	Location and Mileage	1973 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Macomb County								
50011	M 53 from 3.28 to 3.48 (Farnum, 3.31) City of Warren	32	44	NBOL	Bit	0.31	0.35	0.33
				NBCL	Bit	0.34	0.38	0.36
				NBIL	Bit	0.30	0.35	0.33
				SBOL	Bit	0.36	0.40	0.38
				SBCL	Bit	0.38	0.42	0.40
				SBIL	Bit	0.41	0.44	0.42
50011	M 53 from 3.49 to 3.67 (Martin, 3.49) City of Warren	30	40	NBOL	Bit	0.38	0.43	0.41
				NBCL	Bit	0.36	0.41	0.38
				NBIL	Bit	0.38	0.40	0.39
				SBOL	Bit	0.33	0.36	0.34
				SBCL	Bit	0.38	0.39	0.38
				SBIL	Bit	0.37	0.43	0.41
50011	M 53 from 4.17 to 4.33 (Racine, 4.22) City of Warren	30	43	NBOL	Conc	0.29	0.34	0.31
				NBCL	Conc	0.32	0.36	0.35
				NBIL	Conc	0.32	0.36	0.34
				SBOL	Conc	0.36	0.39	0.37
				SBCL	Conc	0.33	0.37	0.35
				SBIL	Conc	0.37	0.38	0.38
50011	M 53 from 9.84 to 10.04 (18 Mile Rd, 10.04) City of Sterling Heights	42	31	NBOL	Conc	0.31	0.34	0.33
				NBIL	Conc	0.33	0.35	0.34
				SBOL	Conc	0.30	0.34	0.32
				SBIL	Conc	0.33	0.35	0.34
50031	M 97 from 5.93 to 6.08 (Utica Rd, 6.05) City of Frazer	71	32	NBOL	Bit	0.41	0.44	0.43
				NBIL	Bit	0.41	0.45	0.43
				SBOL	Bit	0.46	0.51	0.48
				SBCL	Bit	0.43	0.45	0.44
				SBIL	Bit	0.44	0.45	0.44
50031	M 97 from 8.13 to 8.31 (15 Mile Rd, 8.28) Clinton Twp	77	32	NBOL	Conc	0.30	0.33	0.31
				NBIL	Bit	0.34	0.38	0.35
				SBOL	Conc	0.31	0.32	0.31
				SBIL	Bit	0.37	0.41	0.39
Oakland County								
63041	M 59 from 12.65 to 12.85 (S Williams Lake Rd, 12.75) City of Pontiac	31	58	EBOL	Conc	0.31	0.34	0.33
				EBIL	Conc	0.32	0.33	0.33
				WBOL	Conc	0.37	0.40	0.38
				WBIL	Conc	0.34	0.36	0.35
63041	M 59 from 12.87 to 13.04 (N Williams Lake Rd, 12.99) City of Pontiac	33	45	EBOL	Conc	0.35	0.36	0.36
				EBIL	Conc	0.33	0.35	0.34
				WBOL	Conc	0.31	0.33	0.32
				WBIL	Conc	0.28	0.30	0.29
63041	M 59 from 19.80 to 20.00 (Murphy, 19.85) City of Pontiac	30	43	EBOL	Conc	0.30	0.33	0.32
				EBIL	Conc	0.32	0.36	0.34
				WBOL	Conc	0.33	0.35	0.34
				WBCL	Conc	0.30	0.33	0.32
				WBIL	Conc	0.33	0.36	0.34
63053	US 10 from 3.64 to 3.82 (Hatchery Rd, 3.72) Waterford Twp	38	32	NBOL	Bit	0.45	0.47	0.46
				NBIL	Bit	0.51	0.53	0.52
				SBOL	Bit	0.42	0.43	0.43
				SBIL	Bit	0.44	0.49	0.47
63091	BL 75 from 0.87 to 1.06 (Hammond, 0.87) City of Pontiac	36	42	1974 Bit Conc Resurfacing				
				NBOL	Bit	0.43	0.44	0.44
				NBIL	Bit	0.39	0.41	0.40
				SBOL	Bit	0.44	0.46	0.45
				SBIL	Bit	0.40	0.43	0.41
63151	BL 75 - US 10 BR from 1.57 to 1.77 (Wilson St, 1.60) City of Pontiac	47	32	NBOL	Bit	0.43	0.47	0.45
				NBCL	Bit	0.47	0.48	0.47
				NBIL	Bit	0.43	0.46	0.44
				SBOL	Bit	0.44	0.48	0.46
				SBCL	Bit	0.43	0.46	0.44
				SBIL	Bit	0.42	0.45	0.44

TABLE 26 (Cont.)
HIGH ACCIDENT LOCATIONS FOR DISTRICTS 3, 5, 6, 7, 8, AND METRO

METRO DISTRICT CONT.

Control Section	Location and Mileage	1973 Accidents Total	1973 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
Wayne County								
82022	I 94 from 16.68 to 16.88 (US 12, Michigan, 16.86) City of Dearborn	30	40	EBOL	Bit	0.37	0.42	0.40
				EBCL	Bit	0.46	0.47	0.47
				EBIL	Bit	0.54	0.59	0.56
				WBOL	Bit	0.51	0.53	0.52
				WBCL	Bit	0.50	0.51	0.50
				WBIL	Bit	0.59	0.61	0.60
82052	US 24 from 6.94 to 7.14 (Wick, 7.12) City of Taylor	38	37	NBOL	Bit	0.38	0.41	0.40
				NBCL	Bit	0.45	0.47	0.46
				NBIL	Bit	0.44	0.47	0.46
				SBOL	Bit	0.33	0.36	0.35
				SBCL	Bit	0.44	0.46	0.45
				SBIL	Bit	0.43	0.46	0.44
				SBOL	Conc	0.35	0.38	0.36
				SBCL	Conc	0.38	0.40	0.39
				SBIL	Conc	0.36	0.36	0.36
82052	US 24 from 8.00 to 8.7 (Cypress, 8.44) City of Taylor	30	30	NBRT	Conc	0.27	0.31	0.30
				NB#3	Conc	0.23	0.25	0.24
				NB#2	Conc	0.17	0.22	0.20
				NBIL	Conc	0.21	0.26	0.24
				SBRT	Conc	0.23	0.26	0.24
				SB#3	Conc	0.24	0.27	0.25
				SB#2	Conc	0.25	0.25	0.25
				SBIL	Conc	0.21	0.24	0.23
82053	US 24 from 1.91 to 2.11 (Midway, 2.09) City of Dearborn Heights	37	41	NBOL	Bit	0.32	0.35	0.33
				NB#3	Bit	0.34	0.36	0.35
				NB#2	Bit	0.36	0.38	0.37
				NBIL	Bit	0.40	0.47	0.43
				SBOL	Bit	0.30	0.36	0.33
				SBCL	Bit	0.30	0.32	0.31
				SBIL	Bit	0.35	0.36	0.35
				SBOL	Conc	0.30	0.30	0.30
				SBCL	Conc	0.26	0.29	0.28
				SBIL	Conc	0.32	0.33	0.32
82053	US 24 from 2.25 to 2.45 (Hass, 2.44) City of Dearborn Heights	36	42	NBOL	Bit	0.33	0.36	0.35
				NB#3	Bit	0.30	0.35	0.33
				NB#2	Bit	0.37	0.39	0.38
				NBIL	Bit	0.34	0.39	0.37
				SBOL	Conc	0.27	0.30	0.29
				SBCL	Conc	0.30	0.32	0.31
				SBIL	Conc	0.29	0.30	0.30
82061	US 12 from 8.41 to 8.59 (Wayne Rd, 8.50) City of Wayne	36	33	EBOL	Conc	0.34	0.38	0.36
				EB#3	Conc	0.37	0.38	0.37
				EB#2	Conc	0.36	0.40	0.38
				EBIL	Conc	0.34	0.36	0.35
				WBOL	Bit	0.48	0.51	0.49
				WBCL	Bit	0.44	0.48	0.46
				WBIL	Bit	0.51	0.51	0.51
82061	US 12 from 11.22 to 11.42 (Middlebelt, 11.45) City of Inkster	64	30	EBOL	Bit	0.40	0.43	0.41
				EBIL	Bit	0.38	0.42	0.40
				WBOL	Bit	0.42	0.45	0.43
				WBCL	Bit	0.42	0.45	0.43
				WBIL	Bit	0.50	0.54	0.52
82081	M 153 from 11.84 to 12.04 (Inkster Rd, 12.02) City of Garden City	61	34	EBOL	Bit	0.30	0.32	0.31
				EBIL	Bit	0.27	0.31	0.29
				WBOL	Bit	0.28	0.31	0.30
				WBIL	Bit	0.32	0.35	0.33
82081	M 153 from 13.46 to 13.66 (Kingsbury, 13.65) Cities of Dearborn and Dearborn Heights	37	35	EBOL	Conc	0.30	0.34	0.33
				EBCL	Conc	0.29	0.35	0.32
				EBIL*	Conc	0.42	0.47	0.44
				WBOL	Conc	0.23	0.28	0.26
				WBCL	Conc	0.29	0.31	0.30
				WBIL*	Conc	0.42	0.44	0.43

*Inside lanes still had curing compound on them.

TABLE 26 (Cont.)
HIGH ACCIDENT LOCATIONS FOR DISTRICTS 3, 5, 6, 7, 8, AND METRO

METRO DISTRICT CONT.

Control Section	Location and Mileage	1973 Accidents Total	1973 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
Wayne County (Cont.)								
82121	BS 96 from 1.19 to 1.39 (Beech-Daly, 1.39) Redford Twp	37	32	EBOL	Bit	0.16	0.21	0.19
				EB#3	Bit	0.17	0.20	0.19
				EB#2	Bit	0.18	0.20	0.19
				EBIL	Bit	0.22	0.27	0.25
				WBOL	Bit	0.36	0.39	0.38
				WB#3	Bit	0.34	0.35	0.35
				WB#2	Bit	0.33	0.34	0.33
				WBIL	Bit	0.37	0.39	0.37
82142	M 102 from 0.00 to 0.18 (US 10, 0.00) and the CD roads. Cities of Detroit, Southfield and Oak Park	45	38	M 102				
				EBOL	Conc	0.42	0.47	0.44
				EBCL	Conc	0.45	0.47	0.46
				EBIL	Conc	0.44	0.49	0.47
				WBOL	Conc	0.38	0.40	0.39
				WBCL	Conc	0.38	0.42	0.40
				WBIL	Conc	0.40	0.41	0.41
				CD Roads				
				EBOL	Conc	0.36	0.41	0.39
				EBCL	Conc	0.39	0.45	0.41
				EBIL	Conc	0.38	0.43	0.41
				WBOL	Conc	0.37	0.38	0.38
				WBCL	Conc	0.38	0.39	0.38
				WBIL	Conc	0.36	0.37	0.37
82211	M 85 from 6.05 to 6.25 (King Rd, 6.17) Cities of Trenton and Riverview	37	35	NBOL	Conc	0.36	0.37	0.36
				NBIL	Conc	0.36	0.39	0.37
				SBOL	Conc	0.32	0.36	0.34
				SBIL	Conc	0.36	0.38	0.37
82211	M 85 from 8.12 to 8.32 (Pennsylvania, 8.18) Cities of Riverview and Southgate	72	31	NBOL	Bit	0.40	0.44	0.41
				NBIL	Bit	0.46	0.51	0.49
				SBRT	Bit	0.47	0.50	0.49
				SBOL	Bit	0.44	0.47	0.46
				SBIL	Bit	0.36	0.43	0.40

SECTION VI

SPECIAL REQUEST TESTS

Special Request Tests

During the course of the year, requests for skid tests are received from field personnel or through the Design, Maintenance, Traffic and Safety, or Testing and Research Divisions. These requests receive priority considerations during scheduling of skid tests. Friction data are forwarded to the person or agency initiating the request as soon as possible after completion of field measurements.

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 17, 1974

To: L. J. Doyle
Asst. Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests at Three Proposed New Signal Locations in Dickinson and Menominee Counties. Research Project 54 G-74, 74 SR-1

In accord with your November 13, 1973 request, skid tests have been conducted at three proposed new signal locations in Dickinson and Menominee Counties. Results of May 7, 1974 tests are listed below for your review.

Location	Route	Surface Type	Lane	Coefficient of Wsf		
				Low	High	Avg
US-41 at M-35	M-35	Conc	SBOL	0.32	0.36	0.34
	M-35	Conc	SBIL	0.29	0.32	0.30
	US-41	Conc	NBOL	0.27	0.30	0.28
	US-41	Conc	NBIL	0.32	0.34	0.33
	US-41	Conc	SBOL	0.26	0.27	0.27
	US-41	Conc	SBIL	0.30	0.30	0.30
US-2 at US-141	US-2	Bit	EBOL	0.47	0.50	0.48
	US-2	Bit	EBIL	0.46	0.50	0.48
	US-2	Conc	WBOL	0.37	0.39	0.38
	US-2	Conc	WBIL	0.40	0.42	0.41
	US-141	Bit	NB	0.51	0.52	0.52
US-2 - US-141 at M-95	US-2 - US-141	Bit	EBOL	0.52	0.55	0.54
	US-2 - US-141	Bit	EBIL	0.51	0.51	0.52
	US-2 - US-141	Bit	WBOL	0.48	0.51	0.49
	US-2 - US-141	Bit	WBIL	0.53	0.55	0.54
	M-95	Bit	SB	0.47	0.51	0.49

TESTING AND RESEARCH DIVISION

L. Roy T. Oehler
Engineer of Research

LTO:PMS:cgc

cc: K. A. Allemeier
E. L. Martin
R. A. Rigotti

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 17, 1974

To: L. J. Doyle
Asst. Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on B01 of 22021
Research Project 54 G-74, 74 SR-2

Friction levels were determined May 7, 1974 on the US-2 - US-141 structure over the Menominee River. Tests were conducted in response to your November 13, 1973 request. Friction levels on this seal coat surface ranged from 0.26 to 0.30 and averaged 0.28.

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:cgc

cc: K. A. Allemeier
A. J. Marusich

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 17, 1974

To: Max N. Clyde
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on X01 of 22012 and Follow Up Skid Tests on B01 of 49023.
Research Project 54 G-74, 74 SR-3

In response to your request dated October 29, 1973, skid tests have been conducted on subject structures.

Friction levels ranging from 0.34 to 0.38 and averaging 0.36 were determined May 7, 1974 on the M-95 structure over a private railroad (X01 of 22012), 7.9 miles south of M-69.

The bauxite grit epoxy seal treatment scheduled for the deck of US-2 over the Cut River has not yet been accomplished. Skid tests were conducted on the concrete surface May 6, 1974. Resulting wsf values ranged from 0.19 to 0.23 and averaged 0.21. As soon as the new surface is applied, additional skid tests will be conducted and results transmitted.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:cgc

cc: J. F. Oravec
A. J. Marusich
E. L. Martin
P. A. Michelin
J. Kantellitsas
K. A. Allemeier

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 8, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on the US 2 Bridge over Cut River, 4.3 miles NW of Brevort. Research Project 54 G-74, 74 SR-3a.

In accord with a October 29, 1973 request from Max N. Clyde, skid tests have been made on the July 1974 epoxy and bauxite surfacing of the Cut River Bridge. Testing was conducted September 23, 1974 on the deck and approaches to the structure. Results are shown below:

Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
East of Bridge	Bituminous	EB	0.43	0.48	0.45
		WB	0.56	0.60	0.58
On Bridge	Epoxy and Bauxite	EB	0.75	0.81	0.77
		WB	0.78	0.82	0.80
West of Bridge	Bituminous	EB	0.51	0.56	0.54
		WB	0.58	0.61	0.59

TESTING AND RESEARCH DIVISION

Ray T. Oehler
Engineer of Research

LTO:PMS:bf

cc: J. F. Oravec
A. J. Marusich
E. L. Martin
J. Kantellitsas
K. A. Allemeier

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

April 25, 1974

To: K. A. Allemeier
Acting Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on M 36 Between Mason and M 52 (Project Mb 33021-04774A). Research Project 54 G-74. 74 SR-4.

Skid tests were conducted twice during 1973 on the subject project. Test results were subsequently submitted to you in letters dated 9-5-73 (73 SA-2) and 12-7-73 (73 SA-2A Spring tests on this M 36 roadway were measured 4-22-74. Fifty-four of the fifty-five tests conducted yielded wsf values ranging from 0.34 to 0.52 and averaging 0.43. The remaining test was in the 100-ft acceleration area westbound from Every Rd. where a wsf value of 0.24 was determined.

TESTING AND RESEARCH DIVISION

L. Ray T. Oehler

Engineer of Research
Research Laboratory Section

LTO:PMS:nag

cc: P. J. Serafin

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

April 30, 1974

To: K. A. Allemeier
Acting Engineer of Testing & Research

From: L. T. Oehler

Subject: Spring Skid Tests on Napoleon Sandstone, Project No. 46061-04845A
Research Project 54 G-74, 74 SR-5

Additional skid tests were conducted April 4, 1974 on the experimental Napoleon Sandstone Surface located on US-223 in Lenawee County. Friction levels determined this date ranged from 0.47 to 0.59 and averaged 0.54. This friction level average is 29 percent higher than that determined during October, 1973. A historical summary of skid tests for this surface are attached.

Skid tests were also conducted on the conventional bituminous aggregate portion of Project No. MB 46061-04845A, located northwest of the experimental sections. Friction levels encountered ranged from 0.45 to 0.56 and averaged 0.49. The 0.49 average represents a 63 percent increase in the average wsf value since October, 1973.

