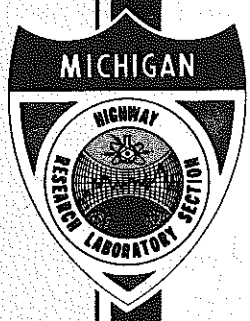
SUMMARIES OF MICHIGAN PAVEMENT SKID RESISTANCE 1973 Test Program



MICHIGAN DEPARTMENT OF STATE HIGHWAYS

MDSHT REPORT NO. 249
TESTING AND RESEARCH DIVISION

SUMMARIES OF MICHIGAN PAVEMENT SKID RESISTANCE 1973 Test Program

Research Laboratory Section
Testing and Research Division
Research Project 54 G-74
Research Report No. R-944

Michigan State Highway Commission
E. V. Erickson, Chairman; Charles H. Hewitt,
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John P. Woodford, Director
Lansing, October 1974

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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 1973 calendar year, over 12,500 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 1,616 lane miles of trunkline surfaces tested during 1973.

Table 1 - Concrete Pavements Constructed in 1972 and 1973

1972 Construction

Skid tests were conducted on 17 portland cement projects after a one-year service period. Friction levels ranged from 0.29 to 0.78 and averaged 0.55. Five of 82 lanes tested (2 percent of the 163.021 lane miles and 6 percent of the total lanes tested) yielded average Wsf values below 0.40.

1973 Construction

Three projects (32.560 lane miles) of concrete pavement were tested during the initial service year. All 13 lanes yielded average coefficients above the 0.40 mark. The range of Wsf values was 0.40 to 0.75, averaging 0.56.

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

1972 Construction

One-year friction levels were determined on 64 bituminous concrete (4.12) projects (239 lanes) during 1973. Coefficients ranging from 0.15 to 0.76 and averaging 0.49 were encountered.

Project Mb 82141-03966A (M 102 from Garfield St east to M 39) had a friction level range of 0.17 to 0.32 and an average of 0.26. The WBOL of this project ranged from 0.17 to 0.19 and averaged 0.18.

A 0.15 friction level coefficient was recorded on Project Mb 82211-01807A in the high accident location between milepost 8.71 and 8.91. Tests confined to this location ranged from 0.15 to 0.41 and averaged 0.32. This 0.2 mile section represents 7 percent of the Mb 82211-01807A project. Wsf values determined on the remainder of this project ranged from 0.39 to 0.49 and averaged 0.43.

Nineteen percent of the 634.106 lane miles (35 lanes) of bituminous concrete tested indicated a friction level below 0.40.

1973 Construction

Fifteen bituminous concrete projects (198.632 lane miles) were tested during their initial service year. Coefficients ranged from 0.21 to 0.68 and averaged 0.43. Twenty of the 70 lanes tested (36 percent of the lane mileage tested) yielded average friction values below 0.40. All lanes of Project U 82142-01310A averaged under the 0.40 mark.

Table 3 - Bituminous Aggregate (4.11) Constructed in 1972 and 1973

1972 Construction

After a one-year service period, 24 bituminous aggregate projects (69 lanes) with a total of 365.036 lane miles were tested. Wsf values ranged from 0.30 to 0.70 and averaged 0.53. Friction levels averaging below 0.40 were confined to Project Mb 30071-03802A and Ms 83012-04995A and represent only 6 percent of the total lane mileage tested.

1973 Construction

Nine bituminous aggregate projects, accounting for 172.222 lane miles were tested in 1973 during their initial year of service. Coefficients averaged 0.45. Six of the 26 lanes tested had average friction levels below 0.40.

Table 4 - Miscellaneous Bituminous Surfaces Constructed in 1972

Three single and double seal projects were tested in their initial service year. Friction levels on the 56.21 lane miles ranged from 0.31 to 0.70 and averaged 0.51. Only one of eight lanes tested had Wsf values averaging below 0.40.

TABLE 1
CONCRETE PAVEMENTS CONSTRUCTED IN 1972 AND 1973

	Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
				Coarse	Fine		Low	High	Avg
1972	U 08034-03127A	M 37 - M 43 from the W City Limits of Hastings E'ly to Broadway St in Hastings	Carl Goodwin and Sons, Inc.	8-80	8-80	EBOL	0.54	0.58	0.56
						EBIL	0.56	0.62	0.59
						WBOL	0.48	0.53	0.50
						WBIL	0.54	0.56	0.55
	F 08034-03128A	M 37 - M 43 from W of Heath Rd E'ly to W City Limits of Hastings	Carl Goodwin and Sons, Inc.	8-80	8-80	EB	0.44	0.49	0.47
						WB	0.43	0.46	0.45
	I 23061-020 (00293A)	I 69 from Eaton-Calhoun Co. Line N'ly and E'ly to E of Ainger Rd	Davco, Inc.	12-44 & 13-84	13-84	NBOL	0.47	0.53	0.50
						NBIL	0.61	0.62	0.61
						SBOL	0.46	0.48	0.47
						SBIL	0.59	0.62	0.61
	I 23061-021 (00294A)	I 69 from W of McDonald Rd NE to NE of Five Point Highway	Davco, Inc.	12-44	13-84	NBOL	0.39	0.43	0.41
						NBIL	0.63	0.64	0.63
						SBOL	0.39	0.43	0.41
						SBIL	0.59	0.60	0.60
	I 25132-03576A	I 475 from W of Clio Rd W'ly to I 75	C. J. Rogers	63-54	63-54	NBOL	0.62	0.64	0.63
						NBIL	0.61	0.65	0.63
						SBOL	0.64	0.67	0.65
						SBIL	0.71	0.74	0.72
	F 41133-00607A	US 131 from 600 ft N of 14 Mile Rd (M 57 E) N'ly to 2600 ft N of 17 Mile Rd (M 57 W)	Eisenhour Construction Co.	41-69	41-69	NBOL	0.68	0.73	0.71
						NBIL	0.74	0.78	0.76
						SBOL	0.64	0.66	0.65
						SBIL	0.63	0.67	0.65
	F 41133-00608A	US 131 from 2600 ft N of 17 Mile Rd (M 57 W) NE'ly to Grimes St	Eisenhour Construction Co.	41-69	41-69	NBOL	0.64	0.69	0.67
						NBIL	0.61	0.65	0.63
						SBOL	0.66	0.69	0.68
						SBIL	0.66	0.68	0.67
	F 50023-00665A	M 59 relocation from 3020 ft W of Oakland-Macomb Co. Line E'ly to Mound Rd	L. W. Edison	63-56 & E. C. Levy (Dix)	63-56	EBOL	0.47	0.66	0.57
						EBIL	0.48	0.66	0.56
						WBOL	0.55	0.66	0.62
						WBIL	0.44	0.67	0.60
	M 50051-03955A	SB US 25 (Gratiot Ave) from 400 ft S of Iroquis Ave NE'ly to Wellington Crescent	Sullivan Brothers Co.	E. C. Levy (Trenton)	50-41	SBOL	0.31	0.36	0.34
						SB#3	0.29	0.33	0.31
						SB#2	0.38	0.40	0.39
						SBIL	0.36	0.40	0.38

1972 CONT.

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

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
F 59012-03695A	US 131 relocation from 0.53 mi N of Cannonsville Rd N'ly to 0.58 mi N of M 46	Eisenhour Construction Co.	41-38	41-38	NBOL	0.67	0.71	0.69
					NBIL	0.70	0.75	0.72
					SBOL	0.65	0.68	0.66
					SBIL	0.63	0.65	0.64
F 63043-034 (00861A)	M 59 from Auburn Rd SE'ly and E'ly to W of Dequindre Rd (Oakland-Macomb Co. Line)	Cooke Contracting Co.	63-56 & E. C. Levy (Dix)	63-56	EBOL	0.45	0.60	0.55
					EBIL	0.37	0.61	0.55
					WBOL	0.52	0.61	0.57
					WBIL	0.54	0.62	0.58
I 65041-00944A	I 75 from Cook Rd NW'ly to S of M 55	Eisenhour Construction Co.	65-7	65-7	NBOL	0.56	0.62	0.59
					NBIL	0.60	0.62	0.61
					SBOL	0.62	0.66	0.64
					SBIL	0.64	0.67	0.66
I 65041-00945A	I 75 from N of M 30 NW'ly to N of M 55	Eisenhour Construction Co.	65-7	65-7	NBOL	0.57	0.62	0.60
					NBCL	0.58	0.60	0.59
					NBIL	0.55	0.57	0.56
					SBOL	0.49	0.51	0.50
					SBIL	0.56	0.58	0.57
U 82081-03030A	M 153 (Ford Rd) from Hawthorn St E to approximately 350 ft W of the Southfield interchange	Cooke Contracting Co.	E. C. Levy (Dix)	63-7 & 63-55	EBOL	0.42	0.43	0.42
					EB#3	0.45	0.49	0.46
					EB#2	0.43	0.48	0.45
					EBIL	0.45	0.50	0.48
					WBOL	0.37	0.39	0.38
					WBCL	0.44	0.47	0.45
					WBIL	0.52	0.56	0.54
BI 82123-043 (01263A)	I 96 (Jeffries Freeway) from Seebolt to Wreford Ave	K. G. Marks, Inc.	63-7	63-7	EBOL	0.40	0.45	0.43
					EB#3	0.51	0.53	0.52
					EB#2	0.51	0.54	0.53
					EBIL	0.57	0.60	0.59
					WBOL	0.48	0.53	0.51
					WB#3	0.44	0.47	0.45
					WB#2	0.57	0.61	0.58
					WBIL	0.61	0.64	0.63

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

	Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
				Coarse	Fine		Low	High	Avg
1972 CONT.	BI 82123-050 (01293A)	I 96 (Jeffries Freeway) from Grand River to Woodside in the City of Detroit	Cooke Contracting Co.	E. C. Levy (Dix)	63-55, 63-56 & 81-1	EBOL	0.51	0.53	0.52
						EB#3	0.46	0.50	0.48
						EB#2	0.45	0.48	0.46
						EBIL	0.51	0.56	0.53
						WBOL	0.41	0.43	0.42
						WB#3	0.51	0.55	0.53
						WB#2	0.56	0.60	0.58
						WBIL	0.53	0.55	0.54
	BI 82123-053 (01296A)	I 96 (Jeffries Freeway) from Woodside to Fernwood in the City of Detroit	Cooke Contracting Co.	E. C. Levy (Dix)	63-7 & 63-56	EBOL	0.46	0.49	0.47
						EB#3	0.44	0.47	0.45
						EB#2	0.42	0.44	0.43
						EBIL	0.50	0.53	0.51
						WBOL	0.47	0.50	0.49
						WB#3	0.47	0.50	0.48
						WB#2	0.52	0.55	0.53
						WBIL	0.56	0.62	0.58
1973	U 11031-00100A	M 139 relocation from N end of Ox Creek bridge N'ly to Main St	John Yerington Co.	E. C. Levy (Burns Harbor Indiana)	11-75	NBOL	0.58	0.62	0.60
						NBCL	0.55	0.59	0.57
						NBIL	0.70	0.75	0.72
						SBOL	0.40	0.43	0.41
						SBIL	0.55	0.59	0.57
	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.	54-22	54-22	NBOL	0.53	0.59	0.56
						NBIL	0.60	0.63	0.62
						SBOL	0.47	0.51	0.49
						SBIL	0.56	0.60	0.58
	F 59012-03696A	US 131 from N of M 46 interchange N to Edgar Rd	Eisenhour Construction Co.	41-38	41-38	NBOL	0.56	0.59	0.57
						NBIL	0.53	0.55	0.54
						SBOL	0.52	0.56	0.54
						SBIL	0.50	0.53	0.52

TABLE 2
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1972 AND 1973

1972

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 03023-04952A	M 89 from Michigan Ave SE'ly to Main St in Plainwell	Rieth-Riley Construction Co.	39-1	39-1	EBOL	0.62	0.62	0.62
					EBIL	0.57	0.59	0.58
					WBOL	0.54	0.59	0.56
					WBIL	0.55	0.58	0.57
Mtb 11012-03757A	I 94 BL from 600 ft NE of C & O RR NE'ly to 700 ft N of Murphy Court	John G. Yerington Construction Co.	17-66	11-75	NBOL	0.42	0.44	0.43
					NBIL	0.48	0.53	0.51
					SBOL	0.40	0.44	0.42
					SBIL	0.50	0.54	0.52
Mb 12022-03799A (Part)	US 12 from E Limits of Quincy E'ly to the Branch-Hillsdale Co. Line	John G. Yerington Construction Co.	30-58	30-58	EB	0.44	0.47	0.46
					WB	0.50	0.51	0.51
Mb 12022-03799A (Part)	US 12 from the Branch-Hillsdale Co. Line E'ly to Drayton St in Jonesville	Aylington-Cunningham Asphalt Paving	30-58	30-58	EB	0.41	0.42	0.42
					WB	0.47	0.53	0.50
Mb 13043-04117A	I 94 BL (Michigan Ave) from E Limits of Albion NE'ly to 0.5 mi E of Calhoun-Jackson Co. Line	Rieth-Riley Construction Co.	Material Service, Thornton, Ill.	13-38	EB	0.50	0.53	0.51
					WB	0.49	0.52	0.50
Mb 13044-03941A	I 94 BL (Michigan Ave) from Marshall St in Marshall E'ly to old US 12	Rieth-Riley Construction Co.	Material Service, Thornton, Ill.	13-38	EB	0.45	0.50	0.47
					WB	0.47	0.52	0.50
Mb 13061-01718A	M 37 (Van Buren St) from Michigan Ave in Springfield SE'ly to Kendall St in Battle Creek	Rieth-Riley Construction Co.	39-1	13-38	WBOL	0.48	0.51	0.49
					WBCL	0.50	0.51	0.50
					WBIL	0.52	0.53	0.53
M 13131-04259A	M 96 (Dickman Rd) from Kalamazoo-Calhoun Co. Line E'ly and SE'ly 2.46 mi	Rieth-Riley Construction Co.	39-1	8-80	EBOL	0.60	0.62	0.61
					EBIL	0.64	0.66	0.65
					WBOL	0.55	0.58	0.57
					WBIL	0.66	0.66	0.66
Mb 14041-03794A	US 12 from 0.39 mi SE of M 60 SE'ly and E'ly to E Village Limits of Edwardsburg, omitting at M 62	Rieth-Riley Construction Co.	Material Service, Thornton, Ill.	14-36 & Kuerte Conc., Inc. S. Bend Indiana	EB	0.52	0.55	0.54
					WB	0.55	0.57	0.56
Mb 19031-04821A	NB US 27 from 580 ft N of Price Rd N'ly to 670 ft S of Townsend Rd	Spartan Asphalt Paving Co.	47-3	47-43	NBOL	0.53	0.56	0.54
					NBIL	0.61	0.64	0.63
F 21024-00262A	US 2 from W of Co. Rd J 31 E'ly to E of Sturgeon	Payne and Dolan of Wisconsin	75-2	21-73	EB	0.58	0.65	0.63
					WB	0.58	0.67	0.63
M 23042-04618A	M 43 (Saginaw Hwy) from 1365 ft E of Canal Rd E'ly to 681 ft W of Creyts Rd	T. A. Forsberg, Inc.	41-38	19-33	EBOL	0.60	0.60	0.60
					EBIL	0.67	0.69	0.68
					WBOL	0.58	0.62	0.60
					WBIL	0.65	0.67	0.66

1972 CONT.

TABLE 2 (Cont.)
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1972 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Ms 23042-03762A	M 43 (Saginaw Hwy) @ Creyts Rd	Brown Brothers, Inc.	41-38	19-33	EBOL	0.49	0.54	0.51
					EBIL	0.58	0.61	0.60
					WBOL	0.54	0.54	0.54
					WBIL	0.51	0.56	0.54
Mtb 25041-03997A	M 78 (Miller Rd) from SW of Ballenger Rd NE'ly to M 21	Spartan Asphalt Paving Co.	63-4	63-54	EBOL	0.54	0.57	0.56
					EBIL	0.57	0.60	0.59
					WBOL	0.54	0.56	0.55
					WBIL	0.57	0.60	0.59
Mb 25072-03797A	M 54 (Dort Hwy) from 700 ft S of Mohawk St N'ly to 650 ft N of Mitchell St also from 60 ft S of GTW RR overpass N'ly to 535 ft S of Court St and from 50 ft N of Davison St N'ly to 200 ft N of Marland St	Barrett Asphalt Paving Co.	63-4	63-4	NBOL	0.43	0.46	0.44
					NBIL	0.47	0.51	0.50
					SBOL	0.44	0.48	0.46
					SBIL	0.48	0.51	0.50
Mb 25081-01782A (Part)	M 21 from 840 ft E of Morrish Rd E'ly to 165 ft E of Dye Rd	Spartan Asphalt Paving Co.	63-4	63-54	EB	0.58	0.59	0.59
					WB	0.57	0.59	0.58
Mb 25081-01782A (Part)	M 71 from 650 ft W of Norton St E'ly and S'ly to McNeil St in Coronna	Spartan Asphalt Paving Co.	63-4	63-54	EB	0.44	0.44	0.44
					WB	0.47	0.50	0.49
Mtb 25082-00318A	M 21 (Court St) from Saginaw St E'ly to 300 ft E of Greenfield St, omitting from Harrison St to Avon St	Barrett Asphalt Paving Co.	32-4	63-54	EBOL	0.41	0.41	0.41
					EBIL	0.51	0.55	0.53
					WBOL	0.44	0.44	0.44
					WBIL	0.52	0.54	0.53
Mtb 25083-02431A (Part)	M 21 (Davison Rd) from M 54 (Dort Hwy) in Flint E'ly to Covert St	Saginaw Asphalt Paving Co.	63-4	25-29	EBOL	0.47	0.50	0.48
					EBIL	0.57	0.60	0.58
					WBOL	0.47	0.52	0.49
					WBIL	0.57	0.59	0.58
Mtb 25083-02431A (Part)	M 21 (Davison Rd) from Covert St E'ly to W Limits of Lapeer, omitting through Davison	Saginaw Asphalt Paving Co.	63-4	25-29	EB	0.41	0.54	0.48
					WB	0.44	0.53	0.47
Mb 25091-04772A	M 15 from Oakland-Genessee Co. Line N'ly to 1600 ft N of Maple Ave, omitting from N of Hadley Rd N'ly to S of Maple Ave	Bit Con Corp.	47-3	63-4	NB	0.50	0.55	0.52
					SB	0.49	0.52	0.51
Mb 33032-03800A	I 96 BL (Cedar St) from 980 ft N of Jolly Rd N'ly to 60 ft N of Mt. Hope	Spartan Asphalt Paving Co.	47-3	47-43	NBOL	0.42	0.43	0.42
					NBIL	0.46	0.48	0.47
					SBOL	0.44	0.47	0.45
					SBIL	0.47	0.48	0.48
Mb 33043-03847A (Part)	WB M 78 from 1000 ft NE of Lake Lansing Rd NE'ly to 2200 ft NE of Peacock Rd	Spartan Asphalt Paving Co.	47-3	47-43	WBOL	0.32	0.36	0.35
					WBIL	0.42	0.45	0.43
Mb 33043-03847A (Part)	M 52 from 2000 ft N of Noble Rd N'ly to 2000 ft N of Lovejoy Rd (Ingham-Shiawassee Co. Line) omitting Grand River Ave	Spartan Asphalt Paving Co.	47-3	47-43	NB	0.39	0.44	0.42
					SB	0.41	0.48	0.44

1972 CONT.

TABLE 2 (Cont.)
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1972 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mtb 33131-03578A	M 174 (Logan St) from I 96 BL (Grand River Ave) N'ly to Sheridan	Lake Construction Co. and Howell Construction Co.	47-3	47-3	NB SB	0.54 0.51	0.56 0.53	0.55 0.52
M 36021-04636A	US 2 from 9th Ave E'ly on Adams St to River Ave thence S'ly on River Ave to E Genessee St, thence E'ly and NE'ly on E Genessee St to E Adams St	Mathy Construction Co.	22-69	36-40	EB WB	0.54 0.51	0.55 0.54	0.55 0.52
Ms 38082-03003A	I 94 BL (Washington Ave) from approximately 600 ft NW of Main St intersection SE to Higby St	Richardson Asphalt Corp.	30-35 & 47-3	30-35	EBOL EBIL WBOL WBIL	0.40 0.40 0.48 0.46	0.42 0.43 0.51 0.51	0.41 0.42 0.49 0.48
M 39032-04260A	M 96 from 0.14 mi W of Webster St in Village of Augusta E'ly to Kalamazoo-Calhoun Co. Line	Rieth-Riley Construction Co.	39-1	8-80	EBOL EBIL WBOL WBIL	0.60 0.63 0.60 0.65	0.62 0.66 0.64 0.66	0.61 0.64 0.62 0.66
Mb 39102-03801A (Part)	M 89 from 1350 ft W of E Village Limits of Richland E'ly 4.29 mi	Rieth-Riley Construction Co.	3-61	39-1	EB WB	0.57 0.59	0.59 0.60	0.58 0.60
Mb 39102-03801A (Part)	M 37 from 200 ft S of T Drive N (Marvin Rd) N'ly to 75 ft N of V Drive N (Hamilton Rd)	Rieth-Riley Construction Co.	3-61	13-38	NB SB	0.58 0.64	0.60 0.66	0.59 0.65
Mtb 41022-02997A	M 45 (Fulton St and Cascade Rd) from US 131 BR (Division Ave) E'ly to I 96	Michigan Colprovia Co.	41-22	41-16	EBOL EBIL WBOL WBIL	0.61 0.63 0.57 0.62	0.65 0.68 0.64 0.70	0.64 0.66 0.61 0.66
Mtb 41042-02998A	M 21 (Franklin Ave and Eastern Ave) from US 131 E'ly and N'ly to M 45 (Fulton St)	Michigan Colprovia Co.	41-22	41-16	EBOL EBIL WBOL WBIL	0.47 0.39 0.43 0.45	0.50 0.44 0.46 0.47	0.49 0.42 0.44 0.46
Mtb 41042-02999A	M 21 BR from Larue St NE'ly to 453 ft NE of Roys Ave	Michigan Colprovia Co.	41-50	41-50	NBOL NBIL SBOL SBIL	0.38 0.54 0.33 0.49	0.41 0.56 0.35 0.53	0.39 0.55 0.34 0.51
Mb 44012-04789A	M 24 from 210 ft N of Daley Rd N'ly to 100 ft N of Columbiaville Rd	Williams Bros. Asphalt Paving Co.	32-4	63-88	NB SB	0.49 0.50	0.53 0.52	0.51 0.51
Mb 49021-04336A	US 2 from Schoolcraft-Mackinac Co. Line E'ly to Soo Line RR structure, 1.27 mi E of Gould City	Lake Construction Co.	75-5	70-9	EB WB	0.54 0.58	0.65 0.63	0.60 0.61
Mb 49022-04337A Ms 49022-04520A	US 2 from M 117 E'ly to Naubinway	Lake Construction Co.	75-5	70-9	EB WB	0.55 0.51	0.61 0.62	0.58 0.57