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:cgc
Attachment

cc: P. J. Serafin

SKID TEST SUMMARY OF NAPOLEON SANDSTONE
Project Mb 46061-04845A

Mix No.	Blend No.	Station to Station	Direction	Coefficient of Wsf								
				August 23, 1973			October 17, 1973			April 4, 1974		
				Low	High	Avg	Low	High	Avg	Low	High	Avg
1	II	490+88 to 496+50	NB	0.34	0.38	0.36	0.28	0.34	0.30	0.55	0.59	0.57
2	II	486+50 to 490+88	NB	0.35	0.42	0.38	0.30	0.31	0.30	0.52	0.56	0.53
2	II	492+26 to 496+50	SB	0.50	0.55	0.53	0.37	0.41	0.38	0.58	0.59	0.59
3	II	484+20 to 492+26	SB	0.41	0.45	0.43	0.28	0.33	0.31	0.55	0.59	0.58
5	I	481+10 to 486+50	NB	0.30	0.32	0.31	0.26	0.31	0.29	0.48	0.48	0.48
6	I	476+50 to 481+10	NB	0.34	0.39	0.37	0.26	0.28	0.27	0.50	0.54	0.52
6	I	474+30 to 484+20	SB	0.40	0.42	0.41	0.22	0.26	0.25	0.54	0.56	0.55
7	III	466+50 to 476+50	NB	0.40	0.42	0.41	0.31	0.35	0.32	0.47	0.49	0.48
7	III	466+50 to 474+30	SB	0.37	0.40	0.39	0.25	0.29	0.27	0.51	0.54	0.53
9	IV	456+50 to 466+50	NB	0.45	0.47	0.46	0.31	0.35	0.33	0.49	0.50	0.50
9	IV	456+40 to 466+50	SB	0.46	0.52	0.49	0.32	0.36	0.34	0.54	0.58	0.57
10	V	446+50 to 456+50	NB	0.45	0.51	0.47	0.32	0.37	0.34	0.53	0.56	0.54
10	V	446+50 to 456+40	SB	0.48	0.51	0.49	0.29	0.34	0.32	0.56	0.59	0.58

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

April 30, 1974

To: Max N. Clyde
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests at I-75 - US-10 Junction in Bay County
Research Project 54 G-74, 74 SR-6

In accord with your December 11, 1973 request, wsf values have been measured at the I-75 - US-10 Junction. Skid tests were conducted April 3, 1974 and a wide friction level range of 0.31 to 0.73 was encountered. Data for the specific areas requested are shown below for your review.

Location	Surface Type	Lane	Coefficient of wsf Low	High	Avg.
Eastbound US-10 from Station 820 to 843	Conc	EBOL	0.48	0.51	0.49
	Conc	EBCL	0.38	0.40	0.39
	Conc	EBIL	0.47	0.50	0.48
	Bit	EBOL	0.63	0.66	0.65
	Bit	EBIL	0.69	0.73	0.71
Entire Length of Eastbound US-10 Ramp to Southbound I-75	Bit	EBOL	0.54	0.59	0.56
	Bit	EBIL	0.67	0.69	0.68
Northbound I-75 - US-23 from Station 955 to 975	Conc	NBOL	0.32	0.34	0.33
	Conc	NBIL	0.43	0.46	0.44
Entire Length of Northbound I-75 Ramp to Westbound US-10	Conc	NB	0.31	0.33	0.32

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:cgc

cc: K. A. Allemeier
D. P. McCarty

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

October 18, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: "Before" and "After" Skid Tests at 15 Pavement Grooving Locations.
Research Project 54 G-74, 74 SR-7.

In accord with a January 15, 1974 request from Max N. Clyde, skid tests have been conducted at all requested locations before and after pavement grooving. Results from these tests are attached for your review.

TESTING AND RESEARCH DIVISION

L. Ray T. Oehler
Engineer of Research

LTO:PMS:bf

Attachment

cc: K. A. Allemeier
P. A. Michelin
D. Van Hine
E. H. Miller
M. L. Jones
J. P. Neve
P. J. Riley

Control Section	Location	Type of Grooving	Lane	1974 Skid Test Date	Coefficient of Wsf					
					Before Grooving			After Grooving		
					Low	High	Avg	Low	High	Avg
02041	M 28 curve at Hickory St, City of Munising	Longitudinal 0.095 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	EBOL	5-7	0.31	0.35	0.33			
				9-25				0.39	0.42	0.41
			EBIL	5-7	0.33	0.36	0.34			
				9-25				0.36	0.39	0.37
			WBOL	5-7	0.37	0.39	0.38			
				9-25				0.41	0.43	0.42
			WBIL	5-7	0.34	0.36	0.35			
				9-25				0.36	0.38	0.37
09042	Eastbound M 25 curve at Thomas St, Bay County	Longitudinal 0.095 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	EBOL	4-3	0.44	0.45	0.44			
				8-23				0.35	0.36	0.36
			EBIL	4-3	0.39	0.44	0.42			
				8-23				0.44	0.46	0.45
50023	M 59 curve between Dequindre and Ryan Rd	Longitudinal 0.095 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	EBOL	5-2	0.23	0.27	0.25			
				8-2				0.30	0.31	0.30
			EBIL	5-2	0.22	0.28	0.25			
				8-2				0.38	0.42	0.40
			WBOL	5-2	0.20	0.26	0.24			
				8-2				0.31	0.32	0.31
			WBIL	5-2	0.21	0.23	0.22			
				8-2				0.31	0.33	0.32
62031	M 37 from Jefferson St to River St, City of Newaygo	Longitudinal 0.095 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	NBOL	4-29	0.31	0.36	0.34			
				7-31				0.34	0.38	0.36
			NBIL	4-29	0.30	0.34	0.32			
				7-31				0.33	0.35	0.34
			SBOL	4-29	0.29	0.35	0.32			
				7-31				0.32	0.34	0.33
			SBIL	4-29	0.34	0.36	0.35			
				7-31				0.33	0.37	0.35
			NBIL	4-29	0.51	0.55	0.53			
				7-31				0.54	0.58	0.56
			SBIL	4-29	0.51	0.53	0.52			
				7-31				0.51	0.53	0.52
11053	Northbound US 23 from Pleasant St to Ship St, City of St. Joseph	Transverse 0.095 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	NBOL	4-26	0.22	0.24	0.23			
				8-6				0.32	0.36	0.34
			NBIL	4-26	0.30	0.32	0.31			
				8-6				0.35	0.38	0.37

Control Section	Location	Type of Grooving	Lane	1974 Skid Test Date	Coefficient of Wsf					
					Before Grooving			After Grooving		
					Low	High	Avg	Low	High	Avg
23012 & 33041	US 27 approaches to Waverly Rd, Eaton and Ingham Counties	Transverse 0.095 in. wide 3/16 in. deep Center to Center Spacing 1-1/2 in.	NEBOL	4-25	0.33	0.34	0.34			
				7-25				0.30	0.31	0.30
			NEBIL	4-25	0.33	0.34	0.33			
				7-25				0.28	0.29	0.28
			NEBLT	4-25	0.47	0.53	0.49			
				7-25				0.34	0.38	0.36
			SWBOL	4-25	0.30	0.31	0.30			
				7-25				0.29	0.29	0.29
			SWBIL	4-25	0.33	0.36	0.34			
				7-25				0.29	0.30	0.30
56023	Eastbound M 20 at Ashman St, City of Midland	Transverse 0.095 in. wide 3/16 in. deep Center to Center Spacing 1 in.	EBOL	4-3	0.36	0.40	0.38			
				8-23				0.30	0.33	0.32
			EBCL	4-3	0.33	0.36	0.35			
				8-23				0.34	0.36	0.35
			EBIL	4-3	0.38	0.41	0.39			
				8-23				0.34	0.36	0.35
56023	Eastbound M 20 at Rodd St, City of Midland	Transverse 0.095 in. wide 3/16 in. deep Center to Center Spacing 1 in.	EBOL	4-3	0.38	0.39	0.39			
				8-23				0.29	0.31	0.30
			EBCL	4-3	0.36	0.39	0.37			
				8-23				0.35	0.36	0.36
			EBIL	4-3	0.34	0.37	0.36			
				8-23				0.33	0.38	0.36
56023	Eastbound M 20 at Cronkwright, City of Midland	Transverse 0.095 in. wide 3/16 in. deep Center to Center Spacing 1 in.	EBOL	4-3	0.38	0.40	0.39			
				8-23				0.31	0.35	0.33
			EBCL	4-3	0.36	0.38	0.37			
				8-23				0.36	0.38	0.37
			EBIL	4-3	0.33	0.35	0.34			
				8-23				0.36	0.40	0.38
76021	Eastbound M 78 at M 52	Transverse 0.095 in. wide 3/16 in. deep Center to Center Spacing 1-1/4 in.	EBOL	4-22	0.40	0.42	0.41			
				7-26				0.20	0.21	0.21
			EBIL	4-22	0.38	0.41	0.39			
				7-26				0.24	0.25	0.24

Control Section	Location	Type of Grooving	Lane	1974 Skid Test Date	Coefficient of Wsf					
					Before Grooving			After Grooving		
					Low	High	Avg	Low	High	Avg
81081	M 17 at Golfside, City of Ypsilanti	Transverse 1/8 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	EBOL	4-16	0.29	0.32	0.30			
				9-1				0.25	0.30	0.27
			EBIL	4-16	0.24	0.28	0.26			
				9-1				0.30	0.30	0.30
			WBOL	4-16	0.25	0.28	0.26			
				9-1				0.28	0.28	0.28
			WBIL	4-16	0.24	0.25	0.24			
				9-1				0.29	0.36	0.32
81081	M 17 at Hewitt St, City of Ypsilanti	Transverse 1/8 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	EBOL	4-16	0.32	0.35	0.33			
				9-1				0.32	0.36	0.33
			EBIL	4-16	0.24	0.26	0.25			
				9-1				0.31	0.33	0.32
			WBOL	4-16	0.30	0.35	0.33			
				9-1				0.34	0.37	0.36
			WBIL	4-16	0.26	0.30	0.27			
				9-1				0.35	0.39	0.36
81081	M 17 at Mansfield, City of Ypsilanti	Transverse 1/8 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	EBOL	4-16	0.30	0.30	0.30			
				9-1				0.30	0.34	0.32
			EBIL	4-16	0.23	0.26	0.24			
				9-1				0.31	0.34	0.32
			WBOL	4-16	0.29	0.31	0.30			
				9-1				0.32	0.35	0.34
			WBIL	4-16	0.26	0.28	0.27			
				9-1				0.34	0.37	0.36
81081	M 17 at Oakwood, City of Ypsilanti	Transverse 1/8 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	EBOL	4-16	0.31	0.34	0.33			
				9-1				0.31	0.35	0.34
			EBIL	4-16	0.22	0.24	0.23			
				9-1				0.31	0.36	0.34
			WBOL	4-16	0.27	0.29	0.28			
				9-1				0.33	0.35	0.34
			WBIL	4-16	0.26	0.31	0.29			
				9-1				0.32	0.36	0.33
81081	Eastbound M 17 at Summit St, City of Ypsilanti	Transverse 1/8 in. wide 3/16 in. deep Center to Center Spacing 3/4 in.	EBOL	4-16	0.33	0.36	0.35			
				9-1				0.28	0.31	0.29
			EBCL	4-16	0.33	0.34	0.34			
				9-1				0.23	0.25	0.24
			EBIL	4-16	0.34	0.34	0.34			
				9-1				0.22	0.27	0.25

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

STATE HIGHWAYS BUILDING - POST OFFICE DRAWER K - LANSING, MICHIGAN 48904

JOHN P. WOODFORD, DIRECTOR

May 7, 1974

Mr. Robert C. Barnes
Acting Director of Public Works
City of St. Joseph
Administrative Center
616-620 Broad Street
St. Joseph, Michigan 49085

Skid Tests at Nine Intersection Locations, City of St. Joseph
Research Project 54 G-74, 74 SR-8.

Dear Mr. Barnes:

In response to your January 21, 1974 request, skid tests were conducted April 26, 1974 at the nine locations that you designated. Testing was performed at the approach to each intersection as recommended by Michigan Department of State Highways and Transportation Report TSD-215-73. The attached data report 40 mph wet sliding coefficients of friction.

By copy of this letter, it is requested that this Department's Bureau of Finance bill the City of St. Joseph $75.00, the cost for testing.

TESTING AND RESEARCH DIVISION

K. A. Allemeier
Acting Engineer of Testing and Research

MICHIGAN
THE GREAT LAKE STATE

Skid Test Summary - City of St. Joseph
Arpil 26, 1974 Tests, Res. Proj. 54 G-74

Location Number	Intersection Location	Street Tested	Lane Tested	Surface Tested	40 mph Coeff of wsf Low	High	Avg.
1	Napier Avenue at Langley Ave.	Napier	EB	Bituminous	.31	.32	.32
		Napier	WB	Concrete	.30	.34	.32
		Langley	NB	Concrete	.36	.40	.38
		Langley	SBOL	Concrete	.37	.42	.40
		Langley	SBIL	Bituminous	.26	.28	.27
2	Broad Street at Court Street	Broad	EB	Bituminous	.30	.31	.30
		Broad	WB	Bituminous	.30	.31	.30
		Court	NB	Brick	.39	.41	.40
		Court	SB	Brick	.34	.38	.36
3	State Street at Broad Street	State	NB	Brick	.36	.36	.36
		State	SB	Brick	.35	.38	.36
		Broad	EB	Bituminous	.34	.37	.35
		Broad	WB	Brick	.21	.22	.21
4	State Street at Pleasant Street	State	NB	Brick	.35	.38	.36
		State	SB	Brick	.36	.40	.37
5	State Street at Ship Street	State	NB	Brick	.36	.38	.37
6	Broad Street at Wayne Street	Broad	EB	Bituminous	.30	.34	.32
		Broad	WB	Bituminous	.31	.34	.32
		Wayne	NB	Brick	.41	.44	.43
		Wayne	SB	Bituminous	.34	.35	.34
8	Pleasant Street at Court Street	Court	NB	Brick	.31	.36	.33
		Court	SB	Brick	.33	.36	.35
14	Winchester Ave. at State Street	Winchester	EB	Brick	.42	.44	.43
		Winchester	WB	Bituminous	.43	.48	.46
15	State Street at Elm Street	State	NB	Brick	.37	.38	.38
		State	SB	Brick	.36	.38	.37

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

STATE HIGHWAYS BUILDING – POST OFFICE DRAWER K – LANSING, MICHIGAN 48904

JOHN P. WOODFORD, DIRECTOR

May 22, 1974

Mr. Douglas Harwood
Highway and Traffic Systems Engineering
Midwest Research Institute
425 Volker Boulevard
Kansas City, Missouri 64110

Dear Mr. Harwood:

Pavement Skid Test Summary
Your Contract No. DOT-FH-11-8120
Our Research Project 54 G-74, 74 SR-9

"Before" pavement skid resistance measurements are completed for your tentative listings of test and control sites in Michigan. The attached data summary include all tests conducted within each described control section milepost limit. Follow-up "after" tests will be performed on all "test highway sites" and corresponding "control highway site" you designate.

Very truly yours,

TESTING AND RESEARCH DIVISION

K. A. Allemeier

K. A. Allemeier, P. E.
Acting Engineer of Testing & Research

MICHIGAN
THE GREAT LAKE STATE

Proposed Test Highway Sites
Skid Test Summary

Site No.	Control Section	Test Location - POB to POE Description and Milepost	Year Constructed and Surface Type	Test Direction and/or Lane	40 mph Coeff. of wsf
2	12022	0.5 mi. E. of Fiske Road, M.P. 2.5 - 2.8	1955 - Bit	EB	.49, .53, .49
			Bit	WB	.56, .55, .53
3	13011	S. of Kellogg Street, M. P. 0.4 - 0.6	1955 - Conc	NBOL	.31, .31, .34
			Bit	NBIL	.43, .42, .40
			Conc	SBOL	.39, .38, .36
			Bit	SBIL	.39, .38, .39
		S. of Kirby Road, M. P. 2.0 - 2.3	1959 - Bit	NB	.42, .42, .43
			Bit.	SB	.48, .46, .46
4	13022	0.5 mi. E. of Homer, M. P. 10.8 - 11.0	1974 - Bit	EB	.45, .47, .48
			Bit	WB	.45, .49, .50
		W. from M-99, M. P. 12.6 - 12.9	1958 - Bit	EBOL	.60, .64, .62
			Bit	EBIL	.65, .63, .68
			1957 - Bit	WBOL	.57, .56, .57
			Bit	WBIL	.75, .71, .73
		0.4 mi. E. of divided E. to 29 Mile Road, M. P. 13.8 - 14.0	1958 - Bit	EB	.56, .55, .55
			Bit	WB	.49, .51, .49
6	77051	0.5 W. of turn in Algonac, M. P. 12.6 - 12.8	Bit	NB	.27, .29, .32
			Bit	SB	.32, .34, .30
		At Algonac State Park, M. P. 15.5 - 15.7	1956 - Bit	NB	.41, .45, .44
			Bit	SB	.36, .39, .39
		S. of Avalon Beach Road, M. P. 18.3 - 18.5	1924 - Conc	NB	.39, .38, .42
			Conc	SB	.37, .36, .39
		0.8 mi. N. of Avalon Beach Rd., M. P. 19.4 - 19.6	1956 - Bit	NB	.39, .36, .36
			Bit	SB	.40, .37, .38
	77052	0.5 mi. N. of N. limits of Marine City, M. P. 2.5 - 2.7	1954 - Bit	NB	.45, .44, .45
			Bit	SB	.45, .46, .44
7	19062	1.0 mi. E. of St. Johns, M. P. 1.5 - 1.8	1958 - Bit	EB	.59, .58, .58
			Bit	WB	.64, .64, .62
		E. of Shepardville Road, M. P. 6.4 - 6.7	1958 - Bit	EB	.64, .59, .61
			Bit	WB	.65, .65, .63
		W. of Ovid, M. P. 8.2 - 8.5	1958 - Bit	EB	.56, .53, .55
			Bit	WB	.54, .58, .54
8	30041	W. of Chase Road, M. P. 6.6 - 6.9	1950 - Bit	EB	.45, .48, .44
			Bit	WB	.44, .44, .45
		W. of Rumsey Road, M. P. 8.7 - 9.0 (new patch)	Bit	EB	.60, .56, .62
			Bit	WB	.58, .56, .61

Site No.	Control Section	Test Location - POB to POE Description and Milepost	Year Constructed and Surface Type	Test Direction and/or Lane	40 mph Coeff. of wsf
8 (cont.)		W. of Jerome Road, M. P.	Bit	EB	.64, .62, .64
		10.7 - 11.0 (new patch)	Bit	WB	.60, .64, .59
		W. of Waldron Road, M.P.	1959 - NSST	EB	.56, .55, .53
		12.6 - 12.9	NSST	WB	.52, .53, .51
		W. of US-127, M. P.	1959 - Bit	EB	.40, .41, .40
		15.5 - 15.8	Bit	WB	.35, .39, .39
10	33082	E. of Marsh Road, M. P.	1957 - Bit	EB	.58, .59, .57
		4.6 - 4.9	Bit	WB	.57, .59, .57
		E. of VanAtta Road, M.P.	1957 - Bit	EB	.58, .56, .56
		6.8 - 7.1	Bit	WB	.58, .61, .58
		W. of Zimmer Road, M.P.	1957 - Bit	EB	.63, .62, .62
		10.0 - 10.3	Bit	WB	.61, .60, .61
12	38103	E. of Race Road, M. P. 4.0	1960 - Bit	WBOL	.32
		M. P. 5.0	Bit	"	.38
		M. P. 6.4	Bit	"	.33
		M. P. 7.3	Bit	"	.35
		M. P. 8.4	Bit	"	.31
		M. P. 9.7	Bit	"	.33
		M. P. 9.8	Bit	"	.34
		M. P. 4.8	1960 - Bit	WBIL	.48
		M. P. 6.2	Bit	"	.48
		M. P. 7.1	Bit	"	.48
		M. P. 8.2	Bit	"	.47
		M. P. 9.3	Bit	"	.50
	81104	W. Washtenaw County Line E.			
		M. P. 1.2	1961 - Bit	WBOL	.45
		M. P. 1.9	Bit	"	.46
		M. P. 1.0	Bit	WBIL	.59
		M. P. 1.9	Bit	"	.58
13	44011	S. of Braur Rd., N. to S. of	1968 - Bit	NB	.51, .52, .52, .56, .54
		Turrill Rd., M.P. 0.8 - 9.4	Bit	SB	.55, .57, .54, .55, .57
14	46062	E. of RR X-ing, M. P.	1952 - Bit	EB	.33, .35, .32
		13.7 - 14.0	Bit	WB	.37, .39, .36
		E. of Riga Hwy., M. P.	1940 - Conc	EB	.34, .34, .31
		15.1 - 15.4	Conc	WB	.37, .36, .34
		E. of Rodesiler Hwy., M. P.	Bit	EB	.41, .42, .42
		17.4 - 17.7		WB	.41, .42, .40
		E. of Horton Raod, M. P.	1940 - Conc	EB	.32, .36, .34
		17.9 - 18.2	Conc	WB	.34, .33, .34

Site No.	Control Section	Test Location - POB to POE Description and Milepost	Year Constructed and Surface Type	Test Direction and/or Lane	40 mph Coeff. of wsf
15	50012	S. of GTW RR, M. P.	1959 - Bit	NB	.46, .45, .42
		0.7 - 1.0	Bit	SB	.46, .45, .41
		N. of 33 Mile Road, M. P.	1958 - Bit	NB	.35, .40, .39
		5.8 - 6.0	Bit	SB	.37, .38, .39
		N. of Kidder Road, M. P.	1948 - Conc	NB	.34, .33, .31
		9.2 - 9.4	Conc	SB	.31, .33, .34
		S. of Macomb-Lapeer County	1948 - Conc	NB	.30, .35, .33
		Line, M. P. 10.9 - 11.2	Conc	SB	.30, .32, .32
16	50022	E. of Hayes Road, M. P.	1952 - Conc	EB	.28, .32, .29
		3.2 - 3.5	Conc	WB	.30, .31, .32
		E. of Romeo Plank Road,	1940 - Conc	EB	.29, .27, .31
		M. P. 5.2 - 5.5	Conc	WB	.30, .26, .28
19	63053	N. of Waterford Road, M. P.	1956 - Bit	NBOL	.48, .46, .45
		0.4 - 0.7	Bit	NBIL	.47, .49, .46
			Bit	SBOL	.42, .44, .43
			Bit	SBIL	.48, .44, .49
		N. of Walton Blvd., M. P.	1961 - Bit	SBOL	.46, .48, .45
		2.5 - 2.8	Bit	SBIL	.42, .42, .38
		N. of Hatchery Rd., M.P. 4.0	1956 - Bit	NBIL	.43, .38, .41
		S. of Hatchery Rd., M.P. 4.3	1961 - Bit	NBOL	.47, .44, .46
		M. P. 4.5 - 4.8	1961 - Bit	SBOL	.47, .44, .43
			Bit	SBIL	.45, .50, .48
		N. of Telegraph Rd., M. P.	1961 - Bit	NBOL	.46, .44, .41
		5.9 - 6.0	Bit	NBIL	.42, .39, .36
20	63091	N. of Widetrack Drive,	1958 - Bit	NBOL	.39, .42, .39
		M. P. 0.1	Bit	NBIL	.42, .41, .41
		N. of Oakhill, M. P.	1973 - Bit	SBOL	.44, .41, .43
		0.3	Bit	SBIL	.40, .40, .39
		N. of Hammond Street,	1958 - Bit	NBOL	.44, .43, .44
		M. P. 0.9	Bit	NBIL	.41, .41, .39
		Oliver Street to Joslyn Street	1958 - Bit	SBOL	.46, .46, .44
		M. P. 1.1	Bit	SBIL	.41, .43, .40
		N. of RR Overpass, M. P.	1958 - Bit	NBOL	.44, .44, .41
		2.5	Bit	NBIL	.46, .46, .46
			1958 - Conc	SBOL	.34, .33, .36
			Conc	SBIL	.35, .34, .34
21	70041	E. of Linden Avenue, M. P.	1953 - Bit	EB	.50, .47, .48
		16.0 - 16.3	Bit	WB	.50, .47, .50
		W. of 12th Street, M. P.	1956 - Bit	EBOL	.51, .49, .52
		18.3 - 18.6	Bit	EBIL	.54, .56, .53
			Bit	WBOL	.55, .50, .52
			Bit	WBIL	.51, .51, .53

21 (cont.)	70041	W. of M-11, M. P. 19.7 - 20.0	1956 - Bit	EBOL	.50, .49, .48
			Bit	EBIL	.49, .46, .49
			Bit	WBOL	.38, .36, .38
			Bit	WBIL	.44, .43, .45
22	72013	Snowbowl Road, N. to M-55 M. P. 7.6 - 12.2	1961 - Bit	NBOL	.39, .40, .42
			Bit	NBIL	.60, .59, .59
			Bit	SBOL	.41, .40, .41
			Bit	SBIL	.58, .57, .56
23	76062	W. of M-13, M. P. 11.7 - 12.0	1950 - Bit	EB	.46, .48, .47
			Bit	WB	.48, .48, .47
		E. of Reed Road, M. P. 8.6-8.9		EB	.52, .50, .48
				WB	.51, .54, .51
24	81011	N. of P.C.RR to Territorial Rd., M. P. 2.1 - 7.2	1967 - NSST	NB	.55, .57, .57, .58
			NSST	SB	.58, .58, .56, .58
26*	82151	S. of McNichols Road, M. P. 2.5 - 2.8	1953 - Bit	NBOL	.40, .40, .41
			Bit	NBIL	.41, .41, .40
			Bit	SBOL	.42, .43, .41
			Bit	SBIL	.43, .43, .45
		S. of Eight Mile Road, M. P. 4.6 - 4.9	1958 - Bit	NBOL	.37, .33, .35
			Bit	NBIL	.50, .49, .52
			Bit	SBOL	.38, .38, .36
			Bit	SBIL	.47, .48, .50
27	82141	W. of Poinciana St. to McArthur St., M. P. 0.3 - 0.8	1958 - Bit	EBOL	.42, .45, .41
			Bit	EBCL	.42, .46, .43
			Bit	EBIL	.44, .44, .45
			Bit	WBOL	.44, .43, .41
			Bit	WBCL	.46, .41, .42
			Bit	WBIL	.44, .46, .42

(*) Matching Control Highway deleted due to reconstruction.

Proposed Control Highway Sites
Skid Test Summary
(Sites numbered to correspond with Test Highways)

Site No.	Control Section	Test Location - POB to POE Description and Milepost	Year Constructed and Surface Type	Test Direction and/or Lane	40 mph Coeff. of wsf
2	46062	E. of E. exit Adrian Mall,	1960 - Bit	EB	.34, .35, .36
		M. P. 3.0 - 3.3		WB	.41, .40, .39
		E. of Ogden Road, M. P.		EB	.34, .36, .36
		5.5 - 5.8		WB	.40, .42, .40
3	54012	N. of Rose Street, M. P.	1958 - Bit	NB	.49, .48, .48
		2.2 - 2.5		SB	.45, .46, .45
		S. of 19 Mile Road, M.P.		NB	.54, .49, .48
		4.0 - 4.2		SB	.47, .50, .44
		S. of 19 Mile Road, M.P.		NB	.44, .40, .40
		4.3 - 4.5		SB	.44, .45, .48
4	13031	S. of "E" Drive, M. P.	1973 - Bit	NB	.54, .57, .56
		9.5 - 9.8		SB	.50, .50, .49
		S. of "B" Drive North,	1960 - Conc	NB	.33, .34, .37
		M. P. 13.3 - 13.6		SB	.32, .35, .35
6	77033	N. of Metcalf Road,	1967 - NSST	NB	.47, .49, .47
		M. P. 2.2 - 2.4		SB	.47, .49, .50
		N. of Milwaukee Street,	1934 - Conc	NB	.37, .35, .39
		M. P. 4.1 - 4.3		SB	.40, .38, .38
		S. of County Line, M. P.	1956 - Conc	NB	.39, .40, .38
		7.9 - 8.1		SB	.38, .38, .40
	74071	N. of Gardner Line Road,	1961 - Bit	NB	.40, .39, .41
		M. P. 3.3 - 3.5		SB	.43, .41, .40
		N. of Sheridan Line Road,	1961 - Bit	NB	.39, .42, .42
		M. P. 6.2 - 6.4		SB	.40, .41, .42
7	23092	S. of Bunker Road, M. P.	1955 - Bit	NB	.59, .59, .58
		2.8 - 3.1		SB	.50, .52, .53
		S. of Columbia Road, M.P.	1931 - Conc	NB	.33, .33, .32
		4.8 - 5.0		SB	.31, .29, .31
		N. of Vermontville Hwy.,	1955 - Bit	NB	.55, .56, .56
		M. P. 8.3 - 8.6		SB	.58, .61, .59
		S. of Waverly Road,	1931 - Conc	NB	.34, .33, .31
		M. P. 10.0 - 10.3		SB	.32, .32, .30
8	30062	E. of Brown Road, M. P.	1960 - Bit	EB	.44, .44, .46
		6.9 - 7.2		WB	.44, .44, .47
		E. of Denning Road, (patches)	1960 - Bit	EB	.55, .58, .56
		M. P. 8.0 - 8.3		WB	.56, .60, .57

Site No.	Control Section	Test Location - POB to POE Description and Milepost	Year Constructed and Surface Type	Test Direction and/or Lane	40 mph Coeff. of wsf
8 (cont.)		E. of Round Lake Road, M. P. 11.1 - 11.3	1960 - Bit	EB	.46, .42, .46
				WB	.42, .43, .37
		E. of Waldron Road, M. P. 14.0 - 14.3	1960 - Bit	EB	.36, .40, .37
				WB	.38, .40, .36
		W. of Somerset, M. P. 15.7 - 16.0	1958 - Bit	EB	.38, .39, .34
				WB	.35, .35, .34
10	29041	E. of Pine River, M. P. 0.5 - 0.8	1963 - Bit	EB	.51, .51, .50
				WB	.48, .48, .47
		W. of Pingree Road, M. P. 4.5 - 4.8	1963 - Bit	EB	.51, .52, .53
				WB	.55, .56, .55
		E. of Smith Road, M. P. 8.4 - 8.7	1973 - Bit	EB	.43, .43, .41
				WB	.44, .45, .46
12	38103	E. of Race Road, M. P. 4.2 - 4.5	1960 - Conc	EBOL	.44, .45, .43
				EBIL	.51, .50, .48
		E. of Mt. Hope Road, M. P. 6.2 - 6.5	1960 - Conc	EBOL	.43, .42, .41
				EBIL	.50, .49, .49
		W. of Clear Lake Road, M. P. 8.7 - 8.9	1960 - Conc	EBOL	.45, .44, .42
				EBIL	.51, .46, .50
	81104	E. of Notten Road, M. P. 0.5 - 0.8	1960 - Conc	EBOL	.46, .47, .47
				EBIL	.51, .50, .50
13	64012	N. of Buchanan Road, M. P. 1.6 - 1.9	1961 - Bit	NB	.40, .39, .42
				SB	.39, .42, .44
		N. of Fillmore Road, M. P. 3.5 - 3.7	1966 - Bit	NB	.51, .51, .50
				SB	.52, .54, .53
		S. of VanBuren Road, M. P. 8.4 - 8.6	1955 - Conc	NB	.36, .35, .34
				SB	.35, .33, .36
14	81031	N.E. of County Line, M. P. 0.1 - 0.3	1953 - Bit	EB	.50, .51, .51
				WB	.51, .51, .51
		N.E. of Arkona Road, M. P. 3.4 - 3.7	1967 - Bit	EB	.56, .55, .53
				WB	.54, .56, .53
15	58052	S. of Frederick, M.P. 9.7-9.9	1958 - Bit	NB	.35, .34, .35
		N. of Stewart, M.P. 10.7-10.9		SB	.43, .37, .38
		S. of LaSalle, M.P. 11.5-11.7		NB	.40, .42, .38
		N. of Heiss, M. P. 12.7-12.9		SB	.49, .45, .49
	58053	N. of Stoney Creek, M.P. 0.1 - 0.3	1970 - Bit	NBOL	.44, .42, .44
		N. of Grafton, M.P. 0.4-0.6		NBIL	.64, .66, .62
		S. of Buhl Rd., M.P. 0.8-1.0		SBIL	.67, .67, .68
		N. of Buhl Rd., M.P. 1.1-1.3		SBOL	.50, .51, .50

Site No.	Control Section	Test Location - POB to POE Description and Milepost	Year Constructed and Surface Type	Test Direction and/or Lane	40 mph Coeff. of wsf
15 (cont.)	58053	N. of Laro Rd., M.P. 3.3-3.8	1970 - Bit	NBOL	.50, .50, .49
				NBIL	.65, .64, .65
				SBOL	.51, .47, .47
				SBIL	.68, .66, .69
16	63131	S. of Square Lake Road, M. P. 3.0 - 3.3	1971 - Bit	NB	.42, .41, .44
				SB	.42, .42, .41
	63132	N. of Auburn Road, M.P. 0.2 - 0.4	1959 - Conc	NB	.30, .28, .30
				SB	.33, .32, .34
		S. of Avon Road, M. P. 1.6 - 1.8	1971 - Bit	NB	.51, .50, .51
				SB	.47, .46, .46
19	50031	S. of 15 Mile Road, M. P. 7.6 - 8.0	1959 - Conc	NBOL	.34, .34, .36
			1959 - Bit	NBIL	.47, .47, .43
			1959 - Conc	SBOL	.37, .34, .36
			1959 - Bit	SBIL	.47, .44, .42
		Remick Road, N. to Wendell Rd., M.P. 10.0 - 10.4	1959 - Conc	NBOL	.33, .33, .34
			1959 - Bit	NBIL	.50, .48, .48
			1959 - Conc	SBOL	.31, .35, .36
			1959 - Bit	SBIL	.46, .45, .43
		Elizabeth N. to M-59, M. P. 13.1 - 14.0	1959 - Conc	NBOL	.33, .33, .30
			1959 - Conc	NBIL	.38, .34, .36
			1959 - Bit	NBIL	.47, .48, .49
			1959 - Conc	SBOL	.38, .36, .37
			1959 - Bit	SBOL	.49, .50, .50
			1959 - Bit	SBIL	.53, .48, .51
20	63051	Cranbrook Rd., S. to Lone Pine Rd., M. P. 2.2 - 3.0	1972 - Bit	NBOL	.54, .54, .54
				NB#3	.58, .54, .58
				NB#2	.59, .57, .57
				NBIL	.58, .58, .55
			1969 - Bit	SBOL	.52, .50, .52
				SB#3	.53, .56, .55
				SB#2	.58, .56, .56
				SBIL	.55, .55, .55
		N. of Oak St., to Oakland M. P. 3.9 - 4.6	1961 - Bit	NBOL	.52, .50, .50
				NB#3	.52, .53, .55
				NB#2	.55, .56, .54
				NBIL	.54, .54, .54
			1969 - Bit	SBOL	.50, .50, .54
				SB#3	.53, .54, .50
				SB#2	.52, .52, .51
				SBIL	.56, .54, .54

Site No.	Control Section	Test Location - POB to POE Description and Milepost	Year Constructed and Surface Type	Test Direction and/or Lane	40 mph Coeff. of wsf
21	03072	N. of City of Allegan, M. P. 0.8 - 1.1	1970 - Bit	NB	.49, .45, .47
				SB	.45, .48, .48
		N. of Allegan Dam Road, M. P. 3.5 - 3.8	1970 - Bit	NB	.64, .62, .6
				SB	.58, .59, .57
		S. of M-89, M. P. 6.3 - 6.5	1970 - Bit	NB	.56, .60, .58
				SB	.58, .59, .5
22	72013	N. of County Road 402, M. P. 2.8 - 3.1	1961 - Bit	NBOL	.58, .59, .59
				NBIL	.66, .68, .6
		N. of Rest Area, M. P. 5.5- 5.8		NBOL	.49, .51, .48
				NBIL	.66, .66, .64
		S. of Snow Bowl Road, M.P. 6.8 - 6.5		SBOL	.49, .48, .5
				SBIL	.68, .64, .64
		N. of Median Crossover, M. P. 5.0 - 4.7		SBOL	.52, .52, .49
				SBIL	.66, .67, .6
23	76011	N. of Brewer Road, M.P. 9.2 - 9.5	1973 - Bit	NB	.60, .58, .58
				SB	.62, .65, .6
		S. of Bennington Road, M. P. 10.7 - 11.0		NB	.56, .61, .58
				SB	.58, .59, .57
		N. of Bennington Road, M. P. 11.3 - 11.6	1969 - Conc	NB	.40, .40, .3
				SB	.44, .46, .44
		N. of Delaney Road, M. P. 13.0 - 13.3	1969 - Conc	NB	.44, .49, .44
				SB	.46, .48, .4
		N. of Morrice Road, M. P. 14.6 - 14.9		NBOL	.28, .29, .29
				NBIL	.39, .40, .3
				SBOL	.33, .30, .2
				SBIL	.34, .33, .34
24	03023	E. of 27th St., M. P. 2.8 - 3.0	1960 - Bit	WB	.40, .38, .4
				EB	.40, .38, .37
		E. of 23rd St., M. P. 5.5 - 5.8		WB	.45, .49, .4
				EB	.50, .46, .4
		W. of Otsego, M. P. 8.8 - 9.1		WB	.51, .49, .48
				EB	.48, .45, .4
26	50031	Reconstruction in progress and unable to skid test.			
27	63031	N. of 8 Mile Road, M. P. 0.2 - 1.0	1966 - Conc	NBOL	.32, .32, .3
				NB#3	.34, .36, .35
				NB#2	.39, .36, .4
				NBIL	.44, .42, .4
				SBOL	.42, .42, .43
				SB#3	.45, .42, .4
				SB#2	.44, .46, .4
				SBIL	.45, .44, .42

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

STATE HIGHWAYS BUILDING - POST OFFICE DRAWER K - LANSING, MICHIGAN 48904

JOHN P. WOODFORD, DIRECTOR

October 31, 1974

Mr. Douglas Harwood
Highway and Traffic Systems Engineering
Midwest Research Institute
425 Volker Boulevard
Kansas City, Missouri 64110

Dear Mr. Harwood:

Re: Skid Test Summary Additions
Your Contract No. DOT-FH-11-8120 Our Research Project 54 G-74, (73 TI-175) 74 SR-9A

Attached are tabulated skid test data for the two additional control highway test sites discussed in your recent telephone conversation with Philip T. Luce. This listing should complete "before" skid test measurements required for your study.