TABLE 2 (Cont.)
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1972 AND 1973

1972 CONT.

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 50052-03804A	US 25 - M 59 (Gratiot Ave) from 150 ft N of 21 Mile Rd NE'ly to 590 ft S of 23 Mile Rd	Cooke Contracting Co.	63-4	50-35	NBOL	0.40	0.43	0.41
					NBIL	0.42	0.45	0.43
					SBOL	0.29	0.34	0.32
					SBIL	0.38	0.43	0.41
Mb 52043-03039A	US 41 BR in Marquette from East St E'ly to 100 ft E of Third St	Payne and Dolan of Wisconsin	52-9	52-9	EB	0.53	0.56	0.54
					WB	0.48	0.52	0.50
Mtb 55051-03130A	M 173 from Ferry Dock NW'ly to US 41 in City of Menominee	Fox Valley Construction Co.	55-4	55-4	EBOL	0.48	0.55	0.51
					EBIL	0.49	0.52	0.50
					WBOL	0.46	0.50	0.48
					WBIL	0.46	0.50	0.48
Mb 61023-03805A	M 46 (Apple Ave) from 700 ft E of Maple Island Rd E'ly to 1450 ft W of Ravenna Rd	Kalamazoo Asphalt Construction Co.	41-16	70-9	EB	0.57	0.59	0.58
					WB	0.60	0.63	0.62
Mb 61073-02995A (Part)	US 31 BR (Colby St) from 140 ft W of Franklin St E'ly to SE Limits of Whitehall	Muskegon Asphalt Paving Co.	41-16 & 41-38	70-9	NB	0.24	0.28	0.26
					SB	0.25	0.26	0.26
Mb 61073-02995A (Part)	US 31 BR from SE Limits of Whitehall E'ly to US 31	Muskegon Asphalt Paving Co.	41-16 & 41-38	70-9	NBOL	0.35	0.36	0.36
					NBIL	0.35	0.37	0.36
					SBOL	0.31	0.33	0.32
					SBIL	0.33	0.35	0.34
Mbr 62032-04779A	M 37 from Pierce Rd N'ly to Newaygo-Lake Co. Line	Rieth-Riley Construction Co.	41-16	62-33	NB	0.60	0.62	0.60
					SB	0.60	0.62	0.61
Mtb 63042-02908A	Old M 59 (Auburn Rd) from Opdyke Rd E to M 59	Cooke Contracting Co.	63-4	50-35	EB	0.42	0.45	0.44
					WB	0.44	0.48	0.46
Mb 63051-03806A	NB M 1 (Woodward Ave) from 100 ft S of Trowbridge Rd in Bloomfield Hills NW'ly to 300 ft S of US 10 BR (Square Lake Rd)	Ann Arbor Construction Co.	63-88	63-88	NBOL	0.51	0.55	0.54
					NB#3	0.51	0.54	0.52
					NB#2	0.51	0.53	0.52
					NBIL	0.50	0.56	0.53
Mb 70011-04782A (Part)	M 40 from US 31 in Allegan Co. N'ly and NE'ly to US 31 in Ottawa Co.	Westshore Construction Co.	70-36	70-39	EB	0.40	0.43	0.42
					WB	0.38	0.41	0.40
Mb 70011-04782A (Part)	US 31 BR from 28th St N'ly to 13th St, all in Ottawa Co.	Westshore Construction Co.	70-36	70-39	NBOL	0.44	0.44	0.44
					NBIL	0.50	0.54	0.52
					SBOL	0.44	0.48	0.47
					SBIL	0.50	0.51	0.50
I 72061-00997A	I 75 from 1.2 mi W of Co. Rd 500 NW'ly to 0.1 mi N of 9 Mile Hill Rd	The Hicks Co.	65-7	65-7	NBOL	0.68	0.71	0.69
					NBIL	0.65	0.70	0.68
					SBOL	0.71	0.76	0.72
					SBIL	0.69	0.71	0.70

TABLE 2 (Cont.)
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1972 AND 1973

1972 CONT.

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mtb 73073-02567A	M 81 from State St and Carolina St S'ly on Carolina St to Genesee Ave thence E'ly and SE'ly to 140 ft NW of Whittier St, omitting the bridge over the Saginaw River	Saginaw Asphalt Paving Co.	47-3	63-54	EB WB	0.53 0.52	0.56 0.59	0.54 0.57
Mb 73151-03960A	NB M 15 from M 81 NW'ly to Saginaw-Bay Co. Line	Midland Contracting Co.	75-5	63-54	NBOL NBIL	0.46 0.58	0.48 0.62	0.47 0.60
Mb 75022-04338A	US 2 from 0.54 mi SW of M 77, E'ly to Schoolcraft-Mackinac Co. Line	Lake Construction Co.	75-5	70-9	EB WB	0.60 0.60	0.62 0.61	0.61 0.61
Mb 77032-03812A	US 25 BR (Military St and Electric St) from Reid St NE'ly and E'ly to Court St, omitting bridge over the RR	Molesworth Contracting Co.	63-4	74-51	NBOL NBIL SBOL SBIL	0.48 0.46 0.51 0.50	0.52 0.48 0.52 0.52	0.50 0.47 0.51 0.51
Mb 78042-03813A (Part)	M 86 (Control Section 78061) from M 66 W'ly to E Limits Centerville, omitting 0 + 00 to 7 + 75, 65 + 25 to 169 + 00, and 203 + 00 to 232 + 00	Rieth-Riley Construction Co.	Material Service Thornton, Ill.	78-12	EB WB	0.57 0.59	0.70 0.68	0.64 0.63
SS 78062-01086A	M 86 (South St, Blackstone St and State St) from 681 ft W of intersection of South St and Bowman St E'ly to E of State St-Burr Oak Rd intersection in Colon	John G. Yerington Construction Co.	12-44	12-44	EBOL EBIL WBOL WBIL	0.65 0.54 0.60 0.56	0.67 0.56 0.62 0.58	0.66 0.55 0.61 0.58
Mb 79032-03964A	M 15 from 165 ft SE of Saginaw-Tuscola Co. Line SE'ly to West St in Vassar	Saginaw Asphalt Paving Co. and Midland Contracting Co.	32-4	25-4	NB SB	0.46 0.46	0.50 0.49	0.48 0.48
Mb 79061-03814A (Part)	M 81 from Handy Rd NE'ly to S Limits of Caro	Frank Strausburg and Son	63-4	25-8	EB WB	0.54 0.56	0.57 0.59	0.55 0.57
Mb 79061-03814A (Part)	M 24 from Gun Club Rd N'ly to Frank St in Caro	Frank Strausburg and Son	63-4	25-8	NB SB	0.49 0.52	0.53 0.56	0.51 0.53
Mb 81011-03848A	M 52 from 90 ft S of old US 12 N'ly to 35 ft S of Penn Central RR crossing	Thompson McCully Co. and Ann Arbor Construction Co.	47-3	47-3	NB SB	0.38 0.37	0.42 0.41	0.40 0.38
I 81062-05273A	EB I 94 from 1283 ft E of Carpenter Rd E'ly to 1314 ft E of NB US 12	Cooke Contracting Co.	47-3	47-3	EBOL EBIL	0.29 0.39	0.32 0.40	0.31 0.40
I 81063-01129A	I 94 from the Ford Lake Bridge E'ly to 1334 ft E of Harris Rd structure carrying Grove St over I 94	Washtenaw Asphalt	47-3	47-3	EBOL EBCL EBIL WBOL WBCL WBIL	0.47 0.48 0.51 0.46 0.48 0.56	0.47 0.50 0.55 0.50 0.52 0.58	0.47 0.49 0.53 0.48 0.50 0.57

1972 CONT.

TABLE 2 (Cont.)
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1972 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
U 82061-01183A	US 12 (Michigan Ave) from between Beech Daly Rd and Gulley Rd in Dearborn Hgts. E'ly to US 24 (Telegraph Rd)	C. J. Rogers, Inc.	E. C. Levy (Dix)	E. C. Levy (Dix)	EBOL	0.50	0.51	0.50
					EB#3	0.50	0.54	0.52
					EB#2	0.59	0.60	0.60
					EBIL	0.59	0.62	0.61
					WBOL	0.51	0.56	0.54
					WB#3	0.48	0.55	0.52
					WB#2	0.53	0.58	0.56
					WBIL	0.57	0.60	0.58
Mb 82061-03987A	US 12 (Michigan Ave) from 250 ft W of Denton Rd E'ly to Weithoff Rd in Inkster, omitting from the C & O RR overpass at the W City Limits of Wayne to 4th St in Wayne	Detroit Asphalt Paving Co.	E. C. Levy (Trenton and Detroit)	E. C. Levy (Dix and Detroit)	W of Wayne			
					EBOL	0.30	0.32	0.31
					EBIL	0.38	0.38	0.38
					WBOL	0.34	0.35	0.34
					WBIL	0.41	0.42	0.42
					In Wayne			
					WBOL	0.41	0.43	0.42
					WB#3	0.34	0.38	0.36
					WB#2	0.40	0.43	0.42
					WBIL	0.40	0.49	0.45
					E of Wayne			
					EBOL	0.28	0.32	0.30
					EBIL	0.34	0.35	0.35
					WBOL	0.34	0.36	0.35
					WBCL	0.32	0.35	0.33
					WBIL	0.37	0.39	0.38
Mb 82062-04786A	US 12 from 1470 ft E of M 39 (Southfield Expressway) E'ly to Chavin St omitting at Greenfield Rd	Cooke Contracting Co.	47-3	47-3	EBOL	0.46	0.48	0.47
					EB#3	0.44	0.46	0.45
					EB#2	0.50	0.54	0.52
					EBIL	0.51	0.55	0.53
					WBOL	0.46	0.52	0.49
					WBCL	0.48	0.52	0.51
					WBIL	0.54	0.58	0.56
Mtb 82071-02563A	M 85 - US 25 from Toronto St N'ly and NE'ly to Clark St in City of Detroit	Ajax Paving Ind., Inc.	E. C. Levy (Dix)	E. C. Levy (Dix)	M 85 - US 25 SW from Clark St			
					NBOL	0.33	0.36	0.34
					NBIL	0.39	0.42	0.40
					SBOL	0.31	0.34	0.32
					SBIL	0.45	0.46	0.45

TABLE 2 (Cont.)
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1972 AND 1973

1972 CONT.

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mtb 82071-02563A (Cont.)					W of I 75 overpass			
					NBOL	0.36	0.39	0.38
					NBCL	0.34	0.38	0.36
					NBIL	0.32	0.35	0.34
					SBOL	0.41	0.44	0.43
					SBCL	0.35	0.36	0.36
					SBIL	0.49	0.50	0.49
Mb 82141-03966A	M 102 (8 Mile Rd) from Garfield St E'ly to M 39	Stolaruk Asphalt Paving Co.	47-3	47-3	EBOL	0.26	0.27	0.27
					EBCL	0.24	0.28	0.26
					EBIL	0.29	0.33	0.31
					WBOL	0.17	0.19	0.18
					WBCL	0.26	0.26	0.26
					WBIL	0.30	0.32	0.31
U 82142-009-(01308A)	M 102 from E side John Lodge interchange E'ly to W Limits of Ferndale	Stolaruk Asphalt Paving Co.	47-3 & 63-48	47-3 & 63-48	EBOL	0.46	0.50	0.48
					EB#3	0.48	0.50	0.49
					EB#2	0.48	0.52	0.49
					EBIL	0.49	0.52	0.51
					WBOL	0.46	0.50	0.48
					WB#3	0.50	0.52	0.51
					WB#2	0.48	0.50	0.49
					WBIL	0.46	0.49	0.48
Mb 82211-01807A	M 85 (Fort St) from Sibley Rd in Riverview N'ly and NE'ly to I 75 - US 25 (Fisher Freeway)	Detroit Asphalt Paving Co.	47-3	47-3	NBOL	0.30	0.41	0.37
					NBIL	0.39	0.49	0.44
					SBOL	0.15	0.46	0.35
					SBIL	0.36	0.48	0.43
T 98003-04172A	I 96 BL (Cedar St) from 660 ft S of Miller Rd N'ly to 515 ft S of Jolly Rd	Spartan Asphalt Paving Co.	47-3	47-43	NBOL	0.41	0.44	0.43
					NBIL	0.44	0.47	0.46
					SBOL	0.40	0.46	0.42
					SBIL	0.45	0.49	0.47
T 98003-04173A T 98003-04174A	M 43 (Saginaw St) from Theo St E'ly to W of Waverly Rd, Eaton Co. and E of Waverly Rd E to Catherine St, Ingham Co.	Rieth-Riley Construction Co.	41-38	19-33	EBOL	0.51	0.55	0.53
					EBIL	0.49	0.56	0.53
					WBOL	0.50	0.55	0.53
					WBIL	0.51	0.57	0.54
Mm 2 BA-7A (Control Section 03023)	M 89 E from M 40 in Allegan	Rieth-Riley Construction Co.	3-61	3-44	EBOL	0.46	0.48	0.47
					EBIL	0.41	0.43	0.42
					WBOL	0.44	0.48	0.46
					WBIL	0.41	0.44	0.42

TABLE 2 (Cont.)

BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1972 AND 1973

1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 13061-04838A	M 37 (Michigan Ave) from Bedford Rd SE'ly to Van Buren St, City of Battle Creek	Reith-Riley Construction Co.	39-1	13-38	NBOL	0.64	0.68	0.66
					NBIL	0.63	0.65	0.64
					SBOL	0.61	0.63	0.62
					SBIL	0.60	0.61	0.61
Mtb 13072-04258A	US 27 from I 94 N'ly to 254 ft N of Calhoun-Eaton Co. Line	Reith-Riley Construction Co.	13-86	13-8	NB	0.46	0.50	0.48
					SB	0.49	0.54	0.52
Mbr 13121-05171A	I 94 BL (Columbia Ave) from I 94 NE'ly 1.20 mi to Skyline Dr SW of Battle Creek	Reith-Riley Construction Co.	39-1	13-38	NB	0.53	0.57	0.55
					SB	0.45	0.46	0.46
Mb 21022-05203A	US 2, US 41, and M 35 from 250 ft N of C&NW RR crossing intermittently to to 1.2 mi N of Escanaba River	Payne and Dolan of Wisconsin	21-46	21-65	EBOL	0.30	0.36	0.32
					EBIL	0.40	0.44	0.42
					WBOL	0.39	0.46	0.42
					WBIL	0.30	0.46	0.38
Mbr 33081-04974A (Part)	WB M 43 (E Grand River) from 100 ft W of Homer St W'ly 0.833 mi to 170 ft W of Marshall St, City of Lansing	Spartan Asphalt Paving Co.	47-3	47-43	WBOL	0.33	0.39	0.35
					WB#3	0.21	0.41	0.33
					WB#2	0.35	0.36	0.36
					WBIL	0.37	0.40	0.39
Mbr 33081-04974A (Part)	I 96 BL (W Grand River) from 1350 ft W of Waverly Rd SE'ly to 150 ft E of Capital Ave, Clinton and Ingham Counties	Spartan Asphalt Paving Co.	47-3	47-43	EBOL	0.44	0.47	0.46
					EBIL	0.49	0.51	0.51
					WBOL	0.39	0.43	0.41
					WBIL	0.51	0.52	0.52
Ms 41062-04233A	M 11 (28th St) from Highgate Ave E'ly to 250 ft E of Buchanan Ave	Michigan Colprovia Co.	41-16	41-22	EBOL	0.41	0.44	0.42
					EBIL	0.44	0.47	0.46
					WBOL	0.40	0.42	0.41
					WBIL	0.47	0.48	0.48
Mb 41062-04843A	M 11 (28th St) from structure over C&O RR and Chicago Dr E'ly to Highgate Ave, Kent County	Michigan Colprovia Co.	41-16	41-22	EBOL	0.43	0.45	0.44
					EBIL	0.46	0.48	0.47
					WBOL	0.49	0.52	0.51
					WBIL	0.47	0.48	0.47
Mb 49031-05208A (Part) [1]	US 2 from Soo Line RR (1.27 mi NE of Gould City) E'ly to M 117	Hodgkiss and Douma, Inc.	75-5	49-97	EB	0.52	0.56	0.53
					WB	0.52	0.54	0.53
Mb 55021-05212A (Part)	US 41 from Menominee N'ly, intermittently to US 2	Fox Valley Construction Co.	75-5	70-9	NB	0.38	0.47	0.43
					SB	0.38	0.47	0.42
Mb 55021-05212A (Part)	US 41 in Powers	Payne and Dolan of Wisconsin	55-95	55-149	NBOL	0.53	0.54	0.54
					NBIL	0.38	0.42	0.40
					SBOL	0.49	0.50	0.49
					SBIL	0.31	0.34	0.33

[1] See also 1973 Bit Agg

TABLE 2 (Cont.)
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1972 AND 1973

1973 CONT.

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 55021-05212A (Part)	US 2 from Vulcan E'ly, intermittently to Dickinson County	Payne and Dolan of Wisconsin	55-95	55-149	EB	0.38	0.50	0.44
					WB	0.36	0.42	0.39
Mb 55021-05212A (Part)	US 2 - US 41, E of Powers	Payne and Dolan of Wisconsin	55-95	55-149	EB	0.45	0.46	0.45
					WB	0.38	0.40	0.39
F 59042-00810A	US 131 relocation from S of Almy Rd NE'ly and E'ly to existing US 131 and M 46, N of Howard City	Saginaw Asphalt Co.	41-69	62-63	NB	0.45	0.46	0.46
					SB	0.45	0.48	0.47
Mb 63071-04780A	M 15 from 8.297 mi S of Oakland-Genesee Co. Line N to Co. Line	Ann Arbor Construction Co.	63-4	63-4				
	N of Ortonville				NB	0.43	0.50	0.48
					SB	0.45	0.52	0.48
	S of Ortonville				NB	0.34	0.38	0.35
					SB	0.42	0.45	0.43
Mb 73062-05917A (Part) [2]	M 46 from Elm St E'ly to RR tracks, City of Saginaw	Saginaw Asphalt Paving Co.	47-3	-----	EBOL	0.52	0.54	0.53
					WBOL	0.48	0.54	0.52
Mb 78011-04785A	M 103 from state line to US 12 to Mann Rd	Reith-Riley Construction Co.	39-1	12-44 & 80-20	NB	0.46	0.48	0.47
					SB	0.42	0.46	0.44
	US 12 from M 103 E to Mann Rd (Control Section 78021)	Reith-Riley Construction Co.	39-1	12-44 & 80-20	EB	0.36	0.40	0.38
					WB	0.36	0.37	0.37
	US 131 from state line N to US 12 (Control Section 78031)		Material Services, Thornton, Ill	12-44	NB	0.35	0.38	0.37
					SB	0.31	0.34	0.33
	M 86 from 650 ft S of S limits of Three Rivers N to M 60 - US 131 BR (Control Section 78061)	Reith-Riley Construction Co.	Material Services, Thornton, Ill	12-44	NB	0.46	0.48	0.47
					SB	0.51	0.55	0.52
U 82081-017 (01195A)	M 153 (Ford Rd) commencing approximately 330 ft E of Greenfield Rd, thence E'ly to approximately 330 ft E of Appoline St	Bit Con Corp	E. C. Levy & 47-3	E. C. Levy & 47-3	EBOL	0.30	0.34	0.31
					EBCL	0.30	0.31	0.30
					EBIL	0.37	0.39	0.38
					WBOL	0.42	0.45	0.44
					WBCL	0.31	0.35	0.33
					WBIL	0.54	0.56	0.55
U 82142-01310A (Part)	M 102 from W city limits of Ferndale E'ly to to E of Dequindre in Warren	Stolaruk Asphalt Paving	47-3	47-3	EBOL	0.28	0.30	0.29
					EB#3	0.31	0.32	0.32
					EB#2	0.31	0.33	0.32
					EBIL	0.33	0.33	0.33
					WBOL	0.32	0.35	0.34
					WB#3	0.27	0.28	0.27
					WB#2	0.27	0.30	0.28
					WBIL	0.29	0.34	0.32