Very truly yours,

TESTING AND RESEARCH DIVISION

K. A. Allemeier
Engineer of Testing and Research

MICHIGAN
THE GREAT LAKE STATE

Proposed Control Highway Sites
Skid Test Summary (Supplement
to 5-22-74 Listing)

Site No.	Control Section	Test Location-POB to POE Description and Milepost	Year Constructed and Surface Type	Test Direction and/or Lane	40 mph Coeff. of wsf
16	77051	E. of Walpole St.	1954 Conc.	EB	.23,.23,.27
		M.P. 0.5-0.8		WB	.23,.28,.27
		M.P. 1.2-1.5		EB	.23,.22,.22
		In Anchorville		WB	.25,.27,.28
		M.P. 1.9-2.2			
		W. of Fairhaven		EB	.24,.26,.26
		M.P. 2.7-3.0		WB	.24,.25,.24
		In Fairhaven		EBOL	.26,.27,.30
		M.P. 3.5-3.8		EBIL	.24,.27,.32
				WBOL	.29,.28,.29
				WBIL	.24,.22,.23
		W. of Palms Rd.		EB	.22,.25,.24
		M.P. 5.1-5.4			
		W. of Perch Rd.		WB	.24,.32,.31
		M.P. 5.4-5.7			
26	82131	N. of Puritan	1956 Bit	NBOL	.33,.36,.34
		M.P. 2.4-2.6		NBIL	.31,.33,.33
				SBOL	.30,.28,.31
				SBIL	.28,.31,.28
		S. of Chicago	1969 Bit	NBOL	.32,.32,.29
		M.P. 4.7-4.9		NBIL	.34,.31,.34
				SBOL	.34,.34,.34
				SBIL	.33,.33,.34
		S. of Bethune	1968 Bit	NBOL	.23,.24,.28
		M.P. 5.8-6.1		NBCL	.33,.34,.32
				NBIL	.34,.34,.30
				SBOL	.34,.34,.32
				SBCL	.41,.37,.36
				SBIL	.37,.37,.36

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

April 26, 1974

To: M. N. Clyde
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests at Intersection of M 53 and M 46 in Sanilac County.
Research Project 54 G-74, 74 SR-10.

In accord with your February 26 request, skid tests have been conducted at the subject intersection. Three tests in each of the four stopping areas were measured April 23 and results are shown below for your review.

Route	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg.
M 46	Conc	EB	0.42	0.44	0.43
	Bit	WB	0.58	0.61	0.60
M 53	Bit	NB	0.65	0.66	0.65
	Bit	SB	0.62	0.64	0.63

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: D. Van Hine
M. R. Hoffman
K. A. Allemeier

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

April 26, 1974

To: M. N. Clyde
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests at Several Locations on M 50 in the City of Tecumseh, Lenawee County, Control Section 46082.
Research Project 54 G-74, 74 SR-11.

In accord with your March 19 request, "Before" and "After" skid tests will be conducted at the locations you specified. Testing before the scheduled M 50 resurfacing project was completed April 23. Follow up tests will be conducted and reported to you as soon as the resurfacing contract has been completed. Attached are results of the April 23 skid tests.

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:bf

cc: J. P. Neve, Jr.
K. A. Allemeier
M. R. Hoffman

Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg.
M 50 @ Occidental St	Conc	EB	0.34	0.35	0.35
	Conc	WB	0.32	0.37	0.35
M 50 from Cairns St to Sunset Rd	Conc	EB	0.33	0.34	0.34
	Conc	WB	0.33	0.36	0.34
M 50 @ Adrian St	Conc	EBOL	0.35	0.39	0.37
	Conc	EBIL	0.35	0.37	0.36
	Bit	WBOL	0.45	0.49	0.47
	Bit	WBIL	0.49	0.51	0.50
M 50 @ Union St	Bit	EBOL	0.44	0.47	0.46
	Bit	EBIL	0.40	0.42	0.41
	Bit	WBOL	0.44	0.47	0.46
	Bit	WBIL	0.44	0.48	0.46
M 50 @ Evans St	Bit	EBOL	0.37	0.39	0.38
	Bit	EBIL	0.36	0.37	0.37
	Bit	WBOL	0.37	0.38	0.37
	Bit	WBIL	0.36	0.38	0.37
M 50 @ Maumee St	Bit	EBOL	0.27	0.32	0.29
	Bit	EBIL	0.22	0.26	0.24
	Bit	WBOL	0.40	0.41	0.41
	Bit	WBIL	0.41	0.44	0.43

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

June 3, 1974

To: Max N. Clyde
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on I-94 in Berrien County
Research Project 54 G-74; 74 SR-12

In accord with your request dated April 29, 1974, skid tests have been completed on I-94 from 3400 ft west of Grand Mere Road to 500 ft east of Puetz Road (Stations 850 to 935). Tests at this location were conducted May 23, 1974. Friction levels ranged from 0.31 to 0.60 and averaged 0.46. A consistent increase in friction level is apparent across the lanes in an outside to inside direction. Skid test results and test locations are attached.

TESTING AND RESEARCH DIVISION

L. Roy T. Oehler
Engineer of Research

LTO:PMS:cgc
Attachment

cc: E. H. Miller
K. A. Allemeier

I-94 Skid Test Results
Research Project 54 G-74, 74 SR-12
Test Date: May 23, 1974

Station	EBOL	EBCL	EBIL	WBIL	WBCL	WBOL
850	0.34			0.60		
	0.35			0.57		
858	0.36			0.57		
865		0.48			0.44	
		0.47			0.49	
873		0.46			0.47	
880			0.57			0.31
			0.55			0.31
888			0.59			0.32
898	0.32			0.57		
	0.33			0.57		
906	0.34			0.56		
913		0.49			0.49	
		0.49			0.46	
921		0.49			0.46	
927			0.57			0.32
			0.58			0.34
935			0.57			0.33

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 20, 1974

To: Max N. Clyde
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on M-37 at the C&O RR Structure, Control Section 28011.
Research Project 54 G-74, 74 SR-13

In accord with your April 14, 1974 request, skid tests have been conducted on M-37 at the C&O RR structure in Grand Traverse County. The concrete deck of this structure yielded friction levels ranging from 0.27 to 0.29 and averaging 0.28. Tests were also conducted in the bituminous area, 500 ft north and south of subject structure. Resulting coefficients ranged from 0.42 to 0.45 and averaged 0.43. A tabulation of May 14, 1974 data is listed below for your review.

Description	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
500 ft S. of Structure	Bit	NB	0.42	0.43	0.42
	Bit	SB	0.44	0.44	0.44
On Structure	Conc	NB	0.27	0.29	0.28
	Conc	SB	0.27	0.28	0.28
500 ft N. of Structure	Bit	NB	0.42	0.43	0.42
	Bit	SB	0.43	0.45	0.44

TESTING AND RESEARCH DIVISION

L Roy T. Oehler
Engineer of Research

LTO:PMS:cgc

cc: K. A. Allemeier
B. A. Conradson

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 31, 1974

To: C. D. Church
Asst. to the Engineer of Testing & Research

From: L. T. Oehler

Subject: Follow-up Skid Tests on Project Mtb 18022-05548
Research Projects 73 C-15 and 54 G-74, 74 SR-14

In accord with your letter dated May 13, 1974, additional skid tests have been conducted on US-10 between Clare and M-115. May 28, 1974 tests at this site yielded wsf values ranging from 0.34 to 0.44. Friction level averages have increased since October 26, 1973 in all areas tested by 10 to 76 percent. Attached is a history of skid test values for your review.

TESTING AND RESEARCH DIVISION

L. Ray T. Oehler
Engineer of Research

LTO:PMS:cgc
Attachment

Skid Test Data
Project Mtb 18022-05548A

Test Area	Surface Compaction Method*	Direction	Coefficient of 40 mph WSF 8-24-73 Low	8-24-73 High	8-24-73 Avg.	10-26-73 Low	10-26-73 High	10-26-73 Avg.	5-28-74 Low	5-28-74 High	5-28-74 Avg.
West of Clare	(2)	EB	0.40	0.44	0.42	0.29	0.32	0.30	0.35	0.38	0.36
	(1)	WB	0.38	0.43	0.40	0.30	0.32	0.31	0.34	0.34	0.34
E. of Bradley Rd.	(2)	EB	0.36	0.40	0.39	0.26	0.30	0.28	0.36	0.41	0.39
	(1)	WB	0.39	0.41	0.40	0.31	0.33	0.32	0.40	0.41	0.40
Station 208+50 to 211+50 (Growth Curve Area)	(3)	EB	0.24	0.28	0.27	0.20	0.22	0.21	0.36	0.38	0.37
	(3)	WB	0.28	0.32	0.30	0.21	0.22	0.22	0.38	0.42	0.40
E. from old Pav't in Farwell	(2)	EB	Not tested			0.20	0.24	0.22	0.35	0.37	0.36
	(2)	WB	Not tested			0.21	0.22	0.22	0.38	0.39	0.38
W. of Farwell	(2)	EB	0.32	0.35	0.34	0.26	0.30	0.27	0.38	0.42	0.40
	(2)	WB	0.36	0.38	0.37	0.26	0.27	0.26	0.42	0.44	0.43

(*) 1. Static Roller Only.
2. 1 Pass Static, 1 Pass Vibratory, 2 Passes Static.
3. Growth Curve Area for Vibratory Roller.

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

November 21, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on BL 94 (Michigan) from BL 94 (Stadium) to Academy, City of Kalamazoo. Research Project 54 G-74, 74 SR-15.

In accord with your October 24, 1974 request, skid tests have been conducted at the subject location. Friction levels were measured November 7, 1974 and resulting values are shown on the attached drawing.

TESTING AND RESEARCH DIVISION

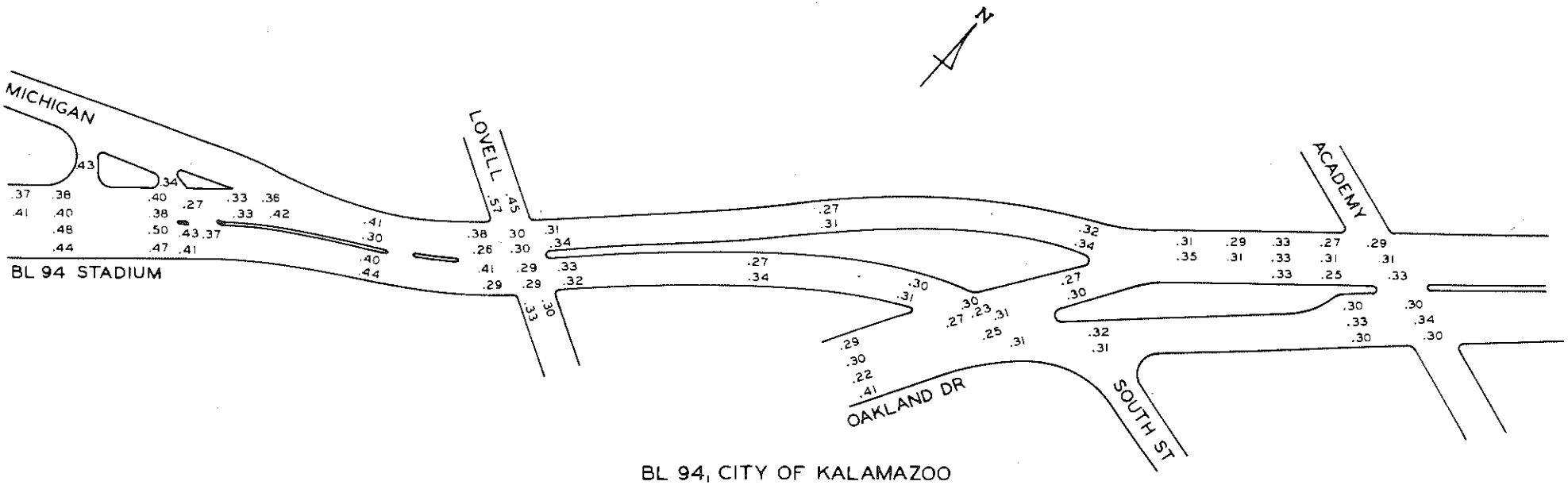
L. Kay T. Oehler

Engineer of Research

LTO:PMS:bf

Attachment

cc: K. A. Allemeier
E. H. Miller



BL 94, CITY OF KALAMAZOO
11-7-74 SKID TEST RESULTS

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

October 28, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on Three District 4 Resurfacing Projects.
Research Project 54 G-74, 74 SR-16.

In accord with a June 12, 1974 request from M. N. Clyde, skid tests have been conducted on three resurfacing projects located in District 4. Resulting wsf values are shown below.

Friction levels on M 65 from Hale Rd to the north junction of M 72 ranged from 0.25 to 0.56 and averaged 0.39. Because of the wide variation of coefficients encountered, the roadway was tested in the following eight areas.

Area	Lane	Coefficient of Wsf		
		Low	High	Avg
South from north junction of M 72	NB	0.42	0.46	0.44
	SB	0.36	0.38	0.37
North from Mitchell-Millen Township Line	NB	0.48	0.51	0.49
	SB	0.48	0.53	0.51
South from south junction of M 72	NB	0.52	0.56	0.54
	SB	0.44	0.47	0.46
North of Glennie City Limits	NB	0.35	0.38	0.36
	SB	0.32	0.38	0.35
North of Prentice Rd	NB	0.35	0.38	0.36
	SB	0.34	0.37	0.36
North of Carter Rd	NB	0.36	0.39	0.37
	SB	0.34	0.38	0.35
South of Bass Lake Rd	NB	0.33	0.35	0.34
	SB	0.26	0.29	0.28
North of North City Limits of Hale	NB	0.28	0.33	0.30
	SB	0.25	0.30	0.27

US 27 from Snow Bowl Rd north to M 55 is a test area for evaluation of Trinidad Asphalt. Test results are shown below.

Location Sta to Sta	Surface Type	Lane	Coefficient of Wsf Low	High	Avg
450 - 514	Trinidad Asphalt	NBOL	0.48	0.50	0.49
		NBIL	0.56	0.59	0.58
514 - 561+50	Trinidad Asphalt	NBOL	0.48	0.50	0.49
		NBIL	0.54	0.57	0.56
561+50 - 612	Trinidad Asphalt	NBOL	0.51	0.53	0.52
		NBIL	0.51	0.54	0.53
612 - 706	Conventional	NBOL	0.51	0.53	0.52
		NBIL	0.58	0.59	0.59
450 - 515	Conventional	SBOL	0.52	0.54	0.53
		SBIL	0.58	0.62	0.60
515 - 612	Conventional	SBOL	0.51	0.55	0.53
		SBIL	0.58	0.62	0.60
612 - 659	Trinidad Asphalt	SBOL	0.50	0.52	0.51
		SBIL	0.58	0.63	0.60
659 - 706	Trinidad Asphalt	SBOL	0.42	0.46	0.45
		SBIL	0.53	0.56	0.54

Skid tests on M 18 (formerly M 144) from Roscommon northerly to the Roscommon-Crawford County Line ranged from 0.40 to 0.54 and averaged 0.48. Data has been broken down into the following three sections.

Location	Lane	Coefficient of Wsf Low	High	Avg
North of Roscommon	NB	0.41	0.44	0.43
	SB	0.40	0.45	0.42
North of Garfield Rd	NB	0.49	0.51	0.50
	SB	0.50	0.53	0.52
South of Roscommon-Crawford Line	NB	0.53	0.54	0.53
	SB	0.45	0.46	0.46

TESTING AND RESEARCH DIVISION

L. Ray T. Oldy

Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
F. I. Eggan

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

July 23, 1974

To: M. N. Clyde
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on M-25 at Sanborn St., City of Port Huron
Research Project 54 G-74, 74 SR-17

In accord with your request dated June 18, 1974, skid tests have been conducted on M-25, 500-ft north and south of Sanborn Street in the City of Port Huron. Uniform coefficients were measured throughout the area. The tests, made on July 2, showed friction levels ranging from 0.43 to 0.48 and averaging 0.45.

TESTING AND RESEARCH DIVISION

Engineer of Research

LTO:PMS:cgc

cc: P. J. Riley
R. E. Maki

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 5, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on M 125 Between 8th St and a Point North of M 50, City of Monroe. Research Project 54 G-74, 74 SR-18.

In accord with a letter from Max Clyde, dated June 28, 1974, skid tests have been conducted at the subject location. The SBOL between 3rd St and 8th St has a concrete surface in one wheel path and bituminous in the other; the remainder of the lanes tested were bituminous.

Friction levels were measured on August 1 and ranged from 0.26 to 0.46, averaging 0.34.

Test results have been broken into 3 areas and are shown below. Milepost descriptions within Control Section 58071 are also provided.

M 125 Locations	Lane	Coefficient of Wsf		
		Low	High	Avg
From North Jct. to South Jct. of M 50 (14.765-14.908)	NBOL	0.27	0.31	0.29
	NBIL	0.28	0.31	0.30
	SBOL	0.26	0.30	0.27
	SBIL	0.30	0.33	0.32
Between 3rd St and 6th St (14.600-14.370)	NBOL	0.31	0.33	0.32
	NBIL	0.43	0.46	0.44
	SBOL*	0.31	0.31	0.31
	SBIL	0.36	0.38	0.37
Between 6th St and 8th St (14.370-14.190)	NBOL	0.30	0.34	0.32
	NBIL	0.41	0.42	0.41
	SBOL*	0.39	0.39	0.39
	SBIL	0.37	0.40	0.39

*One wheel path concrete, the other bituminous.

TESTING AND RESEARCH DIVISION

L Ray T. Oehler
Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
J. P. Neve, Jr.

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 5, 1974

To: P. J. Serafin
Acting Engineer of Testing

From: L. T. Oehler

Subject: Skid Tests on Eastbound I 94 Shoulders East of Telegraph Rd.
Research Project 54 G-74, 74 SR-19.

In accord with your August 8, 1974 teletype request, skid tests have been conducted on the "wet bottom slag" bituminous shoulders east of Telegraph Rd. Friction levels determined August 13, 1974 ranged from 0.52 to 0.59 and averaged 0.56.

Additional skid tests have been scheduled for the spring of 1975; results will be forwarded at that time.

TESTING AND RESEARCH DIVISION

L. (by) T. Oehler
Engineer of Research

LTO:PMS:bf

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 5, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on US 31 Between Sherman Boulevard and Laketon Ave, City of Muskegon. Research Project 54 G-74, 74 SR-20.

In accord with a letter from L. J. Doyle, dated August 8, 1974, skid tests have been conducted at the subject location.

Twenty-four tests conducted on the concrete surface yielded wsf values ranging from 0.36 to 0.48 and averaging 0.42. Six tests were conducted on the bituminous surface and showed a marked difference in wsf values between the SBOL and SBIL; wsf values averaged 0.32 and 0.47, respectively.

An additional breakdown of the test data is shown below for your review.

US 31 Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
North from Sherman Ave	Conc	NBOL	0.36	0.40	0.38
		NBIL	0.42	0.46	0.44
		SBOL	0.38	0.41	0.40
		SBIL	0.42	0.44	0.43
South from Laketon Ave	Conc	NBOL	0.38	0.41	0.40
		NBIL	0.47	0.48	0.47
		SBOL	0.38	0.39	0.39
		SBIL	0.45	0.48	0.47
Between Sherman and Laketon Ave	Bit	SBOL	0.31	0.32	0.32
		SBIL	0.46	0.47	0.47

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
M. L. Jones

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 2, 1974

To: S. F. Cryderman, Deputy Director
Bureau of Transportation Planning

From: K. A. Allemeier

Subject: Pavement Skid Test Measurements: FHWA Braking Performance, Michigan Test Site. Research Project 54 G-74, 74 SR-21.

In response to your letter dated August 8, 1974, skid tests were conducted before, during and after testing at the FHWA braking performance test site. The site was located in the parking area behind the westbound weigh station on I 94 near Fowlerville. Testing was performed using the Department's G. M. type tester (ASTM E-274-70). Reported test values would have been somewhat greater (approximately +0.10) had the Michigan Tester been employed. Although our two instruments correlate well, readings do not coincide.

Following is a summary of mean impending (maximum before sliding) and sliding coefficients of friction (μ) for indicated test conditions and speeds.

Test Date	Air Temp °F	Dry $\bar{\mu}$ 20 mph		Wet $\bar{\mu}$ 20 mph		Wet $\bar{\mu}$ 40 mph	
		Imp.	Sliding	Imp.	Sliding	Imp.	Sliding
8-18-74	80	0.94	0.63	0.98	0.62	0.91	0.50
8-30-74	79	0.97	0.68	0.91	0.54	0.80	0.40
9-6-74	75	0.96	0.65	0.87	0.52	0.82	0.39
9-13-74	67	0.98	0.63	0.91	0.57	0.88	0.42
9-20-74	68	1.00	0.69	0.89	0.58	0.81	0.40

TESTING AND RESEARCH DIVISION

K. A. Allemeier
Engineer of Testing and Research

KAA:FC:bf

cc: L. T. Oehler

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 8, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Special Skid Test Request for Completed Skidproofing Projects.
Research Project 54 G-74, 74 SR-22.

In accord with a August 12, 1974 request from L. J. Doyle, skid testing has been completed at the 17 requested locations scattered throughout six districts. Seventy lanes were tested during August and September; coefficients ranged from 0.23 to 0.54. Attached is a summary of these tests.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

Attachment

cc: K. A. Allemeier
L. J. Doyle
B. A. Conradson
F. I. Eggan
M. L. Jones
E. H. Miller
J. P. Neve, Jr.
P. J. Riley
M. E. Witteveen

Distriet 3

Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
US 31 - M 72 from 700 ft W of Airport Access Rd E'ly 1,100 ft to Avenue "B", City of Traverse City	Bit	EBOL	0.35	0.38	0.37
		EBIL	0.38	0.41	0.39
		WBOL	0.37	0.38	0.37
		WBIL	0.34	0.36	0.35
US 31 - M 72 from 3 Mile Rd to 700 ft west of same, East Bay Twp., Grand Traverse County	Bit	EBOL	0.30	0.34	0.32
		EBIL	0.33	0.36	0.34
		WBOL	0.34	0.37	0.36
		WBIL	0.34	0.36	0.35
US 31 - M 72 from 1,500 ft W to 400 ft W of 4 Mile Rd, East Bay Twp, Traverse County	Conc	EBOL	0.31	0.33	0.32
		EBIL	0.34	0.37	0.35
		WBOL	0.34	0.36	0.35
		WBIL	0.33	0.36	0.35
District 4					
US 23 from 50 ft S of Park St to 100 ft N of Michigan, City of Oscoda	Bit	NB	0.39	0.41	0.40
		SB	0.28	0.33	0.30
District 5					
M 11 from 45 ft W of Highgate to 300 ft E of Buchanan, City of Wyoming	Bit	EBOL	0.37	0.39	0.38
		EBIL	0.41	0.44	0.42
		WBOL	0.35	0.35	0.35
		WBIL	0.43	0.47	0.45
350 ft of the US 131 southbound off-ramp at M 11, City of Wyoming	Conc	SB	0.31	0.33	0.32
		RTL	0.32	0.34	0.33
		LTL	0.32	0.35	0.33
NB US 31 BR ramp to WB M 120, City of Muskegon	Light Bit	NBOL	0.23	0.29	0.25
		NBIL	0.28	0.29	0.28
	Dark Bit	NBOL	0.36	0.39	0.38
		NBIL	0.39	0.41	0.40
EB M 120 ramp to NB US 31 Br, City of Muskegon	Light Bit	EBOL	0.24	0.28	0.26
		EBIL	0.30	0.32	0.31
	Dark Bit	EBOL	0.42	0.45	0.44
		EBIL	0.38	0.43	0.40

Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
BS 96 - US 31 BR (Muskegon and Webster Aves.) approaches to Marquette Ave, City of Muskegon	Bit	NBOL	0.34	0.39	0.36
		NB#3	0.37	0.39	0.38
		NB#2	0.37	0.40	0.39
		NBIL	0.42	0.45	0.43
		SBOL	0.37	0.43	0.40
		SB#3	0.40	0.46	0.43
		SB#2	0.42	0.47	0.45
		SBIL	0.46	0.49	0.48
BS 96 - US 31 BR (Muskegon and Webster Aves.) approaches to Spring St, City of Muskegon	Bit	NBOL	0.39	0.41	0.40
		NBCL	0.38	0.39	0.39
		NBIL	0.41	0.45	0.43
		SBOL	0.40	0.42	0.41
		SB#3	0.40	0.44	0.42
		SB#2	0.40	0.44	0.42
		SBIL	0.48	0.54	0.51
District 7					
BL 94 from 50 ft W of 10th St to 60 ft E of Colfax, City of Benton Harbor	Bit	EBOL	0.30	0.32	0.31
		EBIL	0.29	0.33	0.31
		WBOL	0.30	0.34	0.32
		WBIL	0.32	0.34	0.33
US 33 from 300 ft N to 300 ft S of Park St, City of St. Joseph	Bit	NBOL	0.33	0.34	0.33
		NBIL	0.34	0.35	0.34
		SBOL	0.34	0.37	0.35
		SBIL	0.35	0.36	0.37
Eastbound BL 94 (Michigan) from 400 ft W to 50 ft E of US 131 BR (Westnedge), City of Kalamazoo	Bit	EBOL	0.38	0.39	0.39
		EB#4	0.40	0.44	0.42
		EB#3	0.36	0.39	0.38
		EB#2	0.37	0.40	0.39
		EBIL	0.41	0.44	0.43
Westbound BL 94 from 100 ft E of Church St E'ly to 150 ft E of Pitcher St at RR tracks, City of Kalamazoo	Bit	WBOL	0.28	0.31	0.30
		WBCL	0.29	0.32	0.30
		WBIL	0.27	0.30	0.28

Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
BS 96 (Cedar St) from 300 ft N to 300 ft S of Elm St, City of Lansing	Bit	NBOL	0.34	0.35	0.34
		NBIL	0.39	0.41	0.40
		NBRT	0.40	0.42	0.41
		SBOL	0.32	0.36	0.34
		SBIL	0.39	0.40	0.40
Southbound US 27 (Cedar St) from 50 ft S of, to 630 ft N of Grand River, City of Lansing	Bit	SBOL	0.37	0.40	0.39
		SBCL	0.36	0.37	0.37
		SBIL	0.36	0.39	0.37
District M					
Northbound M 39 ramp to northwestbound US 10, City of Southfield	Conc	NB to WBOL	0.29	0.33	0.32
		NB to WBIL	0.37	0.38	0.38

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

October 31, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Additional Skid Tests on Northbound M 39 Ramp to Northwestbound US 10. Research Project 54 G-74, 74 SR-22A.

In accord with a verbal request to Paul Schafer from R. E. Maki, additional skid tests were conducted on the northbound M 39 ramp to northwestbound US 10, in Southfield. Friction levels from October 22, 1974 tests on the bituminous portion of subject ramp ranged from 0.33 to 0.37 and averaged 0.35.

TESTING AND RESEARCH DIVISION

L. Ray T. Oehler
Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
P. J. Riley
R. E. Maki

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 6, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on the US-31 Bascule Bridge over the Grand River in Grand Haven. Research Project 54 G-74, 74 SR-23

In accord with a request on August 27, 1974 from L. J. Doyle, skid tests have been conducted on the Bascule Bridge carrying US-31 over the Grand River at the north limits of Grand Haven. Friction levels measured on August 29, 1974 on the concrete portion of the deck ranged from 0.25 to 0.43 and averaged 0.33. Tests on the steel grating yielded coefficients ranging from 0.30 to 0.58 and an average of 0.44.

A schematic showing September 28, 1971 and August 29, 1974 skid test results is attached.

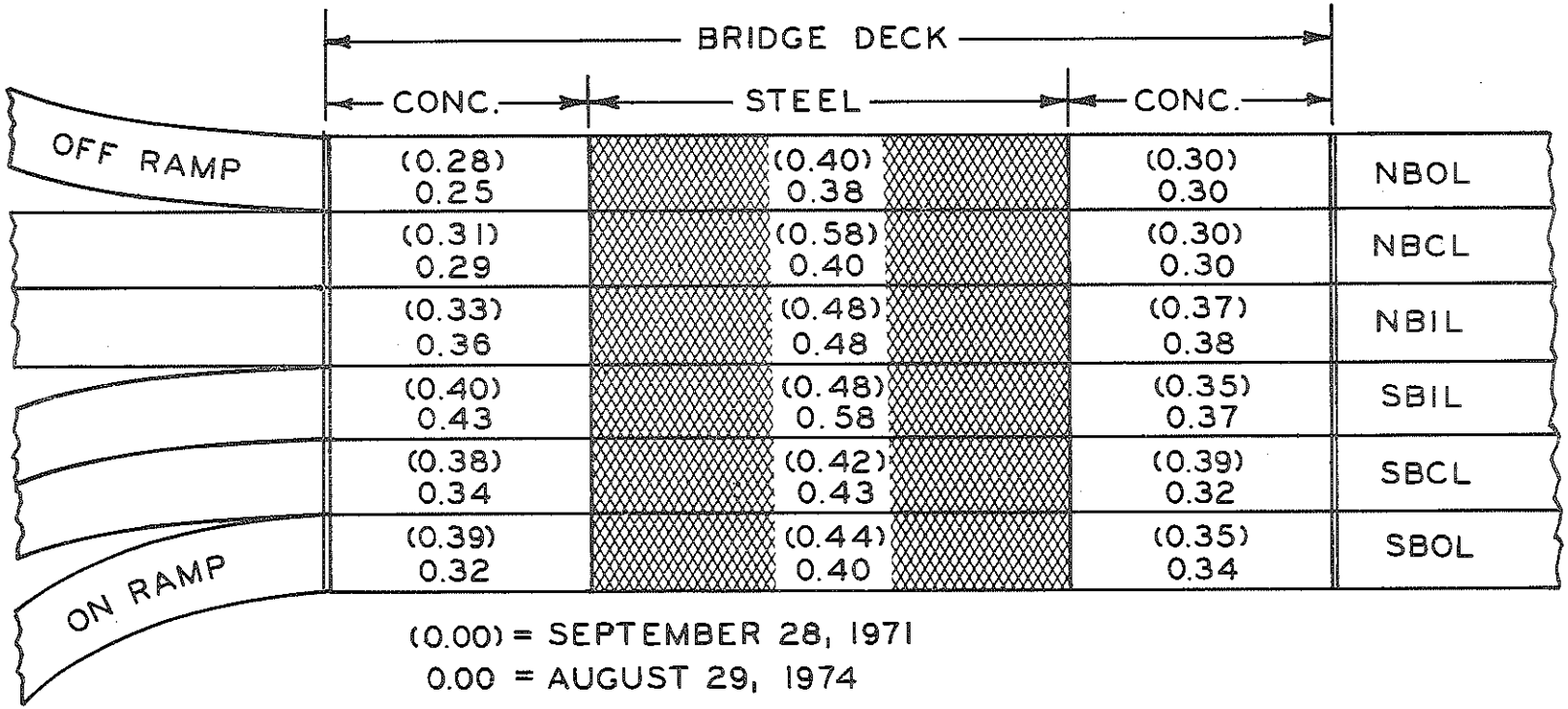
TESTING AND RESEARCH DIVISION

Le Roy T. Oehler
Engineer of Research

LTO:PMS:cgc
Attachment

cc: K. A. Allemeier
M. L. Jones

SKID TEST RESULTS
US 31 Over The Grand River In Grand Haven
(B02 of 70014)
74 SR-23



(0.00) = SEPTEMBER 28, 1971
0.00 = AUGUST 29, 1974

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

October 28, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Additional Skid Tests on US 10 Between Clare and M 115 in Clare County. Research Project 54 G-74, 74 SR-24.

In accord with your request dated September 24, 1974, skid tests have been conducted on US 10 between Clare and M 115. Friction levels ranged from 0.34 to 0.46 and averaged 0.41 during tests made on October 11. Of the five areas tested, only the portion "West of Clare" yielded coefficients averaging below 0.40. Results of all tests are summarized below for your review.

Location	Lane	Coefficient of Wsf		
		Low	High	Avg
West of Clare	EB	0.38	0.40	0.39
	WB	0.34	0.38	0.35
West of Bradley Rd	EB	0.40	0.42	0.41
	WB	0.41	0.43	0.42
East of Farwell	EB	0.42	0.46	0.44
	WB	0.40	0.44	0.43
West of Farwell	EB	0.40	0.44	0.42
	WB	0.40	0.43	0.42
East of M 115	EB	0.39	0.40	0.40
	WB	0.39	0.44	0.42

TESTING AND RESEARCH DIVISION

L Ray T Oehler
Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
B. A. Conradson

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

October 18, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on the NB I 94 Exit Ramp to M 29.
Research Project 54 G-74, 74 SR-25.

In accord with your September 25, 1974 request, a representative number of skid tests have been conducted on the northbound I 94 exit ramp to M 29 in Macomb County. The complete set of wsf values, listed in order from I 94 to the stop sign at M 29 are: 0.35, 0.36, 0.38, 0.36, 0.33, 0.36, and 0.31.

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
P. J. Riley

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

October 18, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on US 10 BR (Eastman) at US 10 BR (Buttles), City of Midland. Research Project 54 G-74, 74 SR-26.