[2] See also 1973 Misc Bit

TABLE 3
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1972 AND 1973

1972

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mb 03021-03792A	M 89 from W Limits of Fennville E'ly to M 40	West Shore Construction Co.	70-24	70-39	EB WB	0.42 0.46	0.55 0.54	0.49 0.50
Mb 05072-03828A (Part)	US 131 from N Jct M 32 N approximately 2 mi	Peninsula Asphalt Co.	5-47	-----	NB SBTL SBIL	0.56 0.55 0.64	0.63 0.59 0.65	0.59 0.57 0.64
Mb 05072-03828A (Part)	M 75 from N Jct US 131 S'ly 1.3 mi in Charlevoix Co. (Control Section 15071)	Peninsula Asphalt Co.	5-47	-----	NB SB	0.45 0.45	0.48 0.46	0.46 0.45
Mb 10032-04771A	US 31 from 0.5 mi W of Pioneer Rd E'ly to Benzie-Grand Traverse Co. Line	Peninsula Asphalt Co.	45-19	-----	EB WB	0.52 0.53	0.56 0.56	0.54 0.55
F 16032-00205A	M 27 from 143 ft NE of Penn Central RR NE'ly to 440 ft N of M 33	Lake Construction Co.	16-69	-----	NB SB	0.61 0.62	0.64 0.62	0.62 0.62
Mb 23071-03796A	M 100 from US 27 and M 78 N'ly to 465 ft S of M 43, omitting at GTRR crossing in Potterville	Rieth-Riley Construction Co.	33-99	-----	NB SB	0.45 0.47	0.50 0.50	0.48 0.48
Mb 30011-02755A	M 49 from Ohio-Michigan Line N'ly to US 12	Ayling-Cunningham Asphalt Paving	30-48	-----	NB SB	0.52 0.49	0.66 0.62	0.57 0.54
Mb 30071-03802A (Part)	M 34 from 310 ft E of US 127 E'ly to 55 ft E of Maplegrove St (Control Section 46041)	Ayling-Cunningham Asphalt Paving	30-58	-----	EB WB	0.37 0.37	0.41 0.38	0.39 0.37
Mb 30071-03802A (Part)	US 127 from 565 ft N of Cincinnati RR N'ly to 3735 ft N of M 34	Ayling-Cunningham Asphalt Paving	30-58	-----	NB SB	0.30 0.34	0.39 0.43	0.35 0.38
Mb 33091-04775A (Part)	M 52 from M 106 N'ly to M 36, S Jct	Ann Arbor Construction Co. and Howell Construction Co.	81-77 & 47-26	-----	NB SB	0.54 0.55	0.57 0.60	0.56 0.58
Mb 33091-04775A (Part)	M 36 from M 52 E'ly and S'ly to M 106	Ann Arbor Construction Co. and Howell Construction Co.	81-77 & 47-26	-----	EB WB	0.58 0.65	0.65 0.70	0.61 0.67
Mb 39103-04770A (Part)	M 43 from N Limits of Richland N'ly to Bush St in Denton	Rieth-Riley Construction Co.	39-1	-----	NB SB	0.58 0.52	0.61 0.54	0.60 0.53
Mb 39103-04770A (Part)	M 89 from 27th St E'ly 2.84 mi to M 43	Rieth-Riley Construction Co.	39-1	-----	EB WB	0.56 0.61	0.60 0.64	0.58 0.63
Mb 43012-03827A	M 37 from US 10 in Baldwin N'ly to B01 of 43012	Rieth-Riley Construction Co.	62-49	-----	NB SB	0.49 0.52	0.52 0.57	0.50 0.55
Mb 47041-03803A	M 36 from M 106 in Gregory E'ly to Pinkney	Howell Construction Co.	47-26	-----	EB WB	0.47 0.42	0.52 0.57	0.49 0.49
Mb 52043-03039A (Part)	US 41 from Alger-Marquette Co. Line NW'ly to Co. Rd 496	Payne and Dolan of Wisconsin	2-1	-----	NB SB	0.65 0.64	0.70 0.69	0.68 0.66
Mb 62012-04778A	M 20 from 11.4 mi SW of Newaygo-Mecosta Co. Line N'ly and E'ly to 3.5 mi E of Co. Line	Rieth-Riley Construction Co.	62-3	-----	EB WB	0.59 0.60	0.61 0.63	0.60 0.62

1972 CONT.

TABLE 3 (Cont.)
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1972 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Mtb 65032-04749A	M 55 from 2 mi W of West Branch W'ly and NW'ly to M 76	Central Paving Co.	65-7	-----	EB	0.58	0.62	0.59
					WB	0.46	0.51	0.49
Mb 65032-04781A (Part)	M 76 from I 75 BL NW'ly and W'ly to Second St in West Branch	Central Paving Co.	65-7	-----	EBOL	0.49	0.52	0.51
					EBIL	0.49	0.50	0.50
					WBOL	0.51	0.51	0.51
					WBIL	0.48	0.49	0.48
Mb 65032-04781A (Part)	M 33 from 300 ft S of the W Branch of the Rifle River N'ly to M 55	Central Paving Co.	65-7	-----	NB	0.56	0.58	0.57
					SB	0.52	0.55	0.54
F 66023-00955A	M 28 from 926 ft E of US 45 in Bruce Crossing E'ly and S'ly to approximately 1 mi W of Trout Creek	Fox Valley Construction Co. and George Hocking Construction Co.	66-33	-----	EB	0.53	0.67	0.59
					WB	0.45	0.68	0.60
Mb 71051-03808A (Part)	M 65 from 475 ft S of State St, in Posen, N'ly to US 23	Lake Construction Co.	71-40	-----	NB	0.62	0.67	0.64
					SB	0.63	0.67	0.65
Mb 71051-03808A (Part)	US 23 from 1820 ft N of Mail Trail Creek N'ly and W'ly to 75 ft W of M 65, omitting from 1000 ft S of Presque Isle Rd SE'ly 6.23 mi	Lake Construction Co.	71-40	-----	NB	0.64	0.67	0.65
					SB	0.65	0.68	0.67
Mb 71051-03808A (Part)	US 23 BR from US 23 N'ly to Clair Ave in Rogers City	Lake Construction Co.	71-40	-----	NB	0.59	0.62	0.61
					SB	0.57	0.58	0.58
Mb 74071-03961A	US 25 (Lakeshore Dr) from Galbraith Line Rd N'ly and NW'ly to Wall St	Molesworth Contracting Co.	77-15	-----	NB	0.41	0.43	0.42
					SB	0.46	0.49	0.47
Mb 77012-03962A	M 19 from 920 ft N of Mill Creek in Brockway N'ly and W'ly to 1180 ft N of C&O RR crossing in Yale	Molesworth Contracting Co.	77-15	-----	NB	0.49	0.51	0.50
					SB	0.51	0.54	0.52
Mb 79011-03963A	M 138 from 320 ft S of Oakley Rd N'ly and E'ly to Unionville Rd	Midland Contracting Co.	79-42	-----	EB	0.48	0.61	0.55
					WB	0.48	0.60	0.55
Mb 80041-03816A	M 43 from 210 ft NW of 73rd St SE'ly to 740 ft SE of 69th St	Klett Construction Co.	80-26	-----	EB	0.46	0.49	0.48
					WB	0.49	0.51	0.50
Ms 83012-04995A	M 37 - M 115 East and West of Mesick	Laman Asphalt Paving Co.	43-47	-----	E Limits of Mesick			
					EB	0.44	0.49	0.47
					WB	0.46	0.50	0.48
					W Limits of Mesick			
					EBOL	0.36	0.40	0.39
					EBIL	0.38	0.42	0.39
					WBOL	0.42	0.46	0.44
					WBIL	0.33	0.34	0.34

TABLE 3 (Cont.)
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1972 AND 1973

	Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
				Coarse	Fine		Low	High	Avg
1972 CONT.	Mb 83053-04788A	M 115 from 250 ft NW of W Junction of M 37 NW to W Co. Line	Laman Asphalt Paving Co.	43-47	-----	EB WB	0.55 0.49	0.57 0.52	0.56 0.50
	Mm 2BA-1C (07021)	M 28 from 0.71 mi E of Houghton Co. Line E'ly intermittently 3.667 mi	Fox Valley Construction Co.	52-1	------	EB WB	0.57 0.53	0.58 0.58	0.58 0.56
1973	RF 02041-00010A	M 28 from Rothfoot roadside park E'ly 6.211 mi to 24 ft conc. pavement	Payne and Dolan of Wisconsin	52-9	------	EB WB	0.42 0.37	0.48 0.42	0.45 0.40
	Mb 17061-03947A	M 28 from Luce-Chippewa Co. Line E'ly to 275 ft W of M 123	Hodgkiss and Douma, Inc.	48-20	17-10	EB WB	0.41 0.38	0.44 0.43	0.42 0.40
	Mb 26011-04773A (Part)	M 61 from old US 27 E'ly intermittently to M 18	The Hicks Co.	26-8	------	EB WB	0.46 0.46	0.54 0.54	0.50 0.49
	Mb 26011-04773A (Part)	M 18 from M 61 in Gladwin N'ly to 380 ft N of Clending Rd; also on M 18 from 80 ft S of Burgess Rd N'ly to 120 ft N of Wood Rd	The Hicks Co.	26-8	------	NB SB	0.42 0.40	0.56 0.53	0.51 0.50
	Mbr 27022-05922A	US 2 from 3.2 mi SE of Wakefield SE'ly intermittently to 0.25 mi W of W Junction with M 64	Mathy Construction Co.	27-52	------	EB WB	0.40 0.46	0.56 0.55	0.49 0.49
	Mb 33021-04774A	M 36 from 150 ft NW of Curtis St in Mason S'ly and E'ly intermittently to 0.5 mi W of M 52	Spartan Asphalt Paving Co.	19-46	------	EB WB	0.29 0.24	0.47 0.50	0.36 0.37
	Mb 49031-05208A (Part) [1]	M 117 from Engadine N'ly to Mackinac-Luce Co. Line	Hodgkiss and Douma, Inc.	49-74	49-97	NB SB	0.52 0.49	0.55 0.54	0.54 0.52
	Mb 49041-05209A	M 134 from 1.96 mi W of M 129 E'ly to Mackinac-Chippewa Co. Line; also on M 134 at one location approximately 2.27 mi W of Cedarville	Lake Construction Co.	49-53	------	EB WB	0.34 0.34	0.39 0.37	0.36 0.36
	Mb 66032-06027A (Part)	US 45 from M 28 N'ly 13.836 mi to Rockland	Fox Valley Construction Co.	66-97	------	NBTL NB SBTL SB	0.50 0.44 0.52 0.42	0.53 0.49 0.53 0.47	0.52 0.46 0.53 0.45
	Mb 66032-06027A (Part)	M 38 from M 26 E'ly 6.305 mi to 0.394 mi E of Ontonagon-Houghton Co. Line	Fox Valley Construetion Co.	66-97	-----	EB WB	0.52 0.42	0.53 0.46	0.52 0.43
	Mbr 83032-05022A	US 131 from 270 ft S of S Jct with M 42 N'ly to 340 ft N of N Limits of Manton	Johnson-Greene Co.	83-57	-----	NBOL NBIL SBOL SBIL	0.43 0.27 0.44 0.21	0.49 0.41 0.48 0.45	0.45 0.36 0.46 0.33

[1] See Table 2 for additional data.

TABLE 4
MISCELLANEOUS BITUMINOUS SURFACES CONSTRUCTED IN 1972

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Double Seal								
Mm 2SC-1A (52011)	M 95 from approximately 3 mi S of Republic N'ly 4.895 mi	Fox Valley Construction Co.	52-1	----	NB	0.57	0.63	0.60
					SB	0.48	0.51	0.49
Single Seal								
Mm 2SC-5B (41031)	M 37 from approximately 100 ft S of 108th St N'ly 4.87 mi to approximately 267 ft S of Kraft Rd	Rieth-Riley Construction Co.	41-22	----	S of Kraft Rd			
					NB	0.38	0.47	0.42
					SB	0.31	0.38	0.35
					N of Caledonia			
					NB	0.35	0.53	0.43
					SB	0.37	0.52	0.45
Mm 2SC-6C (74032)	M 19 from M 46 N'ly to the Sanilac-Huron Co. Line	C. R. Hunt Construction Co.	63-4	----	NB	0.61	0.70	0.66
					SB	0.60	0.70	0.65

TABLE 5
CONVENTIONAL CONCRETE AND BITUMINOUS PAVEMENT SUMMARY

Surface Type	Service Year When Tested	Total Lanes Tested	Total Lane Miles Tested	Average Friction Level
Concrete	Initial	13	32.560	0.56
	1	82	163.021	0.55
Bituminous Concrete	Initial	70	198.632	0.43
	1	239	634.106	0.49
Bituminous Aggregate	Initial	26	172.222	0.45
	1	69	365.036	0.53
Double Seal	1	2	9.790	0.55
Single Seal	1	6	46.420	0.48

SECTION II

FRICTION LEVELS DETERMINED FOR PAVEMENTS AFTER FIVE YEARS OF SERVICE

Friction Levels Determined for Pavements After Five Years of Service

Tables 6 and 7 contain skid test results from 15 portland cement concrete projects consisting of 73 lanes which were constructed in 1968. Initial service year tests were conducted on six of these projects and resulting Wsf values averaged 0.52. Eight of the projects were first tested in 1969, after a one-year service period and friction levels for these averaged 0.46. After five years of service, all 15 projects were tested. Wsf values for the 73 lanes averaged 0.43. Eighteen percent of the 145.623 lane miles averaged less than 0.40.

Tables 8 and 9 list skid test results of 44 bituminous concrete projects constructed during 1968. In all, 145 lanes (452.405 lane miles) were tested. Average coefficients of friction determined initially and after a one-year service level were 0.47 and 0.48, respectively. Skid tests were conducted again in 1973, after five service years on these same 44 projects and Wsf values averaged 0.48. Twenty-two percent of the lane miles yielded five-year Wsf values below 0.40.

Tables 10 and 11 contain skid test results from 17 bituminous aggregate (4.11) projects of which 46 lanes (291.180 lane miles) were tested. Twenty-six of the lanes were tested during their initial service year; the average Wsf value was 0.41. The remaining 20 were tested after a one-year service period and resulting skid tests yielded an average friction level of 0.51. Skid tests were conducted in 1973 on these bituminous aggregate projects. The overall five-year average Wsf value was 0.57. All five-year friction levels averaged 0.44 or higher.

Tables 12 and 13 contain an assortment of bituminous surfaces tested in their initial service year, at the one-year level and again after five-years.

TABLE 6
CONCRETE PAVEMENTS TESTED DURING 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Average Coefficient of Wet Sliding Friction	
			Coarse	Fine		1968	1973
I 06111-007	I 75 from N of M 61 N to S of Maple Ridge Rd	Denton Const. Co. & Sargent Contracting Co.	65-7	65-7	NBOL	0.45	0.43
					NBIL	0.52	0.55
					SBOL	0.47	0.46
					SBIL	0.49	0.57
U 33061-020	M 43 from W of Catherine St E to Logan St	Eisenhour Const. Co., Inc.	41-46	19-33	WBOL	0.48	0.28
					WBCL	0.51	0.29
					WBIL	0.52	0.25
I 63174-070	I 75 from Wayne Co. Line N'ly to 100 ft S of Berhard Ave in Hazel Park	The Cooke Cont. Co.	E. C. Levy (Trenton & Dix)	63-7	NBOL	0.53	0.41
					NBCL	0.57	0.47
					NBIL	0.58	0.50
					SBOL	----	0.44
					SBCL	----	0.51
					SBIL	----	0.50
BI 82195B, C19 BI 82195D, C20 BI 82251B, C45	I 75 from Lodge Freeway E to St. Antoine	L. A. Davidson Co.	E. C. Levy, Dix	63-55 & 47-15	EBOL	0.59	0.39
					EB#3	0.52	0.36
					EB#2	0.50	0.40
					EBIL	0.45	0.42
					WBOL	0.59	0.41
					WB#3	0.48	0.37
					WB#2	0.43	0.37
					WBIL	0.61	0.37
BI 82252-142	I 75 from Victor Ave N'ly to Oakland Co. Line	The Cooke Cont. Co.	E. C. Levy (Trenton & Dix)	63-7 & 82-5	NBOL	----	0.42
					NB#3	----	0.41
					NB#2	----	0.47
					NBIL	----	0.53
					SBOL	----	0.39
					SB#3	----	0.43
					SB#2	----	0.50
					SBIL	----	0.54

TABLE 7
CONCRETE PAVEMENTS TESTED DURING 1969 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Average Coefficient of Wet Sliding Friction	
			Coarse	Fine		1969	1973
I 06111-009	I 75 comm. approx. 1400' SE of Maple Ridge Rd, thence NW'ly on I 75 reloc to Arenac-Ogemaw Co. Line	Sargent Constr. Co.	65-7	65-7	NBOL	0.55	0.47
					NBIL	0.44	0.64
					SBOL	0.54	0.43
					SBIL	0.54	0.63
I 33044-037	I 496 from Waverly Rd E to W of Middle St, City of Lansing	Eisenhour Constr. Co.	41-46	19-33	EBOL	0.54	0.27
					EBIL	0.56	0.30
					WBOL	0.46	0.30
					WBIL	0.60	0.34
F 41132-004	US 131 reloc comm. approx. 770' S of N Park St, thence N'ly to Post Rd	L. W. Edison	41-46	41-46	NBOL	0.42	0.47
					NBIL	0.62	0.45
					SBOL	0.35	0.52
					SBIL	0.53	0.47
Ms 63031-017	Comm. on US 24 (Telegraph) at I 696 (NW exp.) thence N'ly on US 24 to 1220' N of 12 Mile Rd, City of Southfield	Anderson & Ruzzin, Inc.	E. C. Levy (Trenton & Dix)	63-55	NBOL	0.40	0.42
					NB#3	0.38	0.37
					NB#2	0.36	0.45
					NBIL	0.47	0.38
					SBOL	0.36	0.33
					SB#3	0.33	0.34
					SB#2	0.37	0.34
					SBIL	0.41	0.35
BI 82251-054	On Chrysler Exp. from Edsel Ford Exp. to Clay Ave	L. A. Davidson	E. C. Levy (Dix)	47-15, 50-41 & 63-55	NBOL	0.48	0.41
					NB#3	0.39	0.37
					NB#2	0.44	0.44
					NBIL	0.52	0.48
					SBOL	0.40	0.40
					SB#3	0.42	0.38
					SB#2	0.48	0.42
					SBIL	0.50	0.44
I 82252-079 BI 82252-118	I 75 comm. at a point 187.94' N of Holbrook Ave thence to a point 142.23' N of Carpenter	The Cooke Cont. Co.	E. C. Levy (Trenton & Dix)	63-7	NBOL	0.44	0.44
					NB#3	0.40	0.41
					NB#2	0.51	0.50
					NBIL	0.53	0.47
					SBOL	0.46	0.47
					SB#3	0.48	0.44
					SB#2	0.50	0.49
					SBIL	0.55	0.48
BI 82252-173	Chrysler Fwy (I 75) in City of Detroit, from Carpenter to N of Victor	L. A. Davidson	E. C. Levy (Dix)	47-15	NBOL	0.44	0.44
					NB#3	0.37	0.39
					NB#2	0.49	0.44
					NBIL	0.47	0.45
					SBOL	0.42	0.45
					SB#3	0.40	0.39
					SB#2	0.42	0.43
					SBIL	0.53	0.53