In accord with your October 4, 1974 request, skid tests have been completed. The area tested was the curve area where US 10 BR transitions from Eastman St to Buttles St in Midland. Friction levels ranged from 0.35 to 0.40 and averaged 0.37. Listed below, in order of traffic direction, are the complete set of wsf values for your review.

SEBOL	SEBIL
0.36	0.36
0.35	0.36
0.39	0.40
0.39	0.37
0.40	0.36

TESTING AND RESEARCH DIVISION

L. Ray T. Oehler
Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
D. Van Hine

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

October 18, 1974

To: K. A. Allemeier
Engineer of Testing and Research

From: L. T. Oehler

Subject: Follow-Up Skid Tests on Bituminous Surface Using White Pine Slag.
Research Projects 54 G-74 and 72 NM-316, 74 SR-27.

Skid tests were conducted October 2, 1973 on Halfway Road, running south and east from a point approximately 7 miles west of Ontonagon and reported to you in my transmittal dated November 2, 1973. Surfacing of subject roadway employed White Pine Slag in the mix design. The initial wsf values (1973 test results) ranged from 0.47 to 0.58 and averaged 0.53. Follow-up tests were made on September 25, 1974, after a one-year service period. Wsf values resulting from these tests ranged from 0.61 to 0.71 and averaged 0.65. The outstanding 1974 friction levels are approximately 23 percent higher than those determined initially in 1973.

Visual inspection of this surface was made on October 2, 1974. At this time some evidence of rounding off of sharp aggregate edges was present. Subject roadway is not exposed to a high traffic volume, therefore several years of follow-up testing of this surface are planned. Skid tests have been scheduled for the fall of 1975.

TESTING AND RESEARCH DIVISION

L Ray T Oehler

Engineer of Research

LTO:PMS:bf

cc: D. F. Malott
M. E. Witteveen
P. J. Serafin

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 22, 1974

To: D. E. Orne
Engineer of Traffic & Safety

From: L. T. Oehler

Subject: Skid Tests on US-223BR - M-52 in the City of Adrian
Research Project 54 G-74, 74 SR-28

In accord with your request dated October 7, 1974, skid tests have been conducted on US-223BR - M-52 (Main Street) from US-223 to M-34 in the City of Adrian. Wsf values determined from 40 skid tests ranged from 0.27 to 0.43 and averaged 0.36. Friction levels and approximated milepost descriptions are shown below.

Milepost Description	Surface Type	Coefficient of Wsf			
		SBOL	SBIL	NBIL	NBOL
20.75	Bit	0.29	0.43	0.35	0.39
20.85	Bit	0.36	0.36	0.40	0.34
20.95	Bit	0.33	0.34	0.34	0.32
21.05	Conc	0.33	0.37	0.33	0.37
21.15	Conc	0.36	0.38	0.35	0.38
21.25	Conc	0.32	0.35	0.36	0.40
21.35	Conc	0.33	0.36	0.35	0.36
21.45	Conc	0.30	0.34	0.36	0.35
21.55	Conc	0.34	0.38	0.32	0.37
21.65	Conc	0.38	0.38	0.39	0.37

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:cgc

cc: K. A. Allemeier
J. P. Neve

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

October 28, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on US 23 from South of M 72 North to North of Spruce Rd in Alcona County. Research Project 54 G-74, 74 SR-29.

In accord with your October 22, 1974 request, skid tests have been conducted on the recently constructed Project Mbr 01051-06118A. Location of subject project is US 23 from 1,485 ft south of M 72, in Harrisville, northerly a distance of 15.452 miles to a point 0.475 mile north of Spruce Rd in Alcona County. Skid tests were conducted at approximately one mile intervals and resulting wsf values are shown below. Friction levels encountered on the October 24, 1974 testing ranged from 0.44 to 0.58 and averaged 0.52.

Location	Coefficient of Wsf NB	SB
North of Harrisville	0.48	0.47
0.5 mile south of Trask Lake Rd	0.45	0.44
	0.52	0.48
	0.50	0.48
	0.52	0.51
North of Beaton Rd	0.53	0.48
	0.54	0.48
	0.53	0.54
at Black River	0.52	0.52
	0.54	0.52
	0.54	0.53
South of Black River Rd	0.55	0.46
	0.56	0.58
South of Sayers Rd	0.58	0.56
	0.58	0.58
North of Spruce Rd	0.53	0.53

TESTING AND RESEARCH DIVISION

L. Ray T. Oehler
Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
F. I. Eggan

OFFICE MEMORANDUM

February 5, 1975

TO: D. E. Orne
Engineer of Traffic & Safety

FROM: L. T. Oehler

SUBJECT: Skid Tests at Eleven Transverse Pavement Grooving Locations
Research Project 54 G-74, 74 SR-30

In accord with your October 30, 1974 request, additional skid tests have been conducted on the transverse pavement grooving locations.

Prior to cutting the grooves, during April 1974, all areas were tested. 40 mph coefficients ranged from 0.22 to 0.42 and averaged 0.33.

Transverse grooves were cut at eleven trunkline locations using five different specifications which varied groove width and spacing. Initial skid tests on the grooved pavement were made between May 22 and July 26, 1974. 40 mph wsf values ranged from 0.20 to 0.47 and averaged 0.36. Another set of tests were taken between July 25 and September 1, 1974. 40 mph friction levels ranged from 0.21 to 0.38 and averaged 0.32. The most recent test series was conducted from November 17 to 19, 1974. The 40 mph coefficient range was 0.24 to 0.47, averaging 0.39.

Between July 25 and September 1, skid tests were conducted on a series of control areas, located adjacent to the grooved pavement. Resulting wsf values averaged 0.29. A second series was conducted in November and wsf values, this time, averaged 0.36.

No significant change in friction level has occurred in the grooved areas. Average friction levels were within 0.03 for "before" and "after grooving" tests. A 0.07 increase in average friction level occurred between the second and third series of skid tests on the grooved pavement, but a 0.07 increase also occurred between the two matching series of tests on the control areas. Historically, this increase is, in part, expected because of lower ambient temperatures recorded during the November tests. Concluding from this, it appears that, when using the ASTM E-249 Skid Test Tire, pavement grooves do not significantly increase skid resistance values. However, we have some evidence to indicate that skid resistance is improved for smooth treaded tires or if measured at higher speeds.

Per your request, attached is a complete history of skid tests for transverse pavement grooving, showing 20 mph, 20 mph converted to 40 mph, and 40 mph skid test values.

TESTING AND RESEARCH DIVISION

L. Kay F. Oakley

Engineer of Research

LTO:PMS:cgc
Attachment

cc: K. A. Allemeier
P. Michelin
M. Jones
D. VanHine
E. Miller
J. Neve
P. Riley

SKID TEST SUMMARY FOR TRANSVERSE PAVEMENT GROOVING

Control Section, Location and Type of Grooving	Lane	Date	20 mph Coefficient of Wsf (Tested at 20 mph)									40 mph Coefficient of Wsf (Tested at 20 mph)									40 mph Coefficient of Wsf (Tested at 40 mph)								
			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)		
			Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
11053	NBOL	4-26-74	0.30	0.32	0.31							0.22	0.24	0.23														
Northbound US 33 from Pleasant St to Ship St, City of St. Joseph		5-22-74				0.37	0.38	0.37							0.27	0.28	0.27											
		8-6-74				0.43	0.48	0.46	0.31	0.36	0.34				0.32	0.36	0.34	0.23	0.27	0.25								
		11-19-74				0.31	0.34	0.33	0.29	0.32	0.30				0.23	0.25	0.24	0.21	0.24	0.22								
Transverse 0.095-in. wide 3/16-in. deep 3/4-in. center to center spacing	NBIL	4-26-74	0.40	0.43	0.42							0.30	0.32	0.31														
		5-22-74				0.41	0.41	0.41							0.30	0.30	0.30											
		8-6-74				0.47	0.52	0.50	0.43	0.46	0.44				0.35	0.38	0.37	0.32	0.34	0.33								
		11-19-74				0.44	0.47	0.45	0.40	0.43	0.42				0.33	0.35	0.34	0.30	0.32	0.31								
23012 and 33041	NEBOL	4-25-74	0.45	0.46	0.46							0.33	0.34	0.34														
US 27 approaches to Waverly Rd, Eaton and Ingham Counties		6-24-74				0.42	0.44	0.43							0.31	0.33	0.32											
		7-25-74				0.40	0.42	0.41	0.38	0.39	0.39				0.30	0.31	0.30	0.28	0.29	0.29								
		11-19-74				0.45	0.49	0.48	0.45	0.45	0.45				0.33	0.36	0.35	0.33	0.33	0.33								
Transverse 0.095-in. wide 3/16-in. deep 1-1/2-in. center to center spacing	NEBIL	4-25-74	0.45	0.46	0.45							0.33	0.34	0.33														
		6-24-74				0.44	0.45	0.45							0.33	0.33	0.33											
		7-25-74				0.38	0.39	0.38	0.35	0.39	0.38				0.28	0.29	0.28	0.26	0.29	0.28								
		11-19-74				0.46	0.49	0.48	0.48	0.50	0.49				0.34	0.36	0.35	0.36	0.37	0.36								
	NEBLT	4-25-74	0.62	0.65	0.64							0.47	0.53	0.49														
		6-24-74				0.46	0.52	0.49							0.34	0.38	0.36											
	SWBOL	4-25-74	0.40	0.42	0.41							0.30	0.31	0.30														
		6-24-74				0.44	0.48	0.45							0.33	0.36	0.34											
		7-25-74				0.39	0.39	0.39	0.36	0.41	0.38				0.29	0.29	0.29	0.27	0.30	0.28								
		11-19-74				0.49	0.50	0.49	0.44	0.47	0.46				0.36	0.37	0.36	0.33	0.35	0.34								
	SWBIL	4-25-74	0.45	0.49	0.46							0.33	0.36	0.34														
		6-24-74				0.48	0.52	0.50							0.36	0.38	0.37											
		7-25-74				0.39	0.40	0.40	0.40	0.42	0.41				0.29	0.30	0.30	0.30	0.31	0.31								
		11-19-74				0.48	0.53	0.51	0.44	0.48	0.46							0.33	0.36	0.34								
56023	EBOL	4-3-74	0.49	0.54	0.52							0.30	0.40	0.38														
Eastbound M 20 @ Ashman St, City of Midland		6-17-74				0.48	0.50	0.49	0.47	0.49	0.48				0.41	0.43	0.42	0.40	0.42	0.41								
		8-23-74				0.41	0.45	0.44	0.41	0.43	0.42				0.30	0.33	0.32	0.30	0.32	0.31								
		11-18-74				0.46	0.48	0.47	0.49	0.54	0.52				0.34	0.36	0.35	0.36	0.40	0.38								
Transverse 0.095-in. wide 3/16-in. deep 1-in. center to center spacing	EBCL	4-3-74	0.45	0.49	0.47							0.33	0.36	0.35														
		6-17-74				0.48	0.49	0.48							0.41	0.42	0.41											
		8-23-74				0.46	0.48	0.47	0.46	0.48	0.47				0.34	0.36	0.35	0.34	0.36	0.35								
		11-18-74				0.47	0.53	0.51	0.53	0.56	0.55				0.35	0.39	0.37	0.39	0.41	0.40								
	EBIL	4-3-74	0.51	0.56	0.53							0.38	0.41	0.39														
		6-17-74				0.45	0.52	0.49							0.39	0.45	0.42											
		8-23-74				0.46	0.48	0.47	0.47	0.52	0.49				0.34	0.36	0.35	0.35	0.38	0.36								
		11-18-74				0.46	0.51	0.48	0.52	0.54	0.53				0.34	0.38	0.36	0.38	0.40	0.39								

SKID TEST SUMMARY FOR TRANSVERSE PAVEMENT GROOVING (Cont.)

Control Section, Location and Type of Grooving	Lane	Date	20 mph Coefficient of Wsf (Tested at 20 mph)									40 mph Coefficient of Wsf (Tested at 20 mph)									40 mph Coefficient of Wsf (Tested at 40 mph)								
			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)		
			Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
56023	EBOL	4-3-74	0.52	0.53	0.53							0.38	0.39	0.39															
Eastbound M 20 @ Rodd St, City of Midland		6-17-74				0.47	0.52	0.50							0.40	0.45	0.43												
		8-23-74				0.39	0.42	0.41	0.42	0.46	0.44				0.29	0.31	0.30	0.31	0.34	0.32									
Transverse 0.095-in. wide 3/16-in. deep 1-in. center to center spacing		11-18-74				0.51	0.56	0.54	0.43	0.45	0.44				0.38	0.41	0.40	0.32	0.33	0.33									
	EBCL	4-3-74	0.48	0.53	0.50							0.36	0.39	0.37															
		6-17-74				0.51	0.53	0.52							0.44	0.46	0.45												
		8-23-74				0.47	0.48	0.48	0.43	0.45	0.44				0.35	0.36	0.36	0.32	0.33	0.33									
		11-18-74				0.52	0.53	0.52	0.50	0.52	0.51				0.38	0.39	0.38	0.37	0.38	0.37									
	EBIL	4-3-74	0.46	0.50	0.48							0.34	0.37	0.36															
		6-17-74				0.47	0.52	0.50							0.40	0.45	0.43												
		8-23-74				0.45	0.51	0.48	0.47	0.50	0.49				0.33	0.38	0.36	0.35	0.37	0.36									
		11-18-74				0.46	0.51	0.49	0.46	0.50	0.48				0.34	0.38	0.36	0.34	0.37	0.36									
56023	EBOL	4-3-74	0.51	0.54	0.52							0.38	0.40	0.39															
Eastbound M 20 @ Cronkwright, City of Midland		6-17-74				0.51	0.52	0.52							0.44	0.45	0.45												
		8-23-74				0.42	0.47	0.44	0.39	0.42	0.41				0.31	0.35	0.33	0.29	0.31	0.30									
Transverse 0.095-in. wide 3/16-in. deep 1-in. center to center spacing		11-18-74				0.48	0.54	0.51	0.49	0.52	0.51				0.36	0.40	0.38	0.36	0.38	0.37									
	EBCL	4-3-74	0.48	0.52	0.50							0.36	0.38	0.37															
		6-17-74				0.46	0.50	0.49							0.40	0.43	0.42												
		8-23-74				0.49	0.51	0.50	0.46	0.49	0.47				0.36	0.38	0.37	0.34	0.36	0.35									
		11-18-74				0.52	0.53	0.53	0.53	0.55	0.54				0.38	0.39	0.39	0.39	0.41	0.40									
	EBIL	4-3-74	0.45	0.47	0.46							0.33	0.35	0.34															
		6-17-74				0.51	0.55	0.53							0.44	0.47	0.45												
		8-23-74				0.49	0.54	0.52	0.48	0.48	0.48				0.36	0.40	0.38	0.36	0.36	0.36									
		11-18-74				0.52	0.57	0.54	0.47	0.49	0.48				0.38	0.42	0.40	0.35	0.36	0.36									
76021	EBOL	4-22-74	0.54	0.57	0.56							0.40	0.42	0.41															
Eastbound M 78 @ M 52		7-26-74				0.27	0.28	0.28	0.27	0.31	0.29				0.20	0.21	0.21	0.22	0.23	0.21									
		11-18-74				0.50	0.53	0.51	0.48	0.52	0.51				0.37	0.39	0.38	0.36	0.38	0.37									
Transverse 0.095-in. wide 3/16-in. deep 1-1/4-in. center to center spacing	EBIL	4-22-74	0.52	0.56	0.53							0.38	0.41	0.39															
		7-26-74				0.32	0.34	0.33	0.29	0.35	0.33				0.24	0.25	0.24	0.21	0.26	0.24									
		11-18-74				0.49	0.54	0.51	0.52	0.56	0.53				0.36	0.40	0.38	0.38	0.41	0.39									
81081	EBOL	4-16-74																			0.29	0.32	0.30						
M 17 @ Golfside, City of Ypsilanti		4-18-74	0.36	0.38	0.37							0.27	0.28	0.27															
		6-24-74				0.42	0.44	0.43							0.31	0.33	0.32							0.36	0.38	0.37				
		9-1-74																						0.25	0.30	0.27	0.23	0.25	0.24
Transverse 1/8-in. wide 3/16-in. deep 3/4-in. center to center spacing		11-17-74				0.47	0.49	0.48	0.44	0.47	0.45				0.35	0.36	0.35	0.33	0.35	0.34				0.37	0.38	0.38	0.32	0.33	0.32
	EBIL	4-16-74																			0.24	0.28	0.26						
		4-18-74	0.41	0.45	0.43							0.30	0.33	0.32															
		6-24-74				0.44	0.47	0.45							0.33	0.35	0.34							0.35	0.39	0.36				
		9-1-74																						0.30	0.30	0.30	0.23	0.29	0.27
		11-17-74				0.48	0.52	0.50	0.49	0.52	0.50				0.36	0.38	0.37	0.36	0.38	0.37				0.38	0.40	0.39	0.36	0.39	0.37
	WBOL	4-16-74																			0.25	0.28	0.26						
		4-18-74	0.41	0.44	0.43							0.30	0.33	0.32															
		6-24-74				0.46	0.48	0.47							0.34	0.36	0.35							0.37	0.40	0.39				
		9-1-74																						0.28	0.28	0.28	0.21	0.24	0.23
		11-17-74				0.50	0.54	0.51	0.46	0.49	0.48				0.37	0.40	0.38	0.34	0.36	0.35				0.41	0.42	0.42	0.32	0.35	0.34

SKID TEST SUMMARY FOR TRANSVERSE PAVEMENT GROOVING (Cont.)