TABLE 8
BITUMINOUS CONCRETE PAVEMENTS (4.12) TESTED DURING 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Average Coefficient of Wet Sliding Friction	
			Coarse	Fine		1968	1973
Mb 08011-003	M 43 from Shultz Rd N to M 37	Reith-Riley Const. Co., Inc.	41-38	8-58	EB	0.50	0.61
					WB	0.47	0.65
Mb 08052-004	M 66 from S Limits of Nashville N to N of Greggs Crossing Rd	Williams Bros. Asphalt Paving Co.	34-51	34-51	NB	0.59	0.47
					SB	0.62	0.45
Mb 11052-009	US 33 from NW of I 94 N to S Limits of St. Joseph; also from N Limits of Benton Harbor N to I 196	John G. Yerington Co.	41-22 & US Steel Gary, Indiana	11-75	NB	0.37	0.44
					SB	0.37	0.51
Mb 14011-008	M 40 from Berrien-Cass Co. Line NE to W of West City Limits of Dowagiac	John G. Yerington Co.	76-9	14-36	NB	0.48	0.70
					SB	0.48	0.69
Mb 22021-006	US 2 - US 141 - M 95 from E Limits of Iron Mountain W & N to N Limits of Iron Mountain	Payne & Dolan of Wisconsin, Inc.	22-69	22-14	EBOL	0.47	0.48
					EBIL	0.50	0.62
					WBOL	0.32	0.49
					WBIL	0.41	0.57
Mtb 25052-005	M 54 BR from Detroit St & 1st St N to Wager St	Spartan Asphalt Paving Co.	47-3	63-54	NBOL	0.41	0.44
					NBIL	0.40	0.45
					SBOL	0.41	0.45
					SBIL	0.41	0.46
Ms 25061-006	M 121 from I 75 E to E of Van Slyke Rd	Flint Asphalt & Paving Co.	47-3 & 32-4	63-29	EBOL	0.44	0.44
					EBIL	0.46	0.47
					WBOL	0.37	0.38
					WBIL	0.47	0.50
Mb 25071-008	M 54 from S to N Limits of Grand Blanc	Spartan Asphalt Paving Co.	63-4	63-4	NBOL	0.44	0.46
					NBIL	0.51	0.55
					SBOL	0.45	0.43
					SBIL	0.54	0.57
Mb 25091-006	M 15 from S of S Limits N to N of N Limits of Davison	Lind Asphalt Paving Co.	63-4	63-4	NBOL	----	0.50
					NBIL	0.50	0.52
					SBOL	----	0.45
					SBIL	0.46	0.47
SS 32021-005	M 142 from S Limits Pigeon E to W Limits of Elkton	Williams Bros. Asphalt Paving Co.	32-4	79-78	EB	0.50	0.59
					WB	0.50	0.62
U 33034-011	US 27 from S of Douglass St N to N of Northcrest Rd	Spartan Asphalt Paving Co.	47-3	34-15	NBOL	0.47	0.32
					NBIL	0.50	0.39
					SBOL	0.52	0.34
					SBIL	0.50	0.40
Ms 33082-019	M 43 from E of Hagadorn Rd E to GTWRR	Spartan Asphalt Paving Co.	47-3	34-15 & 33-79	EBOL	0.45	0.33
					EBIL	0.13	0.33
					WBOL	0.47	0.35
					WBIL	0.46	0.39
Mb 47061-012	I 96 BL from M 59 E to I 96	Reith-Riley Const. Co., Inc.	47-3	47-3	EBOL	0.47	0.39
					EBIL	0.52	0.47
					WBOL	0.51	0.39
					WBIL	0.54	0.46
Mb 53032-003	US 10 - US 31 from E of W Jct. US 10 - US 31 E to Reinburg Ave	Luman Asphalt & Paving Co.	67-2	67-2	EB	0.44	0.54
					WB	0.45	0.57
Mb 54011-005	US 131 from M 46 N intermittently to M 20	Reith-Riley Const. Co., Inc.	54-42 & 42-38	54-21	NB	0.38	0.46
					SB	0.40	0.52
Mb 62011-003	M 20 - M 82 from E of W intersection of M 20 - M 82 E to C & O RR	Reith-Riley Const. Co., Inc.	41-38	62-25	EB	0.36	0.63
					WB	0.37	0.63
Mb 62022-001	M 82 from M 37 E to M 20	Reith-Riley Const. Co., Inc.	41-38	62-25	EB	0.38	0.60
					WB	0.40	0.54
Mb 63031-022	US 24 from Shallowbrook St N to S of US 10	Bit Con Corp.	47-3	63-7	NBOL	0.43	0.45
					NBIL	0.42	0.51
					SBOL	0.42	0.43
					SBIL	0.47	0.51
Mb 74073-002	US 25 from Port Sanilac N to Deckerville Rd	Ann Arbor Const. Co.	63-4	74-51	NB	0.51	0.65
					SB	0.53	0.67
Mb 80111-009	M 119 from NYCRR N 2.435 miles	John G. Yerington Co.	39-1	80-20	NB	0.47	0.70
					SB	0.51	0.69
Mb 81072-005	US 23 BR - I 94 BL from Main St E to Fletcher St & from University Ave E to Toumy Rd	Ann Arbor Const. Co.	47-3	81-57	EBOL	0.48	0.37
					EBIL	0.48	0.38
					WBOL	0.52	0.36
					WBIL	0.45	0.39
U 82144-016	M 102 - M 29 from Kelly Rd E to I 94	The Cooke Contracting Co.	50-35	63-4 & 50-35	EBOL	0.54	0.43
					EB*3	0.54	0.45
					EB*2	0.60	0.50
					EBIL	0.61	0.52
					WBOL	0.51	0.53
					WB*3	0.49	0.55
					WB*2	0.54	0.55
					WBIL	0.60	0.58

TABLE 9
BITUMINOUS CONCRETE PAVEMENTS (4.12) TESTED DURING 1969 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Average Coefficient of Wet Sliding Friction	
			Coarse	Fine		1969	1973
Mb 08031-007	M 37 comm. at Calhoun-Barry Co. Line thence N'ly to Maple Grove Rd	Reith-Riley Const. Co., Inc.	39-1 & 41-38	8-58	NB SB	0.56 0.54	0.60 0.61
Mb 12022-008 (Part 1 of 2)	US 12 E of Coldwater	John G. Yerington Co.	Mat. Services Thornton, Ill	12-35	EB WB	0.52 0.55	0.38 0.37
Mb 12022-008 (Part 2 of 2)	US 27 in Coldwater	John G. Yerington Co.	Mat. Services Thornton, Ill	12-35	NBOL NBIL SBOL SBIL	0.41 0.45 0.40 0.43	0.46 0.46 0.48 0.45
U 13042-003	I 94 BL comm. at I 69 thence E to US 27 in Marshall	Reith-Riley Const. Co., Inc.	39-1	39-1	EBIL WBOL WBIL	0.45 0.43 0.53	0.42 ---- 0.42
Mb 13061-010	I 94 BL (Michigan Ave) from Elm St SE'ly to East City Limits of Battle Creek	Reith-Riley Const. Co., Inc.	39-1	13-38 & 13-79	EB WB	0.48 0.47	0.47 0.44
Mb 25052-006	M 54 BR (Saginaw St) in City of Flint, from Wager St N'ly to Carpenter Rd (N City Limits of Flint)	Flint Asphalt & Paving Co.	47-3	63-29	NBOL NBIL SBOL SBIL	0.44 0.48 0.42 0.44	0.43 0.44 0.43 0.45
Mb 25073-005	M 54 from 1916' S of Hollywood Blvd NW'ly to Pine St in village of Pine Run	Saginaw Asphalt Paving Co.	71-29	79-73	NBOL NBIL SBOL SBIL	0.51 0.60 0.54 0.60	0.50 0.60 0.40 0.54
Mb 25101-013	M 57 (State St) from 490' W of the W Village Limits of Montrose E'ly to 105' W of the E Village Limits of Montrose	Saginaw Asphalt Paving Co.	71-29	79-73	EBOL EBIL WBOL WBIL	0.56 0.47 0.48 0.45	0.46 0.40 0.46 0.48
SS 34011-004	M 91 (Reloc) comm. approx. 411' E of M 44, thence N to approx. 1230' N of Ellis Rd	Reith-Riley Const. Co., Inc.	41-38	41-106	NB SB	0.65 0.60	0.64 0.69
Mb 38082-002	I 94 BL from 1160' W of M 60 E'ly to 35' W of Brown St (W City Limits of Jackson) Also on I 94 BL from 30' E of East St in City of Jackson E'ly to W of US 127	Workman-Richardson Asphalt Co.	Maumee Stone Findlay, Ohio	46-28	EBOL EBIL WBOL WBIL	0.45 0.42 0.43 0.45	0.31 0.32 0.33 0.33
M 41051-005	M 44 comm. at 28th St thence N, City of Grand Rapids	Michigan Colprovia	41-22	41-39	NBOL NBIL SBOL SBIL	0.44 0.44 0.41 0.46	0.50 0.49 0.52 0.54
Mb 44011-005	M 24 from S of Braur Rd N'ly to 3684' S of Turrill Rd	Ayling-Cunningham Asphalt Paving Co.	63-4	63-4	NB SB	0.60 0.58	0.53 0.55
Mb 44031-003	M 53 from the Macomb-Lapeer Co. Line N'ly to 250' N of Water St in the Village of Almont	Ayling-Cunningham Asphalt Paving Co.	63-4	63-4	NB SB	0.57 0.53	0.47 0.49
Mb 62011-003	M 20 & M 82 from 1700' E of W intersection of M 20 & M 82 E'ly to 100' E of C & O RR	Reith-Riley Const. Co., Inc.	41-38	62-25	EB WB	0.59 0.55	0.63 0.63
Mb 63052-020 (Part 2 of 3)	US 10 BR (Oakland Ave) from 230' S of Clark St NW 0.956 mi	A & A Asphalt Paving Co.	63-4	63-4	NBOL NBCL NBIL	0.42 0.47 0.48	0.34 0.38 0.38
Mb 63052-020 (Part 3 of 3)	US 10 BR from 835' NW of Cass Ave & Montcalm St NW 0.950 mi	A & A Asphalt Paving Co.	63-4	63-4	NBOL NBIL SBOL SBIL	0.42 0.46 0.41 0.42	0.48 0.46 0.46 0.46
Mb 64011-008	US 131 from the Muskegon-Oceana Co. Line N'ly 2 mi	Laman Asphalt Paving Co.	67-2	67-2	NB SB	0.58 0.58	0.58 0.53
Ma 78022-008	US 12 from 0.5 mi W of White School Rd E'ly to M 66 in Sturgis	John G. Yerington Co.	39-1	12-35	EBOL EBIL WBOL WBIL	---- 0.56 ---- 0.52	0.57 0.56 0.58 0.54
M 82101-013	M 14 comm. on Hines Drive, thence E'ly to Mercedes Rd, City of Livonia	A & A Asphalt Paving Co.	47-3	63-7	EBOL EBIL WBOL WBIL	0.39 0.40 0.35 0.42	0.30 0.34 0.31 0.33
Mb 82121-011	I 96 BS (Grand River Ave) from I 94 SE to Trumbull Ave	The Cooke Contracting Co.	50-35 & 63-4	63-4	EBOL EBIL WBOL WBIL	0.48 0.52 0.49 0.49	0.29 0.35 0.26 0.35
Mb 82121-013	I 96 BS (Grand River Ave) from Freeland Ave to 190' S of Dundee Ave & from W Grand Blvd to I 94, City of Detroit	Detroit Asphalt Paving Co.	47-3	47-3	EBOL EBIL WBOL WBIL	0.42 0.45 0.41 0.45	0.47 0.49 0.44 0.50
Mb 82131-010	US 10 (Woodward Ave) from Adams St NW'ly to West Grand Blvd, City of Detroit	Ajax Asphalt Paving Inc.	E. C. Levy (Dix)	E. C. Levy (Dix)	NBOL NBCL NBIL SBOL SBCL SBIL	0.44 0.46 0.46 0.43 0.48 0.50	0.27 0.27 0.29 0.35 0.34 0.33
Mb 83021-009	M 55 from the E intersection of M 115 E'ly to Balsam St, City of Cadillac	The Hicks Co.	83-12	83-12	EB WB	0.53 0.51	0.58 0.59
Group Mm 9BA-5A (61073)	US 31 BR (Colby St) from C & O RR overpass in Whitehall N'ly to the RR tracks in Montague in the cities of Whitehall & Montague	Reith-Riley Const. Co., Inc.	75-5	70-9	NB SB	0.51 0.51	0.45 0.45

TABLE 10
BITUMINOUS AGGREGATE PAVEMENTS (4.11) TESTED DURING 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Average Coefficient of Wet Sliding Friction	
			Coarse	Fine		1968	1973
SS 01024-002	M 72 from Co. Rd #171 E to US 23	Central Paving Co.	1-6	1-6	EB WB	0.36 0.38	0.61 0.56
Mb 02021-009 (Part)	M 94 from E of Marquette-Alger Co. Line E to M 28	Fox Valley Construction Co.	2-1	2-1	EB WB	0.48 0.56	0.65 0.64
Mb 02021-009 (Part)	M 67 from US 41 N 2.833 miles	Fox Valley Construction Co.	2-1	2-1	NB SB	0.50 0.56	0.64 0.64
Mb 18022-006 (Part)	US 10 from W City Limits of Farwell W to M 115	The Hicks Company	26-28	--	EB WB	0.26 0.26	0.46 0.49
Mb 18022-006 (Part)	M 61 2 miles W of Clare-Gladwin Co. Line	The Hicks Company	26-28	--	EB WB	0.45 0.49	Not Tested
Mb 18022-006 (Part)	Intermittent Patching: M 61 from 3 miles E of M 30 E 7 miles	Central Paving Co.	65-47	--	EB WB	0.42 0.49	0.69 0.68
Mb 20032-004 (Part)	I 75 BL - M 93 from N of M 72 N 2.54 mi	Lake Construction Company & Howell Construction Company	20-36	--	NB SB	0.35 0.30	0.52 0.49
Mb 20032-004 (Part)	M 93 from Co. Rd #612 S 2.95 mi	Lake Construction Company & Howell Construction Company	20-36	--	NB SB	0.48 0.43	Not Tested
F 22012-002	M 95 from US 2 N to Co. Rd #569	Payne & Dolan of Wisconsin, Inc.	22-69	--	NB SB	0.28 0.23	0.51 0.48
Mb 24051-002	M 131 from N of US 31 N & W to Zoll St	Hodgkiss & Douma, Inc.	15-32	--	NB SB	0.32 0.27	0.45 0.44
M 27022-003	US 2 from E of Jackson Creek E intermittently to E of Slate River	Payne & Dolan of Wisconsin, Inc.	27-67	27-67	EB WB	0.54 0.50	0.61 0.63
Mb 48041-002	M 28 from Schoolcraft-Luce Co. Line E to M 123	Lake Construction Company & Howell Construction Company	48-10	48-10	EB WB	0.35 0.34	0.65 0.62
Mb 57041-001	M 42 from M 37 E to M 66	Globe Construction Co.	83-6	83-6	EB WB	0.46 0.50	0.57 0.55

TABLE 11
BITUMINOUS AGGREGATE PAVEMENTS (4.11) TESTED DURING 1969 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Average Coefficient of Wet Sliding Friction	
			Coarse	Fine		1969	1973
Mb 11074-003	M 62 from Berrien-Cass Co. Line E to M 40, W of Dowagiac	Klett Constr. Co.	23-84	23-84	EB	0.52	0.59
					WB	0.56	0.58
Mb 14051-002	M 119 from US 12 N'ly to M 60, Village of Vandalia	John G. Yerington Co.	14-57	14-57	NB	0.54	0.57
					SB	0.51	0.60
Mb 23091-003	M 99 comm. at Crawford Rd in Jackson Co., thence N'ly on M 99 to the N City Limits of Eaton Rapids	Workman-Richardson Asphalt Co.	38-73	38-73	NB	0.52	0.56
					SB	0.51	0.52
M 27022-003	US 2 from approx. 3000' SE of Jackson Creek SE'ly intermittently on existing trunkline to approx. 2300' SE of Slate River (six patches)	Payne & Dolan of Wisconsin, Inc.	27-67	27-67	EB	0.63	0.61
					WB	0.66	0.63
Mb 32051-003	M 19 from Huron Line Rd N to M 142	Ann Arbor Constr. Co.	32-11	32-11	NB	0.61	0.65
					SB	0.61	0.64
SS 60011-004	M 33 comm. approx. 1200' S of Co. Rd 612 thence N'ly to M 32	Lake Construction Company & Howell Construction Company	60-24	60-24	NB	0.53	0.67
					SB	0.52	0.66
Mb 65022-003 (Part 1 of 2)	M 55 from M 33 E approx. 6 mi to Henderson Lake Rd	Central Paving Co.	60-7	60-7	EB	0.29	0.40
					WB	0.33	0.44
Mb 65022-003 (Part 2 of 2)	M 33 and M 72 from Mio N and E to Fairview	Lake Construction Company & Howell Construction Company	60-24	60-24	NB	0.46	0.47
					SB	0.46	0.49
Mb 83021-008	M 55 from 180' W of Co. Rd 21 E'ly to W intersection of M 115	The Hicks Co.	83-12	83-12	East End of Project		
					EB	0.45	0.54
					WB	0.43	0.52
					West End of Project		
					EB	0.52	0.62
					WB	0.49	0.62

TABLE 12
MISCELLANEOUS BITUMINOUS PAVEMENTS TESTED DURING 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Average Coefficient of Wet Sliding Friction	
			Coarse	Fine		1968	1973
STONE-FILLED SAND ASPHALT							
Ms 09011-003	M 84 - I 75 BL from SW of Ziegler Rd NE to M 13	Saginaw Asphalt Paving Co.	17-40	79-73	NB SB	0.44 0.42	0.51 0.50
Mb 49023-009 (Part)	US 2 from W of Co. Rd 402 E to W of I 75	Lake Construction Company & Howell Construction Company	75-5	70-9	EB WB	0.32 0.33	0.59 0.50
Mb 49023-009 (Part)	I 75 BL from Burdette St N to Marquette St	Lake Construction Company & Howell Construction Company	75-5	70-9	NBOL NBIL SBOL SBIL	0.40 0.41 0.41 0.46	0.47 0.50 0.45 0.50
SPECIAL HOT EMULSION WEARING COURSE MIXTURE							
Mb 82052-037	US 24 from Carter Rd N to Pardee Rd	Detroit Asphalt Paving Co.	----	47-15	NBOL NBIL SBOL SBIL	0.44 0.47 0.49 0.48	0.42 0.48 0.37 0.44
BITUMINOUS NS RESURFACING							
Ms 82053-044	US 24 from Joy Rd N to W Chicago Blvd	Stolaruk Asphalt Paving, Inc.	----	47-3	NBOL NB#3 NB#2 NBIL	0.59 0.60 0.61 0.61	0.47 0.47 0.49 0.46

TABLE 13
MISCELLANEOUS BITUMINOUS PAVEMENTS TESTED DURING 1969 AND 1973

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Average Coefficient of Wet Sliding Friction	
			Coarse	Fine		1969	1973
NSST (SINGLE AND DOUBLE)							
Mm 9SC-3A (18041)	M 61 from Clare-Osceola Co. Line E 2.1 mi. Also on M 61 from Clare-Osceola Co. Line W 2.5 mi	Comstock Constr. Co.	71-15	-----	EB WB	0.43 0.37	0.43 0.49
Mm 9SC-4A (60021)	M 32 from 7.8 mi E of Montmorency-Otsego Co. Line E'ly to village of Atlanta	Gilliland Constr. Co.	71-15	71-15	EB WB	0.38 0.29	0.36 0.35
STONE FILLED SAND ASPHALT AND SIMILAR SURFACES							
Ms 70032-007	US 25 BR from 315' SW of M 29 in Marysville NE'ly to Dove St in Port Huron, Cities of Marysville and Port Huron.	Detroit Conc. Products Corp.	17-40	74-51	NBOL NBIL SBOL SBIL	0.45 0.49 0.43 0.51	0.45 0.51 0.44 0.45
Mb 79062-003	M 81 from 2138' SW of Green Rd NE'ly & E'ly to M 53, Village of Cass City.	Strausberg & Son Co.	32-4	79-78	EB WB	0.61 0.63	0.66 0.69

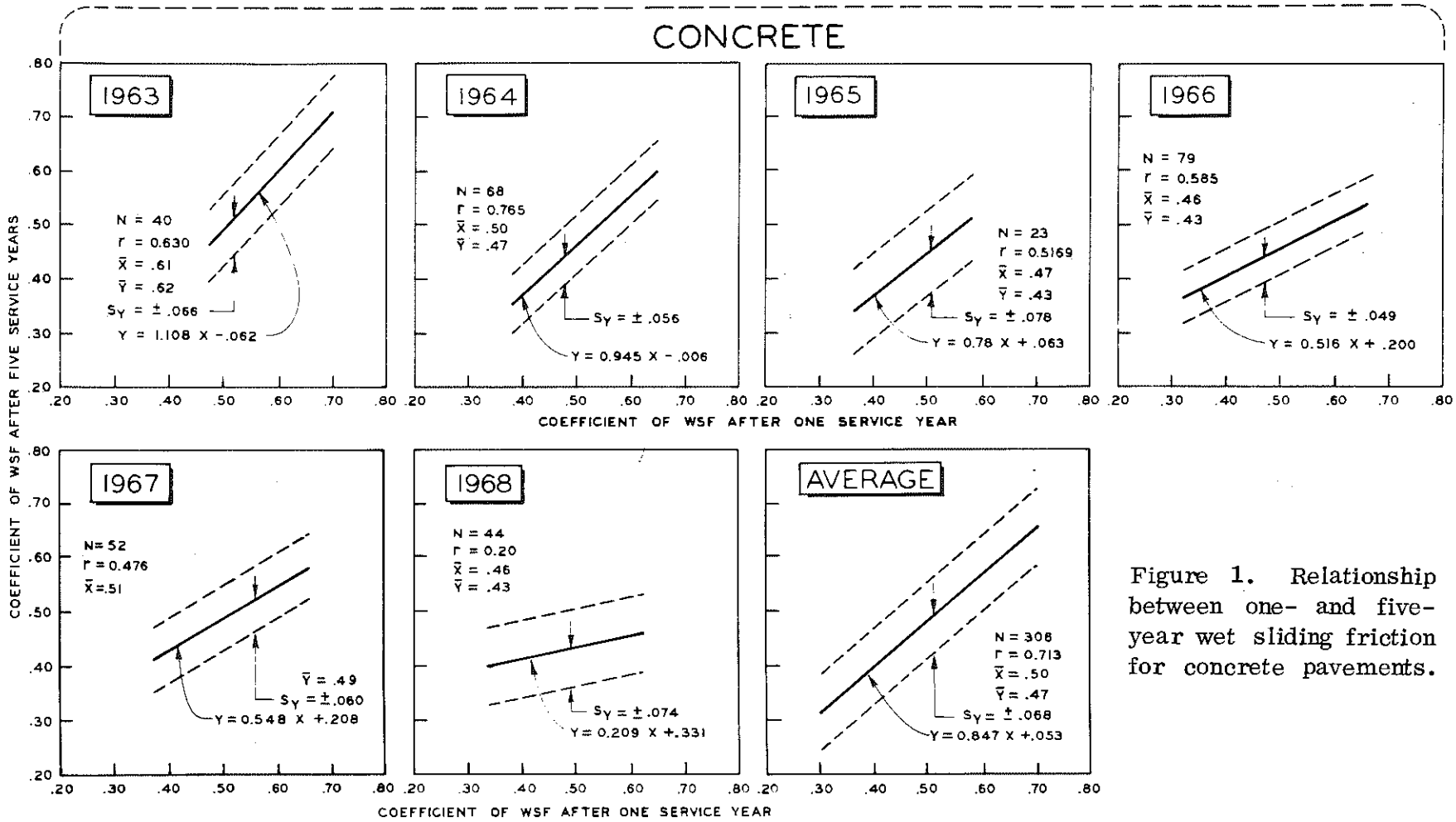


Figure 1. Relationship between one- and five-year wet sliding friction for concrete pavements.

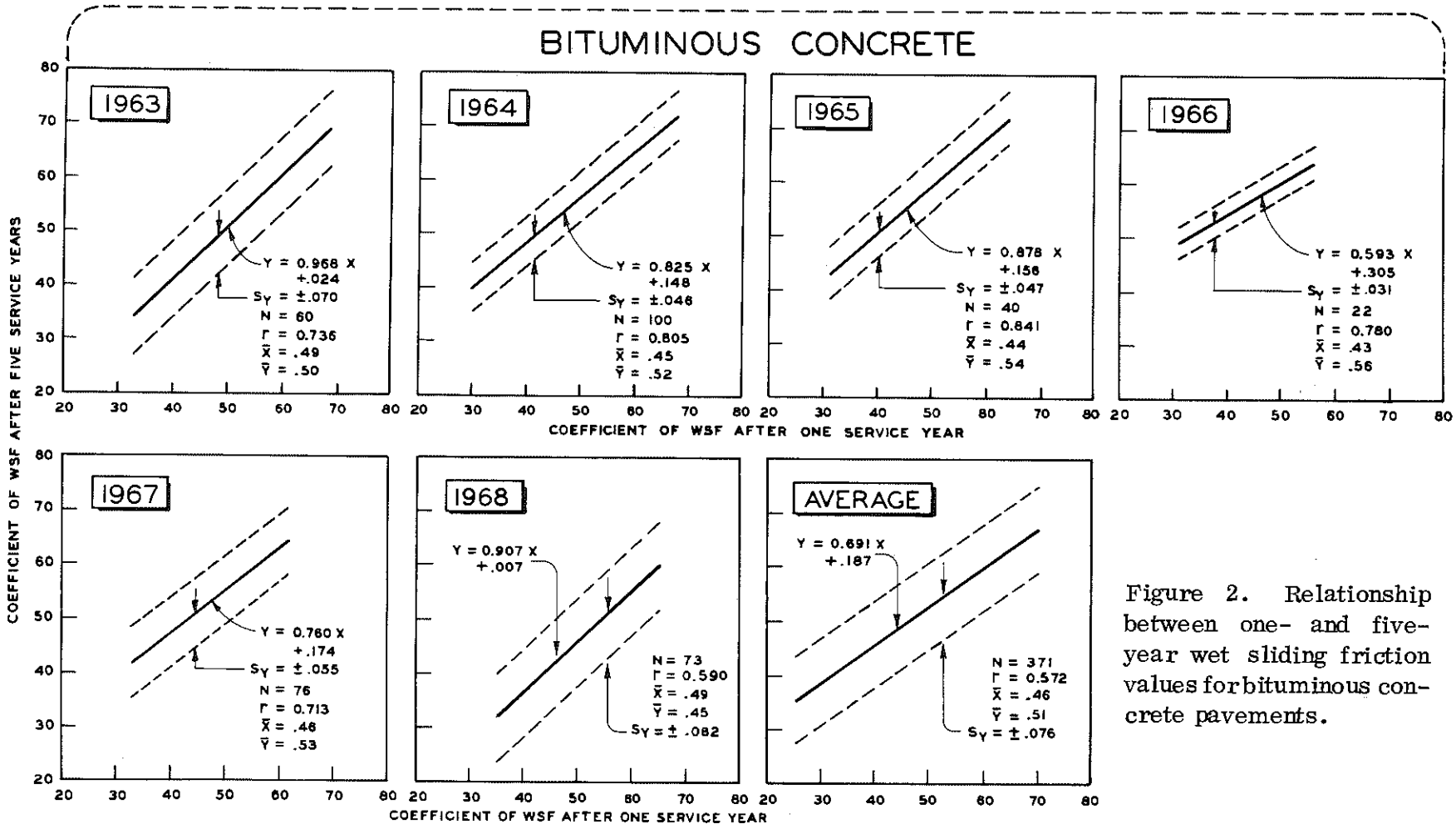


Figure 2. Relationship between one- and five-year wet sliding friction values for bituminous concrete pavements.

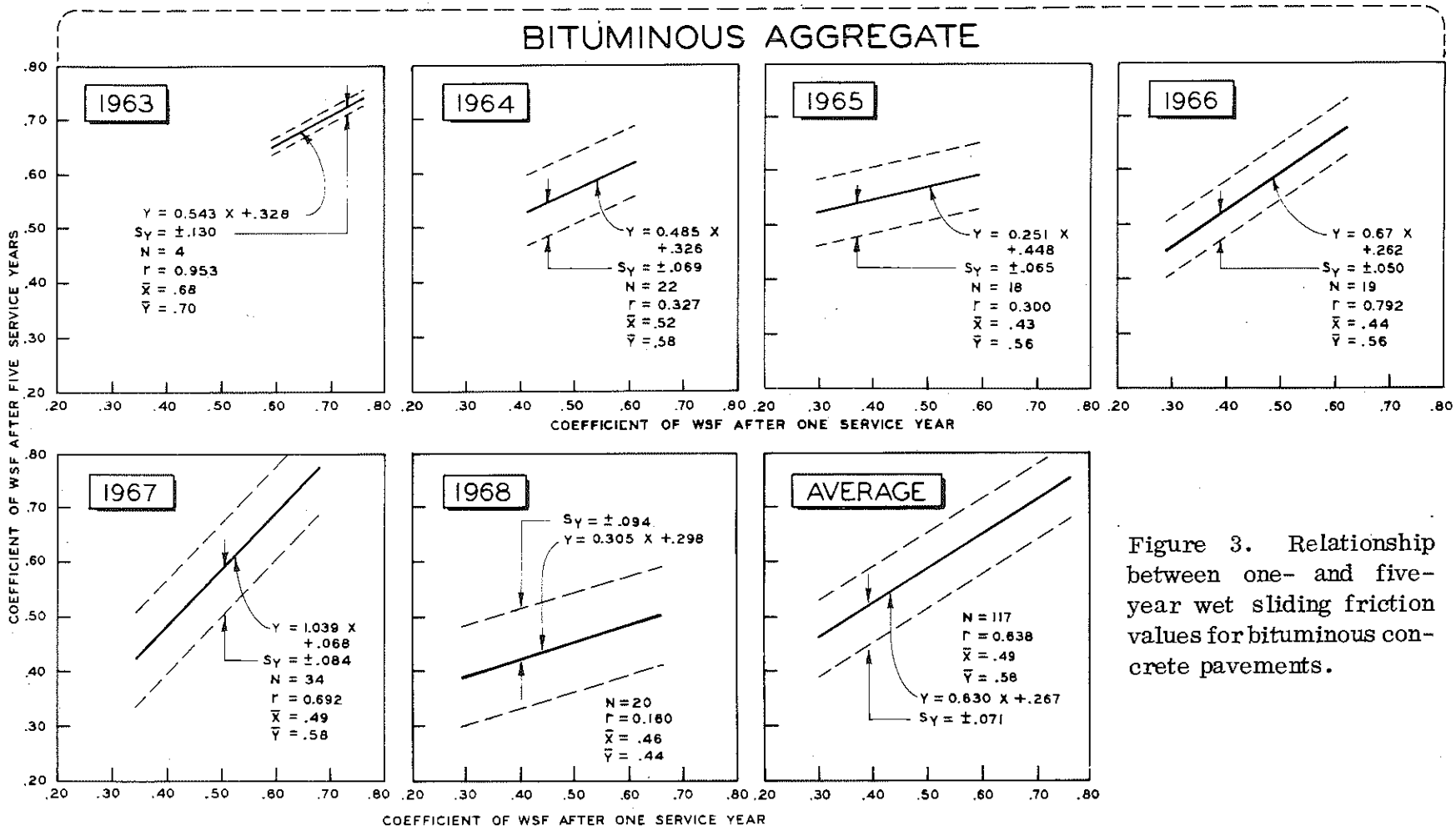


Figure 3. Relationship between one- and five-year wet sliding friction values for bituminous concrete pavements.

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 ten years of service has been made on 134 trunkline projects. Three hundred ninety-six lanes of concrete or bituminous pavement were skid tested at the ten-year service level during 1973 and results are contained in Tables 14 through 20. Twenty-nine percent of the 262 concrete lanes yielded ten-year Wsf values below 0.40. Twenty-two percent of the 123 bituminous concrete lanes had ten-year values below 0.40. Only ten bituminous aggregate lanes and two prime and double seal lanes were skid tested after a ten-year service level; none of the values were below 0.40.

TABLE 14
CONCRETE PAVEMENTS TESTED DURING 1964, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1964	1968	1973
BI 17033A, C5 RN	I 75 from Mackinac Co. Line N to N of M 48	Hodgkiss & Douma, Inc.	17-63	17-63	NBOL	0.61	0.65	0.68
					NBIL	0.65	0.71	0.79
					SBOL	0.60	0.60	0.63
					SBIL	0.60	0.69	0.76
BI 17033A, C9 RN	I 75 from N of M 48 N 1.886 mi	Hodgkiss & Douma, Inc.	17-63	17-63	NBOL	0.60	0.64	0.63
					NBIL	0.62	0.70	0.78
					SBOL	0.63	0.64	0.65
					SBIL	0.63	0.69	0.74
BI 170[illegible]E, C12	I 75 from Old US 2 N to N of M 28	Pierson Contracting Co.	17-20	17-20	NBOL	0.60	0.59	0.50
					NBIL	0.61	0.70	0.61
					SBOL	0.59	0.51	0.54
					SBIL	0.64	0.70	0.67
BI 17034A, C14	I 75 from N of M 28 N to S of Six Mile Rd	Hodgkiss & Douma, Inc.	17-20	17-20	NBOL	0.65	0.56	0.58
					NBIL	0.68	0.76	0.76
					SBOL	0.67	0.55	0.50
					SBIL	0.68	0.73	0.72
BI 17034B, C15	I 75 from S of Six Mile Rd N to S of Sault Ste. Marie	Hodgkiss & Douma, Inc.	17-20	17-20	NBOL	0.66	0.52	0.55
					NBIL	0.70	0.74	0.73
					SBOL	0.64	0.44	0.50
					SBIL	0.64	0.68	0.72
U 21031E, C3	M 35 from S limits of Escanaba NE & N to US 2 - US 41	Fox Valley Construction Co.	75-5	21-12	NBOL	0.51	0.44	0.45
					SBOL	0.56	0.54	0.45
BI 49025E, C18 RN	I 75 from S of M 123 N to N of M 134	Pierson Contracting Co.	17-63 & 49-88	17-63	NBOL	0.57	0.59	0.54
					NBIL	0.58	0.63	0.76
					SBOL	0.60	0.54	0.57
					SBIL	0.62	0.66	0.76
BI 49025H, C20 RN	I 75 from S of FAS 1052 N to Chippewa Co. Line	Hodgkiss & Douma, Inc.	17-63	17-63	NBOL	0.60	0.62	0.65
					NBIL	0.67	0.71	0.78
					SBOL	0.61	0.60	0.64
					SBIL	0.64	0.68	0.80
BI 49025G, C22 RN	I 75 from N of M 134 N to S of FAS 1052	Pierson Contracting Co.	17-63	17-63	NBOL	0.64	0.64	0.58
					NBIL	0.64	0.71	0.75
					SBOL	0.60	0.59	0.62
					SBIL	0.65	0.67	0.74
U 52042E, C8	M 28 - US 41, Marquette By-Pass	Bacco Construction Co.	52-56	52-57	EBOL	0.55	0.49	0.32
					EBIL	0.58	0.66	0.46
					WBOL	0.57	0.50	0.39
					WBIL	0.64	0.63	0.43
U 55031A, C9	M 35 from US 41 NE to N limits of Menominee	Caspian Construction Co.	55-4 & 55-115	55-4	NBOL	0.50	0.49	0.26
					SBOL	0.47	0.50	0.37

TABLE 15
CONCRETE PAVEMENTS TESTED DURING 1965, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1965	1968	1973
BI 03033B, C14	I 196 from 101st Ave N to 109th Ave	Carl Goodwin & Sons, Inc.	3-65	3-65	NBOL	0.52	0.45	0.48
					NBIL	0.63	0.59	0.64
					SBOL	0.55	0.45	0.52
					SBIL	0.62	0.62	0.68
BI 03033D, C16	I 196 from 109th Ave to N of 116th Ave	L. W. Edison	3-65	3-65	NBOL	0.55	0.53	0.58
					NBIL	0.63	0.66	0.66
					SBOL	0.55	0.51	0.58
					SBIL	0.58	0.64	0.69
BI 03034D, C11	I 196 from N of Washington Rd N to S of 61st St	Titus Construction Co.	70-9 & 75-5	3-47 & 70-9	NBOL	0.57	0.45	0.50
					NBIL	0.61	0.62	0.67
					SBOL	0.55	0.48	0.52
					SBIL	0.60	0.62	0.69
BI 03033E, C12 BI 03034A, C7	I 196 from N of 116th Ave N to S of Adams Rd	Carl Goodwin & Sons, Inc.	3-65 & 75-5	3-47 & 3-65	NBOL	0.55	0.50	0.49
					NBIL	0.62	0.66	0.65
					SBOL	0.55	0.52	0.53
					SBIL	0.62	0.65	0.62
BF 03032A, C3 BF 03032A, C4	US 31 from S of 61st St NE to N of 58th St	Titus Construction Co.	70-9 & 75-5	3-47 & 70-9	NBOL	0.53	0.50	0.49
					NBIL	0.58	0.67	0.56
					SBOL	0.51	0.46	0.50
					SBIL	0.57	0.66	0.55
F 13022C, C7	M 60 from W of Goldup St, in Homer, to E of the Kalamazoo River	Titus Construction Co.	30-35	30-35	EBOL	0.48	0.46	0.53
					WBOL	0.44	0.41	0.52
US8 33011B, C3 US8 33011D, C4	M 99 from I 96 N to N of the NYCRR	Eisenhour Const. Co., Inc.	34-49	33-79	NBOL	0.42	0.35	0.36
					SBOL	0.40	0.38	0.35
I 33045D, C1 I 33045B, C2 I 33045F, C3	I 496 from S of Cavanaugh Rd N to Mt. Hope Ave	Sargent Construction Co.	47-3	33-6	NBOL	0.49	0.39	0.33
					NBIL	0.57	0.50	0.34
					SBOL	0.42	0.34	0.32
					SBIL	0.52	0.46	0.40
BF 39014A, C12 BF 39014A, C14 BI 39024B, C15	US 131 from I 94 NW to "M" Ave	W. H. Knapp, Inc.	3-44	3-44	NBOL	0.52	0.47	0.43
					NBIL	0.65	0.59	0.55
					SBOL	0.53	0.46	0.46
					SBIL	0.55	0.56	0.55
BF 39014A, C23	US 131 from "M" Ave N 2.14 mi	W. H. Knapp, Inc.	3-44	3-44	NBOL	0.59	0.48	0.48
					NBIL	0.65	0.62	0.57
					SBOL	0.55	0.38	0.49
					SBIL	0.62	0.61	0.57
U 39041A, C5	US 31 BR (Stadium Dr) from E of US 31 NE to SW of Michigan Ave in Kalamazoo	W. H. Knapp, Inc.	3-44	3-44	EBOL	0.50	0.39	0.41
					WBOL	0.50	0.42	0.46
I 41027F, C59	I 196 from Fuller Ave E to I 96	L. W. Edison	41-46	41-46	EBOL	0.58	0.48	0.43
					EBIL	0.58	0.54	0.51
					WBOL	0.58	0.49	0.46
					WBIL	0.61	0.49	0.52
U 46061D, C6 SS 46071A, C1	M 52 from Michigan-Ohio State Line N to S limits of Adrian	Hertel-Deyo Co.	France Stone, Ohio	46-16	NBOL	0.52	0.39	0.34
					NBIL	0.47	0.40	0.32
					SBOL	0.54	0.46	0.36
					SBIL	0.44	0.37	0.28
BI 50111I, C12	I 94 from the Clinton River Spillway Bridge N to S of Joy Rd	L. A. Davidson	E. C. Levy (Dix Yd.)	50-21	NBOL	0.50	0.46	0.40
					NBCL	0.47	0.51	0.48
					NBIL	0.54	0.62	0.47
					SBOL	0.53	0.43	0.39
					SBCL	0.50	0.55	0.42
					SBIL	0.58	0.60	0.44
BI 50111J, C13	I 94 from S of Joy Rd to N of Cotton Rd	Denton Constr. Co.	50-35 & 63-4	50-35	NBOL	0.48	0.41	0.33
					NBCL	0.56	0.48	0.39
					NBIL	0.58	0.60	0.40
					SBOL	0.48	0.46	0.33
					SBCL	0.53	0.43	0.37
					SBIL	0.59	0.62	0.41
BI 50111K, C22 RN BI 50112A, C1 RN	I 94 from N of Cotton Rd NE to N of the Macomb-St Clair County Line	Sargent Constr. Co.	75-5	50-22	NBOL	0.48	0.44	0.41
					NBCL	0.54	0.51	0.46
					NBIL	0.59	0.58	0.48
					SBOL	0.47	0.46	0.37
					SBCL	0.51	0.44	0.43
					SBIL	0.58	0.59	0.50
U 56023A, C10 F 56023A, C11	M 20 (Buttles St) from US 10BR (Eastman) SE to 2nd St & on Indian St from US 10BR (Eastman) SE to 1st St, in Midland	Titus Construction Co.	75-5	37-26	SBOL	0.37	0.40	0.33
					SBCL	0.38	0.36	0.33
					SBIL	0.40	0.42	0.37
EBBU 63081D, C6	I 696 BS from E of US 24 SE to W of Lahser Rd	The Kutchins Co.	E. C. Levy (Dix Yd.)	63-7	EBOL	0.35	0.36	0.48
					EBCL	0.40	0.42	0.42
					EBIL	0.40	0.47	0.44
					WBOL	0.37	0.48	0.47
					WBCL	0.42	0.38	0.48
					WBIL	0.43	0.36	0.53

TABLE 15 (Cont.)
CONCRETE PAVEMENTS TESTED DURING 1965, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1965	1968	1973
EBBU 63081E, C4	I 696 BS from NE of Lee Baker Dr NE to NW of Lahser Rd	L. A. Davidson	47-3 & E. C. Levy (Dix Yd. & Trenton Yd.)	47-3, 63-7 & 63-48	EBOL	0.39	0.39	0.43
					EBCL	0.47	0.43	0.49
					EBIL	0.52	0.48	0.52
					WBOL	0.43	0.41	0.47
					WBCL	0.47	0.44	0.50
					WBIL	0.51	0.52	0.55
EBBU 63082A, C3	I 696 BS and Northwestern Hwy from E of 12 Mile Rd SE to E of US 24	The Kutchins Co.	E. C. Levy (Dix Yd.)	63-7	NBOL	0.46	0.44	0.49
					NB#4	0.45	0.40	0.45
					NB#3	0.43	0.39	0.50
					SB#3	0.32	0.38	0.40
					SB#2	0.46	0.47	0.44
					SBIL	0.49	0.54	0.49
BI 63101D, C8	I 696 from W of Franklin Rd SE to W of US 24	The Kutchins Co.	E. C. Levy (Dix Yd.)	63-7	EBOL	0.43	0.32	0.38
					EBIL	0.48	0.41	0.41
					WBOL	0.38	0.42	0.43
					WBIL	0.45	0.39	0.43
U 63171A, C1 BU 82193B, C9	M 39 from Cornell Ave S to Trojan Ave	Cooke Contracting Co.	47-3	47-3	NBOL	0.49	0.41	0.44
					NBCL	0.50	0.44	0.46
					NBIL	0.48	0.39	0.44
					SBOL	0.46	0.32	0.45
					SBCL	0.48	0.38	0.44
					SBIL	0.49	0.37	0.48
BI 63172A, C1	I 75 from N of Auburn Rd to S of Walton Blvd	Pierson Contr. Co.	63-4	63-4	NBOL	0.46	0.39	0.34
					NBIL	0.52	0.49	0.37
					SBOL	0.46	0.39	0.30
					SBIL	0.57	0.47	0.37
BI 63174E, C2	I 75 from W of M 150 W & N to N of 17 Mile Rd	Cooke Contracting Co.	63-4	63-4	NBOL	0.44	0.38	0.33
					NBCL	0.51	0.48	0.40
					NBIL	0.57	0.58	0.39
					SBOL	0.43	0.43	0.38
					SBCL	0.54	0.42	0.44
					SBIL	0.56	0.51	0.47
BI 63174F, C3	I 75 from S of E Long Lake Rd N & W to E of Adams Rd	Sargent Constr. Co.	63-4 & 63-9	63-4	NBOL	0.46	0.51	0.33
					NBCL	0.54	0.48	0.29
					NBIL	0.60	0.59	0.39
					SBOL	0.47	0.43	0.31
					SBCL	0.52	0.49	0.35
					SBIL	0.57	0.57	0.36
BI 63174G, C4	I 75 from E of Adams Rd W & N to Auburn Rd	Sargent Constr. Co.	63-4	63-4	NBOL	0.50	0.46	0.33
					NBCL	0.50	0.50	0.34
					NBIL	0.54	0.51	0.33
					SBOL	0.46	0.44	0.28
					SBCL	0.49	0.47	0.31
					SBIL	0.56	0.55	0.33
BI 631741, C5 BI 63174D, C14	I 75 from 11 Mile Rd N to N of 13 Mile Rd	Cooke Contracting Co.	63-4 & E. C. Levy (Dix Yd.)	50-15 & 63-4	NBOL	0.38	0.39	0.27
					NBCL	0.46	0.45	0.28
					NBIL	0.55	0.49	0.32
					SBOL	0.44	0.36	0.29
					SBCL	0.50	0.42	0.32
					SBIL	0.58	0.49	0.32
BI 631741, C6 BI 63174J, C7 BI 63174E, C8	I 75 from N of 13 Mile Rd N & W to W of M 150	Denton Constr. Co.	63-4	50-35 & 63-4	NBOL	0.44	0.38	0.34
					NBCL	0.51	0.45	0.37
					NBIL	0.58	0.51	0.39
					SBOL	0.46	0.38	0.35
					SBCL	0.52	0.47	0.37
					SBIL	0.56	0.52	0.39
U 63201A, C3 U 63201A, C4	I 75BL - US 10BR (Widetrack Dr) from Whittemore St S counter clockwise to W Huron St in Pontiac	Oak Construction Co.	63-4	63-4	OL	0.38	0.36	0.20
					#3	0.38	0.39	0.24
					#2	0.38	0.39	0.27
					IL	0.40	0.44	0.28
U 73063B, C6	M 46 from intersection of Rust and Sheridan Sts N on Sheridan to Remington St (WB); Also N on Warren St to Holland St, thence E on Holland St to Genesee St (EB) in Saginaw	W. F. McNally Co.	71-47	76-1 & 79-63	EBOL	0.38	0.35	0.32
					EBCL	0.41	0.35	0.32
					EBIL	0.39	0.39	0.33
					WBOL	0.45	0.38	-----
					WB#3	0.41	0.38	0.30
					WB#2	0.44	0.40	0.30
					WBIL	0.48	0.46	0.32
SS 77052C, C2	M 29 from Thornapple St N to N city limits of St. Clair	Anderson & Ruzzin, Inc.	75-5	50-33	NBOL	0.43	0.43	0.44
					NBIL	0.40	0.50	0.42
					SBOL	0.42	0.49	0.41
					SBIL	0.43	0.49	0.41
BI 77111A, C2	I 94 from Springboard Rd NE to St. Clair Hwy	Sargent Constr. Co.	75-5	50-22 & 50-26	NBOL	0.53	0.49	0.43
					NBIL	0.58	0.60	0.57
					SBOL	0.52	0.42	0.39
					SBIL	0.57	0.57	0.53