Control Section, Location and Type of Grooving	Lane	Date	20 mph Coefficient of Wsf (Tested at 20 mph)									40 mph Coefficient of Wsf (Tested at 20 mph)									40 mph Coefficient of Wsf (Tested at 40 mph)								
			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)		
			Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
81081	EBOL	4-16-74																			0.31	0.34	0.33						
		4-18-74	0.41	0.46	0.43							0.30	0.34	0.32															
M 17 @ Oakwood, City of Ypsilanti		6-24-74				0.52	0.53	0.52							0.38	0.39	0.38							0.35	0.40	0.37			
		9-1-74																						0.31	0.35	0.34	0.26	0.28	0.27
Transverse		11-17-74																						0.45	0.49	0.47	0.31	0.36	0.34
1/8-in. wide		11-18-74				0.50	0.55	0.52	0.43	0.44	0.44				0.37	0.41	0.39	0.32	0.33	0.33									
3/16-in. deep	EBIL	4-16-74																			0.22	0.24	0.23						
3/4-in. center to center spacing		4-18-74	0.45	0.46	0.46							0.33	0.34	0.34															
		6-24-74				0.50	0.52	0.51							0.37	0.38	0.38							0.41	0.42	0.42			
		9-1-74																						0.31	0.36	0.34	0.29	0.33	0.31
		11-17-74																						0.46	0.46	0.46	0.42	0.48	0.46
		11-18-74				0.47	0.50	0.49	0.44	0.49	0.46				0.35	0.37	0.36	0.33	0.36	0.34									
	WBOL	4-16-74																			0.27	0.29	0.28						
		4-18-74	0.41	0.45	0.43							0.30	0.33	0.31															
		6-24-74				0.48	0.53	0.51							0.36	0.39	0.38							0.34	0.35	0.35			
		9-1-74																						0.33	0.35	0.34	0.29	0.32	0.30
		11-17-74																						0.42	0.46	0.44	0.36	0.37	0.36
		11-18-74				0.43	0.44	0.44	0.39	0.40	0.40				0.32	0.33	0.33	0.29	0.30	0.30									
	WBIL	4-16-74																			0.26	0.31	0.29						
		4-18-74	0.39	0.42	0.40							0.29	0.31	0.30															
		6-24-74				0.44	0.45	0.44							0.33	0.33	0.33							0.33	0.38	0.35			
		9-1-74																						0.32	0.36	0.33	0.27	0.32	0.30
		11-17-74																						0.39	0.40	0.40	0.33	0.38	0.35
		11-18-74				0.40	0.43	0.41	0.40	0.43	0.41				0.30	0.32	0.31	0.30	0.32	0.31									
81081	EBOL	4-16-74	0.42	0.46	0.44							0.33	0.36	0.35															
		6-24-74				0.46	0.50	0.48							0.34	0.37	0.36							0.37	0.43	0.40			
Eastbound M 17 @ Summit St, City of Ypsilanti		9-1-74				0.38	0.42	0.39	0.34	0.37	0.36				0.28	0.31	0.29	0.25	0.27	0.26									
		11-17-74				0.46	0.49	0.48	0.45	0.50	0.47				0.34	0.36	0.35	0.33	0.37	0.35									
	EBCL	4-16-74	0.42	0.44	0.43							0.33	0.34	0.34															
Transverse		6-24-74				0.48	0.50	0.49							0.36	0.37	0.37							0.41	0.43	0.42			
1/8-in. wide		9-1-74				0.31	0.34	0.33	0.30	0.31	0.30				0.23	0.25	0.24	0.22	0.23	0.22									
3/16-in. deep		11-17-74				0.43	0.48	0.46	0.39	0.45	0.43				0.32	0.36	0.35	0.29	0.33	0.32									
3/4-in. center to center spacing	EBIL	4-16-74	0.43	0.44	0.44							0.34	0.34	0.34															
		6-24-74				0.51	0.52	0.52							0.38	0.38	0.38							0.38	0.42	0.40			
		9-1-74				0.30	0.36	0.34	0.30	0.32	0.31				0.22	0.27	0.25	0.22	0.24	0.23									
		11-17-74				0.43	0.46	0.44	0.36	0.46	0.41				0.32	0.34	0.33	0.27	0.34	0.30									

SKID TEST SUMMARY FOR TRANSVERSE PAVEMENT GROOVING (Cont.)

Control Section, Location and Type of Grooving	Lane	Date	20 mph Coefficient of Wsf (Tested at 20 mph)									40 mph Coefficient of Wsf (Tested at 20 mph)									40 mph Coefficient of Wsf (Tested at 40 mph)								
			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)			Test Area (Before Grooving)			Test Area (Grooved)			Control Area (Not Grooved)		
			Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
	WBIL	4-16-74																			0.24	0.25	0.24						
		4-18-74	0.35	0.39	0.37							0.26	0.29	0.28															
		6-24-74				0.44	0.45	0.44							0.33	0.33	0.33							0.35	0.37	0.36			
		9-1-74																						0.29	0.36	0.32	0.25	0.27	0.26
		11-17-74				0.47	0.51	0.50	0.45	0.46	0.45				0.35	0.38	0.37	0.33	0.34	0.33				0.34	0.39	0.37	0.27	0.32	0.29
81081	EBOL	4-16-74																			0.32	0.35	0.33						
		4-18-74	0.39	0.41	0.40							0.29	0.30	0.30															
M 17 @ Hewitt St, City of Ypsilanti		6-24-74				0.43	0.45	0.44							0.32	0.33	0.33							0.35	0.37	0.36			
		9-1-74																						0.32	0.36	0.33	0.24	0.28	0.27
Transverse 1/8-in. wide 3/16-in. deep 3/4-in. center to center spacing		11-17-74				0.55	0.56	0.55	0.49	0.52	0.51				0.41	0.41	0.41	0.36	0.38	0.37				0.44	0.45	0.45	0.36	0.41	0.38
	EBIL	4-16-74																			0.24	0.26	0.25						
		4-18-74	0.39	0.41	0.40							0.29	0.30	0.30															
		6-24-74				0.40	0.45	0.43							0.30	0.33	0.32							0.37	0.38	0.37			
		9-1-74																						0.31	0.33	0.32	0.25	0.29	0.27
		11-17-74				0.50	0.52	0.51	0.47	0.52	0.49				0.37	0.38	0.38	0.35	0.38	0.36				0.39	0.42	0.41	0.34	0.38	0.36
	WBOL	4-16-74																			0.30	0.35	0.33						
		4-18-74	0.42	0.45	0.43							0.31	0.33	0.32															
		6-24-74				0.48	0.51	0.49							0.36	0.38	0.37							0.38	0.42	0.41			
		9-1-74																						0.34	0.37	0.36	0.29	0.31	0.30
		11-17-74				0.54	0.55	0.54	0.51	0.55	0.53				0.40	0.41	0.40	0.38	0.41	0.39				0.42	0.45	0.44	0.37	0.38	0.38
	WBIL	4-16-74																			0.26	0.30	0.27						
		4-18-74	0.43	0.45	0.44							0.32	0.33	0.32															
		6-24-74				0.45	0.50	0.48							0.33	0.37	0.35							0.38	0.41	0.40			
		9-1-74																						0.35	0.39	0.36	0.28	0.31	0.29
		11-17-74				0.55	0.58	0.57	0.51	0.56	0.54				0.41	0.43	0.42	0.38	0.41	0.40				0.41	0.44	0.43	0.35	0.39	0.38
81081	EBOL	4-16-74																			0.30	0.30	0.30						
		4-18-74	0.39	0.44	0.41							0.29	0.33	0.31															
M 17 @ Mansfield, City of Ypsilanti		6-24-74				0.44	0.46	0.45							0.33	0.34	0.33							0.31	0.34	0.32			
		9-1-74																						0.30	0.34	0.32	0.25	0.26	0.25
Transverse 1/8-in. wide 3/16-in. deep 3/4-in. center to center spacing		11-17-74				0.52	0.52	0.52	0.43	0.46	0.45				0.38	0.38	0.38	0.32	0.34	0.33				0.39	0.41	0.40	0.33	0.35	0.34
	EBIL	4-16-74																			0.23	0.26	0.24						
		4-18-74	0.39	0.43	0.41							0.29	0.32	0.30															
		6-24-74				0.45	0.46	0.45							0.33	0.34	0.33							0.35	0.39	0.37			
		9-1-74																						0.31	0.34	0.32	0.23	0.28	0.26
		11-17-74				0.53	0.56	0.55	0.51	0.53	0.52				0.39	0.41	0.40	0.38	0.39	0.38				0.37	0.41	0.40	0.35	0.39	0.37
	WBOL	4-16-74																			0.29	0.31	0.30						
		4-18-74	0.42	0.45	0.43							0.31	0.33	0.32															
		6-24-74				0.46	0.48	0.47							0.34	0.36	0.35							0.40	0.42	0.41			
		9-1-74																						0.32	0.35	0.34	0.29	0.33	0.31
		11-17-74				0.52	0.57	0.54	0.48	0.54	0.51				0.38	0.42	0.40	0.36	0.40	0.38				0.42	0.45	0.43	0.39	0.43	0.41
	WBIL	4-16-74																			0.26	0.28	0.27						
		4-18-74	0.42	0.45	0.43							0.31	0.33	0.32															
		6-24-74				0.44	0.48	0.46							0.33	0.36	0.35							0.38	0.40	0.39			
		9-1-74																						0.34	0.37	0.36	0.27	0.34	0.30
		11-17-74				0.53	0.57	0.55	0.52	0.56	0.54				0.39	0.42	0.41	0.38	0.41	0.39				0.43	0.46	0.45	0.39	0.46	0.42

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

November 21, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on Widetrack Drive, City of Pontiac.
Research Project 54 G-74, 74 SR-31.

In accord with your October 25, 1974 request, skid tests have been completed on Widetrack Drive in the city of Pontiac. Results of 111 skid tests, conducted November 12, 1974, are attached. Friction levels ranged from 0.30 to 0.46 and averaged 0.36.

TESTING AND RESEARCH DIVISION

for Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
P. J. Riley

Widetrack Drive Location	Lane	Coefficient of Wsf
Approach to Cottage St	OL	0.33
	#3	0.37
	#2	0.39
	IL	0.37
Between Cottage St and Whittemore St	OL	0.34
	#3	0.33
	#2	0.38
	IL	0.36
Approach to Whittemore St	OL	0.35
	#3	0.35
	#2	0.35
	IL	0.34
Approach to Judson St	OL	0.34
	#3	0.36
	#2	0.38
	IL	0.37
Approach to Auburn St	OL	0.36
	#3	0.34
	#2	0.38
	IL	0.36
Between Auburn St and Water St	OL	0.35
	#4	0.38
	#3	0.39
	#2	0.38
	IL	0.38
Approach to Water St	OL	0.33
	#4	0.38
	#3	0.36
	#2	0.37
	IL	0.36
Approach to Pike St	OL	0.34
	#4	0.37
	#3	0.36
	#2	0.41
	IL	0.36
Between Pike St and Huron St	OL	0.38
	#3	0.38
	#2	0.38
	IL	0.39

Widetrack Drive Location	Lane	Coefficient of Wsf
Approach to Huron St	OL	0.37
	#3	0.36
	#2	0.36
	IL	0.43
Approach to University St	OL	0.40
	#3	0.38
	#2	0.35
	IL	0.36
Between University St and Perry St	OL	0.34
	#4	0.38
	#3	0.38
	#2	0.40
	IL	0.44
Approach to Perry St	OL	0.36
	#5	0.36
	#4	0.38
	#3	0.35
	#2	0.38
	IL	0.41
Between Perry St and Saginaw St	OL	0.33
	#4	0.33
	#3	0.35
	#2	0.38
	IL	0.39
Approach to Saginaw St	OL	0.36
	#4	0.34
	#3	0.36
	#2	0.35
	IL	0.36
Approach to Oakland St	OL	0.32
	#4	0.36
	#3	0.36
	#2	0.36
	IL	0.39
Between Oakland St and Cass St	OL	0.34
	CL	0.30
	IL	0.36
Approach to Cass St	OL	0.37
	CL	0.36
	IL	0.36

Widetrack Drive Location	Lane	Coefficient of Wsf
Approach to Huron St	OL	0.31
	#3	0.36
	#2	0.33
	IL	0.34
Approach to Lawrence St	OL	0.33
	#3	0.39
	#2	0.36
	IL	0.40
Approach to Pike St	OL	0.38
	#3	0.39
	#2	0.37
	IL	0.40
Between Pike St and Auburn St	OL	0.33
	#3	0.34
	#2	0.40
	IL	0.38
Approach to Auburn St	OL	0.36
	#3	0.37
	#2	0.40
	IL	0.38
Approach to Judson St	OL	0.34
	CL	0.36
	IL	0.38
Approach to Jackson St	OL	0.35
	CL	0.36
	IL	0.40
Approach to Wesson St	OL	0.34
	CL	0.37
	IL	0.44
Following Wesson St	OL	0.37
	CL	0.37
	IL	0.46

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

November 20, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on M 13 and I 75 in Saginaw and Bay Counties.
Research Project 54 G-74, 74 SR-32.

In accord with your November 1, 1974 request, skid tests have been conducted along a seven mile section of M 13 from milepost 3.0 in control section 73091 north to milepost 2.7 in control section 09031. Friction levels resulting from 108 skid tests have been broken down into nine areas and are attached for your review.

Skid tests were also conducted, according to your request, on the Zilwaukee Bridge approaches (I 75). Resulting wsf values are listed below.

Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
Approaches to the Zilwaukee Bridge	Bit	NBOL	0.33	0.37	0.35
		NBIL	0.46	0.51	0.48
	Conc	SBOL	0.22	0.26	0.24
		SBIL	0.31	0.33	0.32

TESTING AND RESEARCH DIVISION

for Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
D. Van Hine

M 13 Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
North of Saginaw City Limits	Bit	NBOL	0.25	0.27	0.26
		NBIL	0.31	0.35	0.33
		SBOL	0.25	0.26	0.26
		SBIL	0.29	0.33	0.31
at I 75	Conc	NBOL	0.25	0.28	0.26
		NBIL	0.29	0.35	0.31
		SBOL	0.31	0.34	0.32
		SBIL	0.38	0.43	0.41
1 mile north of I 75	Bit	NBOL	0.41	0.42	0.42
		NBIL	0.41	0.45	0.44
		SBOL	0.42	0.45	0.43
		SBIL	0.48	0.52	0.50
North of County Line	Bit	NBOL	0.27	0.28	0.27
		NBIL	0.45	0.49	0.47
		SBOL	0.36	0.41	0.39
		SBIL	0.46	0.50	0.48
South of Cheboyganing Creek Bridge curve area	Bit	NBOL	0.29	0.31	0.30
		NBIL	0.40	0.42	0.41
	Conc	SBOL	0.41	0.42	0.42
		SBIL	0.51	0.53	0.52
on bridge	Bit	NBOL	0.40	0.44	0.43
		NBIL	0.46	0.48	0.47
		SBOL	0.40	0.46	0.43
		SBIL	0.48	0.48	0.48
North of Cheboyganing Creek Bridge curve area	Bit	NBOL	0.33	0.35	0.34
		NBIL	0.44	0.46	0.45
	Conc	SBOL	0.31	0.34	0.33
		SBIL	0.45	0.49	0.47
Approximately 1 mile north of bridge	Bit	NBOL	0.39	0.41	0.40
		NBIL	0.42	0.45	0.43
	Conc	SBOL	0.38	0.39	0.38
		SBIL	0.37	0.42	0.39
South of Bay City Limits	Bit	NBOL	0.36	0.43	0.40
		NBIL	0.48	0.48	0.48
		SBOL	0.28	0.31	0.30
		SBIL	0.44	0.46	0.45

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

November 21, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Skid Tests on I 94 Between Wagner Rd and Liberty St, City of Ann Arbor. Research Project 54 G-74, 74 SR-33.

In accord with your November 6, 1974 request, skid tests have been conducted on Project 81062-03562A. This project is located on I 94, commencing 510 ft west of Wagner Rd thence easterly and southerly to a point 130 ft south of Liberty St in Ann Arbor. The surface type is bituminous concrete and was placed during 1974. Friction levels determined November 18, 1974 ranged from 0.38 to 0.50 and averaged 0.44. Below, test data is broken down by lanes for your review.

Direction and Lane	Coefficient of Wsf		
	Low	High	Avg
EBOL	0.38	0.47	0.42
EBIL	0.47	0.50	0.49
WBOL	0.41	0.44	0.43
WBIL	0.40	0.48	0.44

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:bf

cc: K. A. Allemeier
J. P. Neve, Jr.

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

December 5, 1974

To: D. E. Orne
Engineer of Traffic & Safety

From: L. T. Oehler

Subject: Skid Tests on M-20 from Remus East 11 Miles in Mecosta and Isabella Counties. Research Project 54 G-74, 74 SR-34

In accord with your November 20, 1974 request, skid tests have been conducted on the 11 mile section of M-20, east of Remus. Forty-four tests were conducted on November 21 over this 1974 construction bituminous concrete surface. Wsf values ranged from 0.44 to 0.54 and averaged 0.50.

TESTING AND RESEARCH DIVISION

Engineer of Research

LTO:PMS:cgc

cc: K. A. Allemeier
L. J. Doyle
M. L. Jones

SECTION VII

SPECIAL ATTENTION LOCATIONS

Special Attention Locations

Commencing with the 1973 test program all locations with friction levels averaging 0.35 or lower will be reported as soon as such friction levels are determined. This will be accomplished through our previously established "high-accident" or "special request" programs, which have always been reported without delay, or through a recently established "special attention" reporting procedure. Reported within this section are the "special attention" locations and their respective Wsf values.

OFFICE MEMORANDUM

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

November 5, 1974

To: D. E. Orne
Engineer of Traffic and Safety

From: L. T. Oehler

Subject: Report of Pavements with 40 mph WSF Values Averaging Below 0.35.
Research Project 54 G-74, 74 SA-1.