TABLE 15 (Cont.)
CONCRETE PAVEMENTS TESTED DURING 1965, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1965	1968	1973
BI 77111B, C3	I 94 from St. Clair Hwy NE to Big Hand Rd	Sargent Constr. Co.	75-5	50-26	NBOL	0.51	0.47	0.46
					NBIL	0.59	0.62	0.58
					SBOL	0.52	0.40	0.46
					SBIL	0.59	0.54	0.58
BI 77111D, C4	I 94 from Big Hand Rd N to existing US 25	Sargent Constr. Co.	75-5	50-26	NBOL	0.54	0.51	0.47
					NBIL	0.62	0.66	0.60
					SBOL	0.51	0.46	0.48
					SBIL	0.60	0.58	0.61
F 78022C, C2	US 12 from M 78 (W Jct.) E to E of Vinewood Ave	Cross & White	78-5 & 78-25	78-25	EBOL	0.42	0.35	0.36
					EBIL	0.43	0.37	0.36
					WBOL	0.40	0.37	0.35
					WBIL	0.39	0.38	0.37
F 79041C, C3	M 46 from Vassar Rd E to M 24	Denton Constr. Co.	32-4	79-63	EB	0.50	0.49	0.46
					WB	0.52	0.49	0.47
BI 82111A, C19 BI 82111D, C22 BI 82251A, C14 BI 82251B, C18	I 75 - I 375 from S of Jefferson Ave N to Division	L. A. Davidson	E. C. Levy (Dix Yd.)	47-3, 50-24, 63-7, & 63-48	NBOL	0.50	0.46	0.41
					NB#3	0.43	0.46	0.38
					NB#2	0.42	0.43	0.42
					NBIL	0.45	0.50	0.43
					SBOL	0.46	0.43	0.43
					SB#3	0.44	0.45	0.46
					SB#2	0.45	0.49	0.48
					SBIL	0.48	----	----
BU 82112J, C19U	I 696 Spur from N of Meyers Rd NW to N of 7 Mile Rd	Denton Constr. Co.	47-3	47-3	NBOL	0.45	0.38	0.45
					NBCL	0.47	0.41	0.45
					NBIL	0.48	0.43	0.47
					SBOL	0.46	0.40	0.45
					SBCL	0.46	0.42	0.44
					SBIL	0.47	0.43	0.46
BU 82112K, C21	I 696 Spur from N of 7 Mile Rd NW to S of Greenfield	Denton Constr. Co.	47-3	47-3	NBOL	0.46	0.37	0.45
					NBCL	0.46	0.40	0.47
					NBIL	0.48	0.41	0.49
					SBOL	0.45	0.39	0.44
					SBCL	0.48	0.44	0.46
					SBIL	0.51	0.41	0.46
BU 821121, C29U	I 696 Spur from NW of Wyoming Ave NW to NW of Meyers Rd	Ministrelli Const. Co., Inc.	E. C. Levy (Dix Yd.)	47-3 & 82-15	NBOL	0.41	0.38	0.42
					NBCL	0.42	0.42	0.47
					NBIL	0.46	0.50	0.53
					SBOL	0.43	0.36	0.44
					SBCL	0.45	0.39	0.45
					SBIL	0.45	0.45	0.51
BI 82191D, C9RN F 82271A, C2R	I 75 from S of Sibley Rd N to N of Eureka Rd	L. A. Davidson	E. C. Levy (Dix Yd. & Trenton Yd.)	82-10	NBOL	0.45	0.41	0.29
					NBCL	0.41	0.42	0.35
					NBIL	0.48	0.52	0.35
					SBOL	0.41	0.39	0.30
					SBCL	0.50	0.44	0.36
					SBIL	0.50	0.53	0.38
BU 82192G, C17	M 39 from Capitol Ave to Glendale Ave	Denton Construction Co.	47-3 & E. C. Levy (Trenton Yd.)	47-3	NBOL	0.43	0.38	0.40
					NBCL	0.47	0.41	0.40
					NBIL	0.44	0.46	0.43
					SBOL	0.44	0.37	0.38
					SBCL	0.46	0.43	0.43
					SBIL	0.43	0.40	0.49
F 82192D, C22	M 39 from S of Rotunda Dr to N of Village Rd and from N of Michigan Ave to S of Ford Rd	Louis Garavaglia Contractors Inc. & The Kutchins Co.	47-3 & E. C. Levy (Dix Yd. & Trenton Yd.)	47-3, 63-7, 82-5, & 82-10	NBOL	0.45	0.37	0.44
					NBCL	0.48	0.41	0.52
					NBIL	0.49	0.46	0.49
					SBOL	0.46	0.35	0.41
					SBCL	0.47	0.44	0.40
					SBIL	0.47	0.48	0.51
BU 82193B, C8	M 39 from N of McNichols Rd to N of Trojan Ave	Cooke Contracting Co.	47-3	47-3	NBOL	0.40	0.37	0.41
					NBCL	0.46	0.40	0.41
					NBIL	0.48	0.43	0.45
					SBOL	0.42	0.36	0.40
					SBCL	0.43	0.38	0.41
					SBIL	0.47	0.43	0.45
F 82211B, C16 F 82211P, C17	M 85 (Fort Rd) from Allen Rd NE to Sibley Rd	Cooke Contracting Co.	E. C. Levy (Trenton Yd.)	81-59 & 82-5	NBOL	0.42	0.41	0.44
					NBIL	0.46	0.56	0.43
					SBOL	0.36	0.38	0.40
					SBIL	0.43	0.53	0.47
BI 82251E, C10UN BI 82251F, C12UN	I 75 from Alexandrine to Warren	Cooke Contracting Co.	E. C. Levy (Dix Yd. & Trenton Yd.)	63-9	NBOL	0.44	0.42	0.43
					NB#3	0.44	0.47	0.41
					NB#2	0.45	0.55	0.49
					NBIL	0.48	0.59	0.49
					SBOL	0.44	0.46	0.44
					SB#3	0.44	0.48	0.46
					SB-2	0.47	0.53	0.51
					SBIL	0.49	0.68	0.53

TABLE 16
BITUMINOUS CONCRETE PAVEMENTS (4.12) TESTED DURING 1964, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1964	1968	1973
Mb 11041C, C2	M 60 from US 112 E to E limits of Niles	John G. Yerington	Material Service Corp. Thornton, Ill	11-64 & 11-35	EB WB	0.38 0.39	0.34 0.33	0.42 0.41
F 11052D, C5 F 11052C, C6	US 31 - US 33 from Ferry St NE to College Ave	John G. Yerington	Material Service Corp. Thornton, Ill	11-18	NBOL NBIL SBOL SBIL	0.42 0.50 0.42 0.42	0.34 0.35 0.38 0.36	0.38 0.38 0.39 0.42
SS 17042A, C4	M 48 (FAS 1054) from Old US 2 E to I 75	Thornton Constr. Co., Inc.	17-31	17-31	EB WB	0.59 0.56	0.54 0.53	0.56 0.61
U 21031E, C3	M 35 from S limits of Escanaba NE & N to US 2 - US 41	Payne & Dolan of Wisconsin, Inc.	75-5	21-12	NBIL SBIL	0.44 0.44	0.37 0.38	0.52 0.51
F 21031C, C4	M 35 from S limits of Escanaba SW to S of Ford River	Payne & Dolan of Wisconsin, Inc.	75-5	21-12	NB SB	0.43 0.44	0.38 0.40	0.43 0.41
F 22022A, C7	US 2 from W limits Norway E to US 8	Payne & Dolan of Wisconsin, Inc.	22-26	22-08 & 22-18	EBOL EBIL WBOL WBIL	0.48 0.54 0.53 0.60	0.65 0.71 0.50 0.68	0.72 0.56 0.49 0.64
F 22023A, C3	US 2 from US 8 E to E limits Norway	Payne & Dolan of Wisconsin, Inc.	22-26	22-08 & 22-18	EBOL EBIL WBOL WBIL	0.42 0.52 0.50 0.52	0.61 0.51 0.56 0.54	0.46 0.51 0.50 0.54
BU 27021B, C2	US 2 from Wemple St E to E limits Ironwood	Mathy Construction Co.	27-62	27-6	EBOL EBIL WBOL WBIL	0.52 0.56 0.57 0.58	0.45 0.59 0.54 0.61	0.50 0.51 0.49 0.49
BF 27021B, C3	US 2 from E limits Ironwood E to W limits Bessemer, omitting at bridge	Mathy Construction Co.	27-62	27-6	EBOL EBIL WBOL WBIL	0.50 0.51 0.56 0.66	0.54 0.64 0.50 0.60	0.53 0.63 0.58 0.66
BF 27021G, C4	US 2 from W limits Bessemer E 0.891 mi	Mathy Construction Co.	27-62	27-6	EBOL EBIL WBOL WBIL	0.50 0.61 0.56 0.60	0.53 0.52 0.42 0.53	0.56 0.68 0.51 0.65
Mb 31052A, C8	US 41 (Quincy St) from Lincoln Ave E to Reservation St	Thornton Constr. Co., Inc.	31-45	31-45	WBOL WBIL	0.41 0.44	0.44 0.44	0.49 0.46
SS 52081C, C1	M 28BR from M 35 E to W limits Ishpeming	George Hocking Const.	52-39	52-9	EB WB	0.51 0.47	0.51 0.52	0.49 0.55
USS 52081C, C2	M 28BR from W limits Ishpeming E to W of Washington St	George Hocking Const.	52-39	52-9	EB WB	0.45 0.47	0.50 0.50	0.47 0.50
F 55031C, C8	M 35 from N limits Menominee N 4.583 mi	Payne & Dolan of Wisconsin, Inc.	55-4	55-4	NB SB	0.45 0.54	0.51 0.53	0.47 0.48
U 55031A, C9	M 35 from US 41 NE to N limits of Menominee	Payne & Dolan of Wisconsin, Inc.	55-4	55-4	NBIL SBIL	0.42 0.42	0.46 0.50	0.52 0.54
BI 80012A, C1	I 196 from Berrien Co. line N to N of 30th Ave	Globe Construction Co.	17-40	80-20 & 11-37	NBOL NBIL SBOL SBIL	0.46 0.61 0.49 0.69	0.49 0.68 0.52 0.74	0.57 0.77 0.65 0.79
BI 80012B, C3	I 196 from N of Brandywine Creek N to C&O RR	Saginaw Asphalt Paving Co.	75-5	Local Pit	NBOL NBIL SBOL SBIL	0.46 0.61 0.45 0.60	0.46 0.69 0.45 0.67	0.46 0.69 0.53 0.69
SS 80072B, C7	M 40 from Michigan Ave N to N of N limit of Paw Paw	John G. Yerington	Material Service Corp. Chicago, Ill	80-20	NBOL NBIL SBOL SBIL	0.42 0.48 0.54 0.46	0.43 0.47 0.47 0.45	0.41 0.43 0.46 0.39

TABLE 17
BITUMINOUS CONCRETE PAVEMENTS (4.12) TESTED DURING 1965, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1965	1968	1973
Mb 03072C, C4	M 40 from US 31 SE in Holland	West Shore Constr. Co.	75-5	70-27	NB SB	0.38 0.34	0.39 0.38	0.41 0.42
F 07012C, C3	US 41 from old US 41 S and SE	Thornton Constr. Co., Inc.	7-22	7-22	NB SB	0.51 0.50	0.51 0.49	0.58 0.52
F 07023C, C1	M 28 from W of the Marquette-Baraga Co. line W to W of DSSA RR	Thornton Constr. Co., Inc.	7-22	7-22	EB WB	0.64 0.65	0.53 0.54	0.60 0.60
USS 08012C, C10	M 43 (Broadway) from Thorn St to State Rd in Hastings	Rieth-Riley Constr. Co., Inc.	41-22	8-58	NBOL NBIL SBOL SBIL	0.42 0.39 0.44 0.40	0.44 0.46 0.48 0.46	0.36 0.31 0.39 0.32
F 08032C, C10	M 37 from S of 4th St in Middleville SE and E to M 43	Rieth-Riley Constr. Co., Inc.	41-22	8-58	NWB SEB	0.51 0.51	0.49 0.52	0.58 0.56
Mb 09032C, C8 Mb 09033C, C5	M 13 from N of Wilder Rd N and NW to US 23	Midland Contracting Co.	17-40	63-4	NBOL NBIL SBOL SBIL	0.36 0.43 0.38 0.46	0.46 0.50 0.42 0.48	0.35 0.35 0.31 0.33
F 13022C, C7 F 13022C, C8	M 60 from 17 Mile Rd E to E of the Kalamazoo River in Homer	Rieth-Riley Constr. Co., Inc.	12-35	Material Service Corp, Thornton Illinois	EB WB	0.47 0.46	0.43 0.46	0.56 0.54
M 16032C, C4	M 27 from Seymour St NE to US 23 in Cheboygan	Central Paving Co.	71-15	71-15	NBIL SBIL	0.32 0.29	0.51 0.49	0.28 0.28
F 22023B, C4	US 2 from E limits of Norway E to the Sturgeon River	Payne & Dolan of Wisconsin, Inc.	22-26	22-18	EB WB	0.58 0.54	0.59 0.54	0.51 0.56
USS 33011B, C3 USS 33011D, C4	M 99 from I 96 N to N of NYCRR	Spartan Asphalt Paving Co.	47-3	33-6	NBIL SBIL	0.42 0.43	0.53 0.49	0.45 0.46

TABLE 17 (Cont.)

BITUMINOUS CONCRETE PAVEMENTS (4.12) TESTED DURING 1965, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1965	1968	1973
SS 33091C, C5 SS 38141C, C1 SS 81011C, C4	M 52 from 1.2 mi SE of Boyce Rd N and NW to M 106	Spartan Asphalt Paving Co.	47-3	47-3	NB SB	0.58 0.55	0.61 0.58	0.63 0.59
F 37021C, C2	M 20 from Gilmore Rd E to Mt. Pleasant	The Hicks Co.	37-26	37-26	EB WB	0.49 0.39	0.50 0.55	0.53 0.54
U 39041A, C5	US 31BR (Stadium Dr) NE from E of US 31 to SW of Michigan Ave in Kalamazoo	Globe Construction Co.	Material Service Corp, Thornton, Illinois	39-1	EBIL WBIL	0.56 0.54	0.62 0.61	0.52 0.51
Mb 41013C, C11	US 131 from Cedar St. in Cedar Springs NE to Montcalm-Kent Co. Line	Rieth-Riley Constr. Co., Inc.	41-22	54-25	NB SB	0.38 0.37	0.48 0.51	0.50 0.55
Fb 61024C, C1	M 37 from M 46 E to Casnovia,	Paul C. Miller	17-40	70-4	EB WB	0.33 0.31	0.35 0.36	0.28 0.33
F 44031C, C1	M 53 from Main St in Almont N to M 21 in Imlay City	Frank Strausberg & Son Co.	63-4	63-4	NB SB	0.50 0.46	0.52 0.52	0.45 0.35
F 45071C, C4	M 22 from S of Cedar Creek N 4.654 miles	Peninsula Asphalt & Constr. Co.	45-13	45-13	NB SB	0.35 0.38	0.36 0.39	0.42 0.42
F 46101A, C3	US 12 from Mill Race River E and NE to E limits of Clinton	Ayling-Cunningham Asphalt Paving Co.	Maumee Stone Co. Maumee, Ohio	46-16	EBOL EBIL WBOL WBIL	0.42 0.39 0.46 0.44	0.39 0.41 0.42 0.42	0.50 0.42 0.52 0.45
U 50011A, C6	M 53 from Wayne-Macomb Co. line N to N limits of Warren, omitting that portion within limits of Centerline	Cooke Contracting Co.	63-4	82-5	NBOL NBCL NBIL SBOL SBCL SBIL	0.33 0.34 0.36 0.36 0.35 0.35	0.33 0.36 0.39 0.33 0.35 0.36	0.30 0.31 0.31 0.32 0.31 0.33

TABLE 17 (Cont.)
BITUMINOUS CONCRETE PAVEMENTS (4.12) TESTED DURING 1965, 1968, and 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1965	1968	1973
F 50091C, C1	M 19 from Pound Rd N to S limits of Memphis	Cooke Contracting Co.	63-4	50-26	NB	0.47	0.48	0.47
					SB	0.46	0.51	0.46
F 56023A, C11	US 10BR - M 20 (Indian St) from Jerome St SE to First St in Midland	Midland Contracting Co.	17-40	63-54	NBOL	0.32	0.35	0.42
					NBCL	0.34	0.39	0.37
					NBIL	0.33	0.37	0.42
BF 61075B, C1	US 31 from M 20 N to N of Burpee Rd	Spartan Asphalt Paving Co.	17-40 & 75-5	70-9	NBOL	0.45	0.47	0.51
					NBIL	0.61	0.63	0.66
					SBOL	0.45	0.44	0.47
					SBIL	0.61	0.58	0.64
BF 61075D, C4	US 31 from N of Burpee Rd NW to existing US 31 at Colby Rd	Spartan Asphalt Paving Co.	17-40	61-9	NBOL	0.44	0.45	0.57
					NBIL	0.64	0.66	0.77
					SBOL	0.40	0.42	0.49
					SBIL	0.60	0.60	0.76
F 78022A, C1	US 12 from US 131 E to E of E limits of White Pigeon	Rieth-Riley Constr. Co., Inc.	Material Service Corp, Thornton, Illinois	Stone Lake, Indiana	EBOL	0.42	0.40	0.40
					EBIL	0.35	0.42	0.35
					WBOL	0.47	0.39	0.44
					WBIL	0.37	0.41	0.35
F 81031C, C3	US 12 from SW of Mills St to NE of Saline	Washtenaw Asphalt Co.	47-3	81-1	EBOL	0.46	0.49	0.38
					EBIL	0.43	0.48	0.41
					WBOL	0.48	0.52	0.42
					WBIL	0.41	0.47	0.46

TABLE 18
BITUMINOUS AGGREGATE PAVEMENTS (4.11) TESTED DURING 1964, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1964	1968	1973
SS 10011C, C2	M 22 from Manistee Co. Line N to M 115	Klett Construction Co.	10-25	10-25	NB SB	0.62 0.59	0.65 0.66	0.49 0.50
M 17043A, C2	M 48 from M 129 E to Goetzville	Thorton Constr. Co., Inc.	17-51	17-51	EB WB	0.75 0.76	0.75 0.73	0.70 0.78

TABLE 19
BITUMINOUS AGGREGATE PAVEMENTS (4.11) TESTED DURING 1965, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1965	1968	1973
F 20021C, C1	M 72 from the Kalkaska-Crawford Co. Line SE to I 75BL in Grayling	The Hicks Co.	20-39	----	EB WB	0.50 0.51	0.52 0.54	0.43 0.49
FFH 64022B, C1	M 82 relocation from 1 mi S of existing M 82 E to the Newaygo-Oceana Co. Line in Hesperia	Spartan Asphalt Paving Co.	64-35	----	EB WB	0.58 0.56	0.61 0.60	0.71 0.73
F 66031B, C3 F 66032C, C8	US 45 from 4.9 mi S of M 28 N to M 28	Mathy Construction Co.	66-33	----	NB SB	0.64 0.63	0.60 0.56	0.57 0.51

TABLE 20
PRIME AND DOUBLE SEAL PAVEMENT TESTED DURING 1964, 1968 AND 1973

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		1964	1968	1973
Mm 31031, C2	M 203 from N of Anthony St NW to Powder Rd	Thorton Constr. Co., Inc.	31-45	----	NB SB	0.53 0.56	0.60 0.56	0.51 0.54

SECTION IV

EXPERIMENTAL FEATURES IN PAVEMENT SURFACES

Table 21 - Rubberized Sand-Asphalt; US 31, City of Charlevoix

Except for 1962, skid tests have been conducted annually on the Rubberized Sand-Asphalt surface which was placed on US 31 in October 1960. Table 21 summarizes the history of these tests. After 13 service years, this pavement continues to possess an average friction level above 0.40. The current level is 0.41, 0.06 lower than the 1972 value.

Table 22 - 3 BC Sand-Asphalt Resurfacing, US 131, North and South of Alba (Project Mm 4 BC-3A, Control Section 05072)

Good skid resistance qualities continue with the 1973 tests on this nine-year old 3 BC Sand-Asphalt surface. Although coefficients average slightly higher on the 150/175 penetration sand-asphalt using 6.4 percent bitumen, no significant difference in friction level performance is indicated over the 85/100 penetration sand-asphalt using 6.9 percent bitumen. Since US 131 was returned to a two-lane roadway in 1968, however, coefficients on the former inside lanes have gradually decayed to the point of matching those on the former outside lanes. A marked difference was noticeable before 1968.

Table 23 - Bituminous Concrete Interstate Projects

Table 23 presents the results of skid tests taken on a representative sample of interstate bituminous concrete projects which were constructed in 1961 and 1962. Particular attention has been given to differences in performance between inside (passing) and outside (traffic) lanes during the past 12 years of this study. The 1973 tests yielded friction levels ranging from 0.42 to 0.66 and averaging 0.55 in the outside lanes, and friction levels ranging from 0.56 to 0.76 and averaging 0.67 in the inside lanes. Previously established trends continued this year, as the inside lanes yield an average friction level 22 percent higher than the outside lanes. All values are above the 0.40 mark.

Table 24 - Bridge Deck Surface Coatings

Table 24 summarizes the skid test history for six types of bridge deck surface coatings on 37 structures. Added to the study during 1973 was a Latex concrete surfacing mix.

1. Rubberized Bituminous Concrete

During 1967 and 1968, ten bridges were coated with rubberized bituminous concrete. Since then, annual skid tests have been conducted on these structures. In 1973, the average friction level was 0.45, 0.07 lower than the average determined last year and indicating a reverse in a four-year trend of Wsf values increasing with age.

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 six-year service period, both lanes continue to exhibit good skid resistance qualities with coefficients averaging 0.54.

3. Polyurethane Coatings

S18 of 82025 had a special thin coating of polyurethane applied to its deck in 1968. The outside lanes continue to exhibit good friction levels while the inside lanes are all but completely worn off. Inside lane coefficients determined this year are not deemed representative of the polyurethane coating.

4. Epoxy Coatings

After four service years, skid tests revealed average friction levels of 0.41 and 0.47 on the north and south halves of the Crietz Rd bridge deck over I 496. An E-15 Versamid 140 coating was used on the north half; the south half of the deck was surfaced with Guard-Kote 250. A significant difference in friction level performance cannot be determined with the 1973 tests.

After two complete service years, an epoxy mortar coating on Crietz Rd over I 496 (S04 of 33083) has three of its five deck lanes yielding coefficients below 0.40. Contrasting with this structure, however, M 83 over the Cass River in Frankenmuth (B02 of 73131) possesses an average friction level of 0.54 or higher on all of its epoxy mortar lanes after four service years.

5. 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 ten-

sile strength of the resulting surfacing mix. Coefficients of Wsf ranged from 0.23 to 0.53 and averaged 0.36 after a two-year service period. Seventy-four percent of the lanes tested (36 of 46) had friction levels below 0.40; 13 percent (6 of 46) had 0.30 or lower.

6. Latex Concrete

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

Results of skid tests conducted on nine structures after a one-year service period are reported for the first time this year. Coefficients ranged from 0.27 to 0.53 and averaged 0.39 on the 34 lanes tested. Sixty-two percent of the lanes yielded average friction levels below 0.40; 15 percent were 0.30 or lower.

Table 25 - Experimental Skid Resistant Resurfacing

Skid tests were continued this year at 12 experimental skid resistant resurfacing locations which were constructed in 1965. After eight years of service, 17 percent of the 67 lanes tested yielded Wsf values averaging 0.50 or higher; 58 percent were between 0.40 and 0.49; the remaining 25 percent were lower than 0.40. The overall 1973 average was 0.47.

An 80-lb crushed fine aggregate surface applied in 1968 to the northbound lanes of US 24 between Joy Rd and West Chicago was tested again this year. After a five-year service period, average Wsf values range from 0.46 to 0.48 and average 0.47.

Table 26 - Textured Concrete Pavement Surfaces on Northbound I 69 (Project I 13074-001)

After a three-year service period, skid tests have been conducted again on the northbound I 69 textured concrete pavement surface and resulting Wsf values are shown in Table 26.

Friction levels have shown a steady decay over the past three service years. Effects of traffic are apparent as the more heavily traveled outside lane exhibits 1973 values ranging from 0.33 to 0.37 and averaging 0.34 while the inside lane yields coefficients ranging from 0.52 to 0.63 and averaging 0.56.

Table 27 - 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 Pere Marquette River. Gussasphalt was also used to resurface the deck of B2 of 64013 (US 31 over north branch of the Pentwater River). After one service year, both surfaces continue to have desirable Wsf values even though they have decreased since the 1972 tests.

Immediately north of the 500-ft Gussasphalt surface, a 500-ft section of Mastiphalt was also placed on the US 31 roadway. Initial skid test results were adequate, but not impressive. Wsf values have increased during 1973 to a May 1973 friction level average of 0.57.

Table 28 - Spray Grip Surface, Research Project 72 NM-326

A spray grip surface was initially placed at the intersection of US 24 (Telegraph Rd) and 10 Mile Rd in the fall of 1972. Excellent initial friction levels averaging 0.78 were determined. However, in 1973, due to a bonding problem, the initial surface was replaced. The "new" spray grip surface was first tested in October 1973. Excellent results were again found. This time Wsf values ranged from 0.73 to 0.87 and averaged 0.81.

Tables 29 and 30 - 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. November 1973 Wsf values ranged from 0.52 to 0.80 and averaged 0.68.

Project Mm 2 SC-7A (M 43 in Hastings) also had Lakelite incorporated into its mix design. November 1973 skid tests yielded coefficients ranging from 0.56 to 0.70 and averaging 0.66.

Both aforementioned test areas continue to exhibit a desirable friction level after a one-year service period.

TABLE 21
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	----
1963	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

* Initial tests on polished portland cement surface.

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

TABLE 22
3 BC SAND-ASPHALT RESURFACING, US 131, NORTH AND SOUTH OF ALBA
(Project Mm 4 BC-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
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
				SBIL/NB*	0.68	0.66	0.68	0.62	0.65	0.63	0.59	0.60	0.59	0.59	0.55
N of Alba to M32	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
				SBIL/NB*	0.63	0.68	0.68	0.64	0.67	0.62	0.60	0.60	0.60	0.60	0.61

* 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 23
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
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
						OL	0.51[2]	----	----	----	0.47	0.48	0.41	0.42	0.46	0.53	0.44	0.51	0.52	0.46
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
						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
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
						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
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
						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
		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
						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
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
						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
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
						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

[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 24
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
B01 of 09042	I 75 BL over Saginaw River in Bay City	1967	Rubberized bituminous concrete	EBOL	----	0.45	0.49	0.44	0.47	0.48	1
				EBIL	----	0.50	0.56	0.51	0.47	0.53	1
				WBOL	0.48	0.43	0.41	0.44	0.44	0.41	1
				WBIL	0.51	0.49	0.54	0.48	0.49	0.51	1
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
				SB	0.43	0.36	0.43	0.37	0.36	0.44	0.28
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
				NBIL	0.56	0.50	0.55	0.52	0.55	0.57	0.49
				SBOL	0.53	0.48	0.51	0.49	0.50	0.54	0.50
				SBIL	0.60	0.56	0.57	0.56	0.61	0.61	0.51
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
				SB	0.50	0.48	0.55	0.53	0.55	0.59	0.62
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
				NBIL	----	0.48	0.53	0.50	0.55	0.56	0.53
				SBOL	----	0.44	0.49	0.46	0.48	0.49	0.45
				SBIL	----	0.44	0.52	0.49	0.49	0.52	0.49
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
				SBIL	----	0.44	0.55	0.50	0.53	0.58	0.52
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
				NBIL	----	0.45	0.54	0.53	0.52	0.58	0.52
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
				EBCL	----	0.43	0.49	0.49	0.52	0.53	0.50
				EBIL	----	0.45	0.54	0.50	0.54	0.55	0.53
				WBOL	----	0.42	0.48	0.43	0.49	0.50	0.43
				WBCL	----	0.43	0.49	0.47	0.54	0.54	0.47
				WBIL	----	0.50	0.55	0.50	0.57	0.55	0.54
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
				EBCL	----	0.44	0.43	0.40	0.43	0.44	0.28
				EBIL	----	0.43	0.41	0.41	0.43	0.48	0.33
				WBOL	----	0.49	0.49	0.47	0.46	0.48	0.33
				WBCL	----	0.42	0.39	0.40	0.42	0.39	0.28
				WBIL	----	0.43	0.41	0.41	0.44	0.50	0.35

[1] Not Tested (experimental surface being replaced).

TABLE 24 (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
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
				EBCL	----	0.44	0.37	0.34	0.39	0.42	0.40
				EBIL	----	0.45	0.40	0.36	0.38	0.45	0.43
				WBOL	----	0.50	0.43	0.40	0.44	0.48	0.40
				WBCL	----	0.44	0.37	0.36	0.40	0.41	0.40
				WBIL	----	0.44	0.39	0.35	0.39	0.43	0.43
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	(2)
				WB	0.47	0.50	0.51	0.52	0.49	0.57	(2)
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
				NBOL	0.58	0.53	0.57	0.56	0.66	0.62	0.51
				NBIL	0.60	0.56	0.66	0.62	0.68	0.68	0.56
		1967	Rubberized bituminous concrete plus sand asphalt	SBRL	0.61	0.50	0.57	0.54	0.64	0.59	0.48
				SBOL	0.59	0.55	0.64	0.59	0.69	0.64	0.52
				SBIL	0.58	0.58	0.64	0.62	0.73	0.72	0.56
S18 of 82025	Allard Ave over I 94	1968	Special thin polyurethane coating	EBOL	----	0.46	0.42	0.52	0.54	0.55	0.48
				EBIL	----	0.40	0.16	0.34	0.26	0.26	0.18(3)
				WBOL	----	0.55	0.45	0.54	0.53	0.59	0.51
				WBIL	----	0.44	0.20	0.35	0.26	0.25	0.24
				WBIL	----	----	----	----	----	----	0.37(4)
S05 of 23081	Crietz 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(5)
				SB	----	----	0.66	0.54	0.44	0.39	0.44(5)
			South half of deck only Guard Kote 250	NB	----	----	0.75	0.52	0.46	0.50	0.45(5)
				SB	----	----	0.69	0.49	0.36	0.49	0.49(5)
S04 of 33083	I 96 over Cedar St - Penn Ave. Access Rd	1971	Epoxy Mortar	EBRL	----	----	----	----	0.68	0.48	0.36
				EBOL	----	----	----	----	0.63	0.39	0.47
				EBIL	----	----	----	----	0.68	0.46	0.47
				WBOL	----	----	----	----	0.63	0.31	0.38
				WBIL	----	----	----	----	0.57	0.47	0.29
B02 of 73131	M 83 over Cass River, Frankenmuth	Aug 1969	Epoxy Mortar	NBOL	----	----	----	0.57	0.57	0.60	0.58
				NBIL	----	----	----	0.52	0.58	0.58	0.54
				SBOL	----	----	----	0.60	0.63	0.66	0.57
				SBIL	----	----	----	0.56	0.60	0.60	0.56

(2)Not Tested (approaches turn-up).
(3)Polyurethane rolling up under tires.
(4)Tested on bare deck.
(5)Average of two test series.

TABLE 24 (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
S26 of 82195	John R over I 75	1969	Latex Modified Mortar	SBOL	----	----	----	----	----	0.60	0.53
				SB#3	----	----	----	----	----	0.53	0.47
				SB#2	----	----	----	----	----	0.47	0.47
				SBIL	----	----	----	----	----	0.48	0.39
S27 of 82195	Brush St over I 75	1969	Latex Modified Mortar	NBOL	----	----	----	----	----	0.54	0.48
				NBCL	----	----	----	----	----	0.48	0.43
				NBIL	----	----	----	----	----	0.51	0.44
S03 of 82022	WB I 94 over Wayne Rd	1970	Latex Modified Mortar	WBOL	----	----	----	----	----	0.44	0.41
				WBCL	----	----	----	----	----	0.44	0.30
				WBIL	----	----	----	----	----	0.42	0.30
X01 of 82022	EB I 94 over Shook Rd and RR	1970	Latex Modified Mortar	EBOL	----	----	----	----	----	0.41	0.32
				EBCL	----	----	----	----	----	0.44	0.35
				EBIL	----	----	----	----	----	0.46	0.38
X02 of 82022	WB I 94 over Shook Rd and RR	1970	Latex Modified Mortar	WBOL	----	----	----	----	----	0.43	(6)
				WBCL	----	----	----	----	----	0.42	0.29
				WBIL	----	----	----	----	----	0.54	0.31
S04 of 41026	M 37 over EB I 96	1971	Latex Modified Mortar	NBOL	----	----	----	----	----	0.42	0.40
				NBIL	----	----	----	----	----	0.46	0.41
				SBOL	----	----	----	----	----	0.37	0.35
				SBIL	----	----	----	----	----	0.41	0.38
				SBRL	----	----	----	----	----	0.40	0.34
S05 of 41026	M 37 over WB I 96	1971	Latex Modified Mortar	NBOL	----	----	----	----	----	0.42	0.40
				NBIL	----	----	----	----	----	0.44	0.39
				SBOL	----	----	----	----	----	0.33	0.34
				SBIL	----	----	----	----	----	0.47	0.40
				SBRL	----	----	----	----	----	0.46	0.39
S02 of 63022	I 96 over Milford Rd	1971	Latex Modified Mortar	EBOL	----	----	----	----	----	0.32	0.24
				EBCL	----	----	----	----	----	0.42	0.30
				EBIL	----	----	----	----	----	0.43	0.31
				WBOL	----	----	----	----	----	0.38	0.23
				WBCL	----	----	----	----	----	0.43	0.31
				WBIL	----	----	----	----	----	0.49	0.34

(6) Barricaded and unable to test.

TABLE 24 (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
S06 of 82022	WB I 94 over Middlebelt Rd	1971	Latex Modified Mortar	WBOL	----	----	----	----	----	0.38	0.31
				WBCL	----	----	----	----	----	0.40	0.34
				WBIL	----	----	----	----	----	0.42	0.35
S01 of 63022	I 96 over Kent Lake Rd	1972	Latex Modified Mortar	EBOL	----	----	----	----	----	0.50	0.33
				EBCL	----	----	----	----	----	0.45	0.34
				EBIL	----	----	----	----	----	0.53	0.41
				WBOL	----	----	----	----	----	0.46	0.35
				WBCL	----	----	----	----	----	0.48	0.34
				WBIL	----	----	----	----	----	0.52	0.39
S09 of 82022	EB I 94 over Ecorse Rd	1972	Latex Modified Mortar	EBOL	----	----	----	----	----	0.44	0.35
				EBCL	----	----	----	----	----	0.42	0.39
				EBIL	----	----	----	----	----	0.45	0.38
S12 of 82022	WB I 94 over Beech-Daly Rd	1972	Latex Modified Mortar	WBOL	----	----	----	----	----	0.46	0.33
				WBCL	----	----	----	----	----	0.47	0.37
				WBIL	----	----	----	----	----	0.43	0.37
S06 of 25031	Grand Blanc Rd over US 23	1972	Latex Concrete	EB	----	----	----	----	----	----	0.27
				WB	----	----	----	----	----	----	0.33
S02 of 25133	Baldwin Rd over I 75 (1.2 mi NW of Oakland County Line)	1972	Latex Concrete	EB	----	----	----	----	----	----	0.47
				WB	----	----	----	----	----	----	0.51
S09 of 25131	Fenton Rd over I 75 (2.4 mi SE of US 23)	1972	Latex Concrete	NBOL	----	----	----	----	----	----	0.35
				NBIL	----	----	----	----	----	----	0.39
				SBOL	----	----	----	----	----	----	0.35
				SBIL	----	----	----	----	----	----	0.38
S01 of 63082	US 24 over SE US 10	1972	Latex Concrete	SBOL	----	----	----	----	----	----	0.33
				SBIL	----	----	----	----	----	----	0.34
B02 of 73062	M 46 over Tittabawassee River	1972	Latex Concrete	EBOL	----	----	----	----	----	----	0.27
				EBIL	----	----	----	----	----	----	0.30
				WBOL	----	----	----	----	----	----	0.27
				WBIL	----	----	----	----	----	----	0.32

TABLE 24 (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
S02 of 82022	EB I 94 over Wayne Rd	1972	Latex Concrete	EBOL	----	----	----	----	----	----	0.30
				EBCL	----	----	----	----	----	----	0.33
				EBIL	----	----	----	----	----	----	0.38
X01 of 82024	I 94 over DeQuindre Yard	1972	Latex Concrete	EBOL	----	----	----	----	----	----	0.39
				EBCL	----	----	----	----	----	----	0.38
				EBIL	----	----	----	----	----	----	0.44
				WBOL	----	----	----	----	----	----	0.41
				WBCL	----	----	----	----	----	----	0.40
				WBIL	----	----	----	----	----	----	0.43
S01 of 82091	Old M 39 over Gate 10 entrance to Ford Plant	1972	Latex Concrete	NBOL	----	----	----	----	----	----	0.40
				NB#3	----	----	----	----	----	----	0.42
				NB#2	----	----	----	----	----	----	0.47
				NBIL	----	----	----	----	----	----	0.53
				SBOL	----	----	----	----	----	----	0.43
				SB#3	----	----	----	----	----	----	0.41
				SB#2	----	----	----	----	----	----	0.48
				SBIL	----	----	----	----	----	----	0.52
B03 of 82191	I 75 over Goddard Rd	1972	Latex Concrete	NBOL	----	----	----	----	----	----	0.40
				NBCL	----	----	----	----	----	----	0.37
				NBIL	----	----	----	----	----	----	0.40
			Concrete	SBOL	----	----	----	----	----	----	0.31
				SBCL	----	----	----	----	----	----	0.35
				SBIL	----	----	----	----	----	----	0.34

TABLE 25
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
							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
				M 13	NBIL	0.72	0.52	0.46	0.57	0.59	0.60	0.58	0.59	0.64	0.60
				M 13	SBOL	0.73	0.49	0.45	0.54	0.54	0.53	0.55	0.51	0.55	0.50
				M 13	SBIL	0.74	0.58	0.49	0.62	0.63	0.63	0.58	0.59	0.56	0.60
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
				M 13	NBIL	0.76	0.61	0.56	0.66	0.62	0.66	0.67	0.66	0.66	0.64
				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
				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
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
				M 25	WB	0.74	0.54	0.47	0.53	0.55	0.66	0.60	0.57	0.58	0.51
25072	M 54 at Coldwater Rd, N of Flint	Oct. 1965	50-lb Quartzite + asphalt	M 54	NBOL	0.67	0.50	0.51	0.55	0.54	0.54	0.54	0.57	0.53[4]	0.48[5]
				M 54	NBIL	0.77	0.54	0.52	0.61	0.62	0.61	0.63	0.66	0.69[4]	0.56[5]
				M 54	SBOL	0.70	0.51	0.51	0.55	0.57	0.58	0.53	0.49	0.45[4]	0.30[5]
				M 54	SBIL	0.76	0.53	0.53	0.60	0.60	0.63	0.62	0.64	0.64[4]	0.50[5]
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]
				M 54BR	NBIL	0.71	0.53	0.47	0.55	0.58	0.61	0.59	0.64	0.66	0.67
				M 54BR	SBOL	0.65	0.50	0.44	0.52	0.55	[2]	0.54	0.60	0.63	0.56[4]
				M 54BR	SBIL	0.71	0.52	0.49	0.58	0.61	[2]	0.61	0.66	0.69	0.66
				M 57	EB	0.70	0.51	0.45	0.56	0.56	0.55	[3]	----	----	----
				M 57	WB	0.72	0.53	0.48	0.55	0.56	0.57	[3]	----	----	----
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
				M 54	NBIL	0.66	0.47	0.41	0.44	0.45	0.52	0.49	0.52	0.53	0.52
				M 54BR	SBOL	0.62	0.47	0.46	0.40	0.44	0.48	0.38	0.45	0.44	0.45
				M 54BR	SBIL	0.66	0.47	0.41	0.41	0.48	0.54	0.48	0.54	0.52	0.53
				M 54 (Dort)	WBOL	0.62	0.45	0.45	0.46	0.50	0.54	0.52	0.61	0.54	0.49
				M 54 (Dort)	WBIL	0.62	0.45	0.47	0.48	0.52	0.55	0.50	0.56	0.51	0.46
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
				US 12	WB	0.62	0.47	0.45	0.49	0.55	0.52	0.50	0.47	0.53	0.38
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
				US 12	WB	0.60	0.49	0.47	0.54	0.54	0.57	0.55	0.51	0.54	0.38
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
				US 24	NB#3	0.53	0.36	0.34	0.41	0.40	0.41	0.38	0.37	0.42	0.39
				US 24	NB#2	0.57	0.36	0.34	0.40	0.41	0.43	0.41	0.37	0.43	0.37
				US 24	NBIL	0.60	*	*	*	*	*	*	*	*	*
				US 24	SBOL	0.52	0.38	0.37	0.41	0.39	0.43	0.38	0.40	0.46	0.44
				US 24	SBCL	0.60	0.37	0.35	0.42	0.42	0.43	0.40	0.42	0.48	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
				Five Mile Rd	EBOL	0.51	0.37	0.31	0.36	0.38	0.37	0.37	0.38	0.43	0.38
				Five Mile Rd	EBIL	0.55	0.39	0.33	0.41	0.40	0.42	0.41	0.39	0.49	0.37
				Five Mile Rd	WBOL	0.55	0.37	0.33	0.39	0.40	0.44	0.41	0.39	0.49	0.37
				Five Mile Rd	WBIL	0.60	0.39	0.33	0.43	0.44	0.44	0.42	0.42	0.49	0.37