In conformance with our policy to report friction levels of all pavements yielding average friction levels below 0.35, we are furnishing the attached list of 54 projects for your review. Friction levels below normal were discovered during routine skid tests on these projects during 1974. Skid values by themselves do not indicate the adequacy of pavement friction, but should be used together with other prevailing conditions for a complete evaluation.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

Attachment

cc: K. A. Allemeier

SPECIAL ATTENTION PROJECTS

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
05071-04834A	US 131 and M 66 from M 72 in Kalkaska NE'ly to M 66 in Mancelona	Bit	N of N Jct M 72			
			NB	0.34	0.35	0.34
			SB	0.31	0.35	0.33
			N of Phelps Rd			
			NB	0.42	0.44	0.43
			SB	0.41	0.42	0.42
			S of Co. Line			
			NB	0.45	0.49	0.47
			SB	0.46	0.48	0.47
11031-00100A	M 139 relocation from N end of Ox Creek Bridge N'ly to Main St	Conc	NBOL	0.40	0.44	0.42
			NBCL	0.40	0.42	0.41
			NBIL	0.41	0.44	0.43
			SBOL	0.28	0.31	0.29
			SBIL	0.31	0.36	0.33
		Bit	SBOL	0.33	0.36	0.35
			SBCL	0.41	0.43	0.42
			SBIL	0.48	0.50	0.49
11031-004	M 139 from I 94 N'ly to Ox Creek and the Penn Central RR	Conc	NBOL	0.22	0.24	0.23
			NBIL	0.20	0.22	0.21
			SBOL	0.20	0.24	0.22
			SBIL	0.26	0.28	0.27

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
11071-06128A (part)	M 140 from M 62 N'ly 7.46 mi to Napier Ave and from 1,050 ft N of S limits of Watervliet N'ly 0.49 mi to Paw Paw River	Bit	S of Napier Ave			
			NB	0.30	0.34	0.32
			SB	0.22	0.24	0.23
			N of Meadowbrook Rd			
			NB	0.38	0.40	0.39
			SB	0.28	0.33	0.31
11074-05042A (part)	M 51 from NCL of Niles NE'ly intermittently to 1,300 ft S of Berrien-Cass Co. Line	Bit	NB	0.33	0.34	0.33
			SB	0.35	0.39	0.37
12021-006	US 12 between Wright St and Avery Dr, City of Coldwater	Bit	EBOL	0.31	0.34	0.32
			EBIL	0.32	0.34	0.33
			WBOL	0.30	0.32	0.31
			WBIL	0.32	0.33	0.33
13032-04836A	M 66 from intersection of Capital Ave and Division St NE'ly and N'ly 5.71 mi omitting from Shell Dr N'ly 0.34 mi	Bit	N from Wabash St			
			NBOL	0.41	0.42	0.41
			NBIL	0.34	0.38	0.36
			SBOL	0.44	0.47	0.46
			SBIL	0.34	0.37	0.36
			S of Milton St			
			NB	0.32	0.35	0.34
			SB	0.30	0.33	0.32
13121 C1	I 94 BL from Columbia Ave NE to Dickman Rd	Conc	EB	0.36	0.38	0.37
			WB	0.33	0.35	0.34
13121 C2	I 94 BL (Dickman Rd) from 20th St in Springfield E'ly to Battle Creek City Limits	Conc	EBOL	0.30	0.31	0.30
			EBIL	0.30	0.32	0.31
		Bit	WBOL	0.45	0.46	0.46
			WBIL	0.45	0.48	0.47

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
13121 C3	I 94 BL (Dickman Rd) from W limits of Battle Creek E'ly to Upton Ave	Conc	EBOL	0.29	0.31	0.29
			EBIL	0.28	0.30	0.29
		Bit	WBOL	0.40	0.44	0.41
			WBIL	0.44	0.48	0.46
14011-06130	M 60 (State St) from M 62 (Broadway St) E'ly 1.12 miles to E Village Limits of Cassopolis	Bit	EB	0.34	0.37	0.36
			WB	0.32	0.36	0.34
14032-05920A	M 62 from M 60 (State St) in Village of Cassopolis N'ly and W'ly to the E City Limits of Dowagiac	Bit	S of Dowagiac			
			NB	0.34	0.36	0.35
			SB	0.26	0.30	0.28
			N of Kingsberry St			
			NB	0.37	0.42	0.40
			SB	0.45	0.51	0.48
20012 C2	I 75 BL from 0.732 mi S of M 72 N to S limits of Grayling	Bit	SBOL	0.28	0.32	0.30
			SBIL	0.43	0.46	0.44
23081-002	I 496 from I 96 E'ly to Waverly Rd	Conc	EBOL	0.29	0.34	0.31
			EBIL	0.37	0.40	0.39
			WBOL	0.30	0.33	0.32
			WBIL	0.33	0.36	0.34
24011-00307A	US 31 from Charlevoix-Emmet Co. Line E'ly to W City Limits of Petoskey	Bit	E of Charlevoix Co. Line			
			NB	0.31	0.33	0.32
			SB	0.37	0.41	0.39
			W of Petoskey Limits			
			NB	0.35	0.40	0.37
			SB	0.34	0.38	0.36

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
24011-00308A	US 31 from W City Limits of Petoskey E'ly to US 131	Bit	NBOL	0.36	0.40	0.38
			NBIL	0.31	0.34	0.32
			SBOL	0.33	0.34	0.34
			SBIL	0.30	0.34	0.32
24011-03949A	US 31 from Liberty St W'ly and S'ly to US 131 In Petoskey	Bit	NBOL	0.27	0.29	0.28
			NBIL	0.26	0.28	0.27
			SBOL	0.27	0.28	0.27
			SBIL	0.25	0.26	0.25
25052-008	M 54 BR (Saginaw St) from S City Limits of Mt. Morris N'ly to M 54 (Dort Hwy)	Bit	NBOL	0.31	0.36	0.33
			NBIL	0.36	0.38	0.37
			SBOL	0.32	0.34	0.33
			SBIL	0.36	0.38	0.37
98002-04730A 25081	M 56 (Corunna Rd) at Dye Rd	Bit	EBOL	0.30	0.35	0.33
			EBIL	0.40	0.45	0.43
			WBOL	0.36	0.40	0.38
			WBIL	0.41	0.45	0.43
25084-015	M 78 from 500 ft W of Howe Rd E'ly to Vassar Rd	Conc	W from Genessee Rd			
			EBOL	0.27	0.29	0.28
			EBCL	0.30	0.35	0.32
			EBIL	0.38	0.40	0.39
			WBOL	0.25	0.27	0.26
			WBCL	0.33	0.36	0.35
			WBIL	0.43	0.45	0.44

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
25084-015 (Cont.)			W of Irish Rd			
			EBOL	0.30	0.35	0.31
			EBCL	0.32	0.35	0.34
			EBIL	0.41	0.45	0.43
			WBOL	0.31	0.36	0.34
			WBCL	0.36	0.39	0.37
			WBIL	0.45	0.48	0.46
25084-016	M 78 (extended) from Vassar Rd E'ly to M 15	Conc	EBOL	0.31	0.34	0.32
			EBIL	0.34	0.38	0.36
			WBOL	0.34	0.37	0.35
			WBIL	0.35	0.37	0.36
25085-002	M 78 relocation from S of Ballenger Hwy E'ly to W of Fenton Rd	Conc	EBOL	0.24	0.28	0.27
			EBCL	0.29	0.32	0.30
			EBIL	0.32	0.36	0.34
			WBOL	0.28	0.32	0.31
			WBCL	0.30	0.32	0.31
			WBIL	0.32	0.35	0.33
25101-017	M 57 from E limits of Clio E'ly to M 54	Conc	EBOL	0.22	0.25	0.23
			EBIL	0.26	0.26	0.26
			WBOL	0.25	0.28	0.26
			WBIL	0.24	0.27	0.26
33033-06079A (part)	NB US 27 (Larch St) from 530 ft S of Kalamazoo St N'ly 1.39 mi to 470 ft N of Grand River Ave	Bit	NBOL	0.44	0.49	0.47
			NB#3	0.31	0.36	0.33
			NB#2	0.34	0.35	0.34
			NBIL	0.38	0.39	0.38
	SB US 27 (Cedar St) from 700 ft S of Kalamazoo St N'ly 1.31 mi to 200 ft S of Grand River Ave	Bit	SBOL	0.37	0.42	0.39
			SBCL	0.34	0.36	0.35
			SBIL	0.43	0.44	0.43

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
33061 C12	M 43 WB from Logan St E'ly to Capitol Ave	Conc	WBOL	0.21	0.24	0.22
			WBCL	0.30	0.31	0.30
			WBIL	0.27	0.28	0.27
33171-025	US 127 from the Red Cedar River N'ly to S of Woodruff Ave	Conc	NBOL	0.40	0.43	0.42
			NBIL	0.43	0.46	0.45
			SBOL	0.33	0.34	0.34
			SBIL	0.34	0.38	0.36
38083-017	I 94 BL US 127 BR and M 50 (Mich. Ave) from W of Lydia St NE'ly to W of Inters of Clinton St and Blackstone St	Conc	EBOL	0.32	0.33	0.32
			EBCL	0.34	0.36	0.35
			EBIL	0.32	0.34	0.33
			WBOL	0.33	0.37	0.35
			WBCL	0.33	0.34	0.33
			WBIL	0.36	0.38	0.36
41027 C58	I 196 from College Ave to Fuller Ave	Conc	EBOL	0.36	0.37	0.36
			EBIL	0.38	0.40	0.39
			WBOL	0.33	0.34	0.34
			WBIL	0.38	0.41	0.40
41027 C164	I 196 from Monroe Ave to Coit Ave	Conc	EBOL	0.33	0.33	0.33
			EBCL	0.35	0.38	0.37
			EBIL	0.43	0.44	0.43
			WBOL	0.35	0.36	0.35
			WBIL	0.36	0.38	0.37

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
41029 C6	I 196 from Sibley Ave to Lane Ave	Conc	EBOL	0.33	0.33	0.33
			EBIL	0.34	0.37	0.36
			WBOL	0.36	0.37	0.37
			WBCL	0.33	0.33	0.33
			WBIL	0.49	0.52	0.50
41029 C35	I 96 from Ottawa Co. Line NE'ly 1.779 mi	Conc	EBOL	0.36	0.36	0.36
			EBIL	0.38	0.41	0.39
			WBOL	0.31	0.34	0.32
			WBIL	0.34	0.38	0.36
41041-04028A	M 21 at I 196	Bit	EBOL	0.30	0.32	0.31
			EBIL	0.34	0.37	0.35
			WBOL	0.33	0.37	0.36
			WBIL	0.37	0.40	0.38
45041-003	M 204 from M 22 E'ly to Co. Rd No. 641	Bit	EB	0.34	0.36	0.35
			WB	0.35	0.40	0.37
46061-011	US 223 Br (W Maumee St and Church St) in Adrian at W Limits of Adrian	Stone-Filled Sand-Asphalt	EB	0.33	0.36	0.34
			WB	0.35	0.39	0.37
	US 223 BR and M 52 (Main St and Winter) from Nelson St to Merrick St		NBOL	0.31	0.33	0.32
			NBIL	0.39	0.41	0.40
			SBOL	0.33	0.37	0.35
			SBIL	0.41	0.43	0.42

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
57011-003	M 66 from Osceola-Missaukee Co. Line N'ly and W'ly to M 42 omitting from M 55 W to M 55 E	Bit	0.7 mi N of M 55 E			
			NB	0.32	0.34	0.33
			SB	0.36	0.39	0.37
			0.6 mi N of Co. Line			
			NB	0.54	0.56	0.55
			SB	0.53	0.55	0.54
			0.5 mi E of McBain			
			NB	0.51	0.53	0.52
			SB	0.46	0.48	0.47
			1.0 mi N of McBain			
			NB	0.51	0.53	0.52
			SB	0.49	0.51	0.50
59045-06782A	M 46 from C&O RR crossing near Lewis St E'ly to E Limits of Edmore (Neff Rd)	Bit	EB	0.24	0.28	0.26
			WB	0.24	0.28	0.26
61075 C5	US 31 relocation from Marcoux St N to N Limits of Muskegon	Bit	NBOL	0.33	0.35	0.34
			NBIL	0.42	0.44	0.43
			SBOL	0.35	0.36	0.36
			SBIL	0.44	0.45	0.45
62031 C10	M 37 and M 46 from S Limits of Newaygo N'ly to Wood St	Conc Bit	NBOL	0.30	0.32	0.31
			NBIL	0.48	0.51	0.50
		Conc Bit	SBOL	0.33	0.35	0.34
			SBIL	0.48	0.48	0.48

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
63041 C7	M 59 from Airport Rd to Elizabeth Lake Rd		E of Airport Rd			
		Conc	EBOL	0.33	0.36	0.34
		Bit	EBIL	0.49	0.53	0.51
		Conc	WBOL	0.35	0.37	0.37
		Bit	WBIL	0.53	0.57	0.55
			W from Crescent Lake Rd			
		Bit	EBOL	0.30	0.33	0.32
			EBIL	0.33	0.36	0.34
			WBOL	0.33	0.36	0.34
			WBIL	0.34	0.37	0.35
65032-00935A	M 55 and M 76 from I 75 E'ly to WCL of West Branch	Conc	EB	0.35	0.37	0.36
			WB	0.28	0.32	0.31
73051 C2	M 13 from S Limits of Saginaw N to Washington St	Bit	NB	0.28	0.33	0.30
			SB	0.31	0.32	0.31
73081-004	M 81 (Washington Ave) from 20th St E'ly to 25th St in Saginaw	Conc	EBOL	0.33	0.35	0.34
			EBIL	0.30	0.34	0.32
			WBOL	0.34	0.37	0.36
			WBIL	0.33	0.36	0.34
73091-005	M 81 from 10th St E'ly and NE'ly on relocation to 20th St	Conc	EBOL	0.33	0.38	0.36
			EBCL	0.36	0.40	0.38
			EBIL	0.33	0.35	0.34
			WBOL	0.33	0.35	0.34
			WBCL	0.34	0.36	0.34
			WBIL	0.36	0.39	0.37

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
73131-001	M 83 from 300 ft N of Townline Rd NW'ly to 488 ft N of NCL of Frankenmuth (omitting from 800 ft N of Cass River Bridge N to Genessee St)	Conc	S of 4 Lane S of Frankenmuth			
			NB	0.31	0.33	0.32
			SB	0.30	0.34	0.32
			4 Lane in Frankenmuth			
			NBOL	0.47	0.51	0.49
			NBIL	0.34	0.37	0.36
			SBOL	0.48	0.53	0.50
			SBIL	0.33	0.37	0.35
76011-010	M 52 from 359 ft S of Morrice Rd NE'ly to 330 ft N of Krouse Rd	Conc	NBOL	0.28	0.32	0.30
			NBIL	0.32	0.36	0.34
			SBOL	0.28	0.32	0.30
			SBIL	0.27	0.32	0.29
76012 C1	M 52 from N Limits of Owosso N to N of Wilkinson Rd	Conc	NBOL	0.38	0.39	0.38
			SBOL	0.33	0.36	0.34
Mm 9SC-9A 77071	M 154 from ferry landing S'ly to Bates Hwy on Harsens Island	Non-Skid Surface Treatment	Straightaway S of Ferry Docks			
			NB	0.26	0.29	0.27
			SB	0.29	0.33	0.31
			SW from Sans Souci			
			NB	0.43	0.48	0.45
			SB	0.42	0.45	0.44

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
76062-06143A (part)	M 21 from 75 ft E of Smith Rd E'ly 1.46 mi to 53 ft W of Chestnut St	Bit	EB	0.27	0.30	0.29
			WB	0.33	0.36	0.34
78011-04785A	M 103 from State Line to US 12	Bit	NB	0.33	0.36	0.34
			SB	0.34	0.40	0.38
	US 12 from M 103 E'ly to Mann Rd		EB	0.25	0.28	0.27
			WB	0.25	0.28	0.27
	US 131 from State Line N'ly to US 12		NB	0.28	0.32	0.30
			SB	0.29	0.33	0.31
81103 C7	M 14 from US 23 to Plymouth Rd	Conc	EBOL	0.35	0.35	0.35
			EBIL	0.38	0.41	0.40
			WBOL	0.32	0.33	0.32
			WBIL	0.34	0.37	0.35
82021-018	I 94 from 0.588 mi W of Wayne-Washtenaw Co. Line E'ly 7.859 mi	Bit	E from Co. Line			
			EBOL	0.31	0.35	0.33
			EBIL	0.38	0.41	0.40
			WBOL	0.34	0.40	0.37
			WBIL	0.36	0.44	0.41
			W from Haggerty			
			EBOL	0.32	0.34	0.33
			EBIL	0.38	0.41	0.40
			WBOL	0.31	0.34	0.32
			WBIL	0.42	0.44	0.43

SPECIAL ATTENTION PROJECTS (Cont.)

Project Number	Location Description	Surface Type	Direction and Lane	Coefficient of Wsf		
				Low	High	Avg
82061-03988A	US 12 (Michigan Ave) from Weithoff St in Inkster E'ly to W of Gulley Rd in Dearborn Heights	Bit	EBOL	0.34	0.37	0.36
			EBCL	0.33	0.36	0.34
			EBIL	0.36	0.39	0.38
			WBOL	0.31	0.36	0.33
			WBCL	0.31	0.36	0.34
			WBIL	0.37	0.42	0.40
82081-021	M 153 (Ford Rd) from 620 ft E of M 39 (Southfield Rd) E'ly to 600 ft W of Greenfield Rd	Conc	EBOL	0.31	0.35	0.33
			EB#3	0.36	0.38	0.37
			EB#2	0.34	0.36	0.35
			EBIL	0.33	0.35	0.34
		Bit	WBOL	0.49	0.50	0.49
			WB#3	0.46	0.48	0.47
			WB#2	0.50	0.51	0.50
			WBIL	0.54	0.56	0.55
82131-011	US 10 from 6 Mile Rd (McNichols) N'ly to approximately 100 ft SE of 8 Mile Rd	Bit	NBOL	0.35	0.40	0.37
			NB#4	0.34	0.38	0.36
			NB#3	0.38	0.42	0.40
			NB#2	0.37	0.43	0.41
			NBIL	0.36	0.38	0.37
			SBOL	0.46	0.47	0.46
			SB#4	0.40	0.43	0.42
			SB#3	0.33	0.36	0.35
			SB#2	0.32	0.37	0.34
			SBIL	0.32	0.34	0.33