* Not tested
[1] Bituminous Concrete - non-experimental
[2] Work being done at intersection--SB too dirty to test
[3] Deleted by new construction
[4] Pad worn off in wheel tracks
[5] Pad completely worn off

TABLE 25 (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
							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
				US 24	NB#3	0.59	0.37	0.36	0.41	0.43	0.45	0.42	0.47	0.48	0.47
				US 24	NB#2	0.62	0.40	0.36	0.44	0.47	0.48	0.51	0.51	0.57	0.47
				US 24	NBIL	0.62	0.40	0.38	0.45	0.45	0.46	0.55	0.51	0.51	0.46
				US 24	SBOL	0.60	0.37	0.35	0.42	0.40	0.44	0.40	0.44	0.48	0.46
				US 24	SB#3	0.62	0.39	0.35	0.43	0.43	0.46	0.42	0.45	0.47	0.43
				US 24	SB#2	0.61	0.39	0.36	0.45	0.47	0.46	0.46	0.48	0.54	0.45
				US 24	SBIL	0.64	0.42	0.37	0.50	0.52	0.46	0.59	0.51	0.57	0.55
				Plymouth Rd	EBOL	0.62	0.40	0.36	0.41	0.41	0.46	0.48	0.45	0.45	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
				Plymouth Rd	EBIL	0.64	0.39	0.37	0.41	0.44	0.44	0.51	0.48	0.51	0.47
				Plymouth Rd	WBOL	0.63	0.40	0.38	0.46	0.47	0.46	0.49	0.49	0.53	0.48
				Plymouth Rd	WBCL	0.61	0.41	0.37	0.44	0.44	0.46	0.45	0.42	0.50	0.48
				Plymouth Rd	WBIL	0.60	0.40	0.38	0.46	0.48	0.45	0.53	0.49	0.58	0.46
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
				US 24	NB#3	0.58	0.40	0.37	0.43	0.45	0.46	0.43	0.44	0.49	0.45
				US 24	NB#2	0.61	0.41	0.36	0.43	0.47	0.46	0.45	0.47	0.52	0.46
				US 24	NBIL	0.62	0.40	0.37	0.42	0.49	0.46	0.45	0.46	0.52	0.46
				US 24	NBLT	0.62	*	*	*	*	*	*	*	*	
				US 24	SBOL	0.56	0.42	0.41	0.44	0.41	0.45	0.42	0.44	0.50	0.42
				US 24	SBCL	0.57	0.41	0.40	0.43	0.46	0.45	0.44	0.44	0.48	0.42
				US 24	SBIL	0.59	0.41	0.40	0.43	0.47	0.46	0.43	0.47	0.50	0.46
				W. Chicago Rd	EBRT	0.63	0.45	0.44	0.48	0.50	0.45	0.45	0.51	0.56	0.42
				W. Chicago Rd	EBIL	0.63	0.44	0.40	0.42	0.46	0.45	0.45	0.47	0.54	0.42
				W. Chicago Rd	WBRT	0.63	0.43	0.41	0.47	0.50	0.46	0.48	0.46	0.52	(3)
				W. Chicago Rd	WBIL	0.63	0.41	0.37	0.47	0.47	0.45	0.45	0.48	0.51	(3)
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
				US 24	NBIL	0.52	0.42	0.38	0.47	0.47	0.50	0.48	0.49	0.48	0.51
				US 24	SBOL	0.51	0.43	0.39	0.46	0.47	0.52	0.50	0.47	0.48	0.51
				US 24	SBIL	0.51	0.42	0.38	0.46	0.46	0.50	0.48	0.50	0.48	0.49
				Sibley Rd	EB	0.54	0.39	0.36	0.42	0.43	0.45	0.48[6]	0.47	0.44	0.47
				Sibley Rd	WB	0.52	0.41	0.39	0.45	0.44	0.44	0.43	0.49	0.43	0.48
11031	M 139 NB at Empire Rd, Benton Harbor	Oct. 1965	80-lb 3NS (P-4) + Synopal + asphalt	M 139	NBOL	0.44	0.40	0.39	0.56	0.42	0.45	0.45	0.48	0.48	(3)
				M 139	NBIL	0.50	0.42	0.38	0.51	0.52	0.52	0.55	0.61	0.61	(3)
11031	M 139 SB at Empire Rd, Benton Harbor	Oct. 1965	80-lb 3NS (P-4) + asphalt	M 139	SBOL	0.45	0.38	0.40	0.51	0.43	0.47	0.46	0.50	0.48	(3)
				M 139	SBIL	0.48	0.44	0.41	0.52	0.51	0.50	0.52	0.57	0.59	(3)
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
				US 24	NB#3	----	----	----	----	0.60	0.48	0.41	0.42	0.48	0.48
				US 24	NB#2	----	----	----	----	0.61	0.46	0.42	0.44	0.50	0.48
				US 24	NBIL	----	----	----	----	0.61	0.45	0.42	0.46	0.49	0.46

[6] Tested slightly out of wheel track because of gravel graded onto pavement

TABLE 26
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
Conventional Burlap	2232+00 to 2238+00	NBOL	0.61	0.51	0.47	0.35
		NBIL	0.65	0.63	0.61	0.52
Longitudinal Brooming	2242+00 to 2248+00	NBOL	0.69	0.56	0.49	0.33
		NBIL	0.72	0.68	0.65	0.52
Transverse Combing	2253+00 to 2259+00	NBOL	0.86	0.70	0.60	0.37
		NBIL	0.87	0.86	0.78	0.63
Transverse Brooming	2272+00 to 2278+00	NBOL	0.76	0.56	0.48	0.33
		NBIL	0.79	0.74	0.72	0.58

TABLE 27
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		
		Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
Gussasphalt (C.S. 53031)	NB	0.76	0.82	0.78	--	--	--	0.57	0.62	0.60	0.60	0.61	0.61	--	--	--
	SB	0.79	0.83	0.81	--	--	--	0.63	0.68	0.66	0.55	0.59	0.58	--	--	--
Mastiphalt (C.S. 53031)	NB	0.37	0.50	0.44	--	--	--	0.48	0.49	0.48	0.56	0.58	0.57	--	--	--
	SB	0.37	0.49	0.42	--	--	--	0.54	0.56	0.55	0.55	0.60	0.57	--	--	--
Gussasphalt (B2 of 64013)	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
	SB	--	--	--	Not Completed			0.63	0.66	0.64	0.58	0.63	0.60	0.45	0.50	0.48

TABLE 28
SPRAY GRIP SURFACE
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		
		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
	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
	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
	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
	SPIL	0.34	0.37	0.36	0.78	0.79	0.79	0.64	0.69	0.66	0.82	0.83	0.83
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

TABLE 29
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		
					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
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
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
4	290+95 to 292+30	9.5	100% 31A	NB	0.92	0.94	0.93	0.76	0.83	0.79	Resurfaced		
5	292+30 to 294+20	10.0	100% 31A	NB	0.88	0.90	0.89	0.82	0.86	0.84			
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
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
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
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
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
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
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
	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
	239+75 South	---	None	SB	0.49	0.50	0.50						

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

TABLE 30
M 43 LAKELITE AGGREGATE SECTION
(Project Mm 2 SC-7A, Control Section 08012)

Location	Surface	Lane	Coefficient of Wsf								
			9-6-72			5-30-73			11-14-73		
			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
		SB	0.57	0.60	0.59	0.62	0.62	0.62	0.58	0.61	0.60
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
		SB	0.90	0.91	0.91	0.78	0.85	0.82	0.56	0.70	0.67
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
		SB	0.58	0.60	0.59	0.63	0.68	0.66	0.57	0.59	0.58

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 1972 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 1973, skid tests were conducted on 59 major highway routes. Testing was dispersed throughout all nine districts, 46 counties, and 222 separate locations, Table 31 summarizes the high-accident skid tests.

TABLE 31
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

	Control Section	Location and Mileage	1972 Accidents Total	1972 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
DISTRICT 1	**Dickenson County**								
	22011	M 95 from 0.65 to 0.77 (Breen Ave 0.78) City of Kingsford	5	80	NB	Conc	0.45	0.47	0.46
					SB		0.42	0.46	0.44
	22011	M 95 from 1.65 to 1.85 (Woodward, 1.75) City of Kingsford	11	36	NBOL	Bit	0.57	0.59	0.58
					NBIL		0.39	0.41	0.40
					SB		0.52	0.55	0.53
	22021	US 2 from 3.16 to 3.36 (Main, 3.35) City of Iron Mountain	5	60	EBOL	Bit	0.52	0.54	0.53
					EBIL		0.49	0.53	0.51
					WBOL		0.48	0.53	0.51
					WBIL		0.54	0.55	0.55
	22021	US 2 from 4.05 to 4.30 (Jct. M 95, 4.09; East "A" St, 4.21) City of Iron Mountain	16	25	EBOL	Bit	0.52	0.55	0.53
					EBIL		0.55	0.55	0.55
					WBOL		0.47	0.51	0.49
					WBIL		0.52	0.55	0.53
	Ontonagon County								
	66042	US 45 from 13.22 to 13.41 (E. River and Steel, 13.29) Village of Ontonagon	18	39	NB	Bit	0.32	0.36	0.34
					SB		0.30	0.34	0.32
DISTRICT 2	**Alger County**								
	02041	M 28 from 26.0 to 26.2 (Hickory St, 26.18) City of Munising	15	40	EBOL	Conc	0.33	0.36	0.35
					EBIL		0.36	0.38	0.37
					WBOL		0.34	0.39	0.36
					WBIL		0.35	0.38	0.37
	Chippewa County								
	17032	I 75 BS from 2.95 to 3.15 (Easterday, 2.98) City of Sault Ste. Marie	62	19	NBRT	Bit	0.49	0.51	0.50
					NBIL		0.37	0.42	0.39
					SBOL		0.45	0.48	0.47
					SBIL		0.43	0.46	0.44
	Delta County								
	21022	US 2 - US 41 - M 35 from 0.22 to 0.42 (3rd Ave, 0.24) City of Escanaba	19	26	EBOL	Conc	0.30	0.33	0.31
					EBIL		0.41	0.42	0.41
					EBIL	Bit	0.37	0.42	0.39
					WBOL	Conc	0.34	0.38	0.36
					WBIL		0.38	0.41	0.39
					WBIL	Bit	0.37	0.39	0.38
	21022	US 2 - US 41 - M 35 from 0.44 to 0.64 (6th Ave, 0.56) City of Escanaba	28	36	EBOL	Conc	0.36	0.38	0.37
					EBIL	Bit	0.42	0.46	0.44
					WBOL	Conc	0.28	0.34	0.31
					WBIL	Bit	0.39	0.44	0.42
	21022	US 2 - US 41 - M 35 from 1.72 to 1.89 (Danforth Cutoff, 1.74) City of Escanaba	15	20	EBOL	Bit	0.33	0.36	0.34
					EBIL		0.46	0.51	0.48
					WBOL		0.48	0.48	0.48
					WBIL		0.46	0.51	0.49
	Mackinac County								
	49023	US 2 from 1.56 to 1.59 (Cut River, 1.57) Moran Township	11	36					
					On Bridge Deck				
					EB	Conc	0.15	0.22	0.18
					WB		0.17	0.19	0.18
					Bridge Approaches				
					EB	Bit	0.46	0.53	0.50
					WB		0.49	0.49	0.49
	86000	I 75 at the approaches to the toll booth (4.22)	13	15					
					South of Toll Gates				
					NBOL	Conc	0.44	0.47	0.46
					NBCL		0.35	0.37	0.36
					NBIL		0.45	0.47	0.46
					North of Toll Gates				
					SBOL	Conc	0.44	0.46	0.45
					SBCL		0.35	0.40	0.38
					SBIL		0.39	0.44	0.42

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 3

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Charlevoix County								
15012	US 31 from 0.45 to 0.56 (Park, 0.45; River, 0.56) City of Charlevoix	10	50	NBOL	Bit	0.30	0.34	0.33
				NBIL		0.27	0.30	0.29
				SB		0.25	0.34	0.31
15071	M 75 from 12.10 to 12.30 (Jenson Rd, 12.20) Melrose Township	5	80	NB	Bit	0.45	0.47	0.46
				SB		0.47	0.53	0.50
Clare County								
18011	M 115 from 12.94 to 13.14 (Surrey Rd, 13.04) Surrey Township	10	40	EB	Bit	0.34	0.39	0.36
				WB		0.34	0.37	0.36
18011	M 115 from 13.22 to 13.31 (Jct. US 10, 13.32) Surrey Township	11	45	EB	Bit	0.31	0.35	0.33
				WB		0.28	0.35	0.32
18031	US 27 BR from 0.04 to 0.24 (Fifth St, 0.34) City of Clare	9	44	NBOL	Bit	0.32	0.35	0.34
				NBIL		0.32	0.35	0.34
				SBOL		0.33	0.34	0.34
				SBIL		0.32	0.37	0.35
18031	US 27 BR from 0.78 to 0.97 (Schoolcrest, 0.78; Begin Transition, 0.97) City of Clare	12	25	NBOL	Bit	0.30	0.35	0.33
				NBCL		0.24	0.25	0.24
				NBIL		0.23	0.24	0.23
				SBOL		0.41	0.46	0.43
				SBCL		0.31	0.35	0.33
				SBIL		0.21	0.23	0.22
Grand Traverse County								
28012	US 31 - M 37 from 6.03 to 6.22 (11th St, 6.04) City of Traverse City	13	31	NBOL	Conc	0.38	0.41	0.39
				NBIL		0.37	0.41	0.39
				SBOL		0.37	0.38	0.37
				SBIL		0.35	0.37	0.36
28012	US 31 - M 37 from 6.30 to 6.47 (6th St, 6.44) City of Traverse City	25	24	NBOL	Conc	0.38	0.41	0.40
				NBIL		0.36	0.38	0.37
				SBOL		0.35	0.37	0.36
				SBIL		0.34	0.38	0.37
28012	US 31 - M 37 from 4.71 to 4.87 (the Curve near Franke Rd, 4.61) Garfield Township	8	50	NB	Bit	0.39	0.40	0.40
				SB		0.34	0.38	0.36
28013	US 31 - M 37 - M 72 from 1.67 to 1.87 (Peninsula Dr, 1.68) City of Traverse City	36	28	NBOL	Conc	0.38	0.42	0.40
				NBIL		0.39	0.41	0.40
				SBOL		0.38	0.39	0.38
				SBIL		0.38	0.43	0.41
28013	US 31 - M 37 - M 72 from 1.94 to 2.14 (E. Jct. M 37, 2.00) City of Traverse City	47	32	NBOL	Bit	0.34	0.39	0.37
				NBIL		0.37	0.47	0.41
				SBOL		0.30	0.33	0.31
				SBIL		0.34	0.39	0.36
28013	US 31 - M 37 - M 72 from 2.82 to 2.95 (8th St, 2.94) City of Traverse City	32	33	NBOL	Conc	0.31	0.33	0.32
				NBIL		0.28	0.34	0.31
				SBOL		0.21	0.27	0.24
				SBIL		0.30	0.33	0.31
Leelanau County								
45071	M 22 from 14.91 to 15.10 (Carter Rd, 14.91) Village of Grielickville	10	30	NB	Conc	0.37	0.38	0.38
				SB		0.37	0.38	0.38
Manistee County								
51011	US 31 from 4.35 to 4.54 (Ninth St, 4.38) City of Manistee	21	43	NBOL	Conc	0.36	0.41	0.39
				NBIL		0.40	0.41	0.41
				SBOL		0.44	0.46	0.45
				SBIL		0.32	0.33	0.32
51011	US 31 from 4.56 to 4.76 (Fifth St, 4.68) City of Manistee	15	33	NBOL	Conc	0.37	0.40	0.38
				NBIL		0.37	0.40	0.39
				SBOL		0.36	0.40	0.38
				SBIL		0.36	0.38	0.37

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 3 CONT.

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Manistee County (Cont.)								
51011	US 31 from 4.77 to 4.96 (Second St, 4.88) City of Manistee	27	22	NBOL	Conc	0.33	0.39	0.36
				NBIL		0.41	0.41	0.41
				SBOL		0.33	0.35	0.34
				SBIL		0.34	0.36	0.35
51011	US 31 from 5.00 to 5.20 (River St, 5.20) City of Manistee	21	24	NBOL	Conc	0.33	0.35	0.34
				NBIL		0.35	0.39	0.37
				SBOL		0.30	0.32	0.31
				SBIL		0.33	0.38	0.36
51011	US 31 from 5.21 to 5.38 (Fifth and Cleveland, 5.34) City of Manistee	17	24	NBOL	Bit	0.32	0.41	0.36
				NBIL		0.27	0.31	0.29
				SBOL		0.31	0.35	0.33
				SBIL		0.30	0.32	0.31
51011	US 31 from 5.46 to 5.59 (Van Buren, 5.52) City of Manistee	10	30	NBOL	Conc	0.36	0.37	0.37
				NBIL		0.30	0.35	0.33
				SBOL		0.35	0.35	0.35
				SBIL		0.34	0.37	0.35
51011	US 31 from 6.52 to 6.72 (Bowerman Rd, 6.73) Manistee Township	5	80	NB	Conc	0.34	0.38	0.36
				SB		0.34	0.34	0.34
Mason County								
53031	US 31 from 5.86 to 6.06 (Chauvez Rd, 5.96) Pere Marquette Township	12	25	NB	Bit	0.40	0.42	0.41
				SB		0.37	0.40	0.38
53031	US 31 from 9.31 to 9.40 (First St, 9.37) Pere Marquette Township	9	44	NB	Bit	0.29	0.31	0.30
				SB		0.27	0.31	0.29
Osceola County								
67011	US 131 from 4.07 to 4.27 (Todd Ave, 4.07; Upton Ave, 4.23) City of Reed City	26	31	NBOL	Bit	0.41	0.46	0.44
				NBIL		0.39	0.44	0.42
				SBOL		0.41	0.42	0.41
				SBIL		0.41	0.44	0.43
67022	US 10 from 11.35 to 11.55 Approximately 1 mile west of Evart in Evart Township	13	31	EB	Bit	0.58	0.62	0.60
				WB		0.50	0.55	0.53
Wexford County								
83022	M 55 from 0.01 to 0.21 (N. Jct. US 131, 0.00) City of Cadillac	12	25	EB	Bit	0.42	0.45	0.44
				WB		0.45	0.48	0.46
83031	US 131 from 6.43 to 6.57 (Jct. M 55, 6.59) City of Cadillac	18	39	NBOL	Bit	0.44	0.47	0.45
				NBIL		0.42	0.44	0.43
				SBOL		0.44	0.45	0.44
				SBIL		0.43	0.47	0.45
83032	US 131 from 0.42 to 0.60 (River St, 0.60) City of Cadillac	23	26	NBOL	Bit	0.24	0.29	0.27
				NBIL		0.29	0.31	0.30
				SBOL		0.27	0.31	0.29
				SBIL		0.25	0.30	0.28
83032	US 131 from 0.63 to 0.81 (Simmons, 0.74) City of Cadillac	12	25	NBOL	Bit	0.44	0.48	0.45
				NBIL		0.44	0.48	0.46
				SBOL		0.47	0.49	0.48
				SBIL		0.45	0.49	0.47
83032	US 131 from 1.10 to 1.30 (Thirteenth St, 1.29) City of Cadillac	18	39	NBOL	Bit	0.47	0.50	0.48
				NBOL	Conc	0.36	0.38	0.37
				NBIL	Bit	0.44	0.48	0.46
				SBOL		0.46	0.48	0.47
				SBOL	Conc	0.35	0.36	0.36
				SBIL	Bit	0.45	0.49	0.47

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 4

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Alpena County								
04031	US 23 from 14.21 to 14.36 (Parson St, 14.25) City of Alpena	9	44	NB	Bit	0.38	0.41	0.40
				SB		0.37	0.44	0.42
04032	US 23 from 0.50 to 0.69 (7th Ave, 0.50; 9th Ave, 0.70) City of Alpena	11	27	NB	Bit	0.43	0.46	0.44
				SB		0.41	0.43	0.42
04032	US 23 from 0.72 to 0.92 (12th Ave, 0.92) City of Alpena	25	32	NB	Bit	0.43	0.47	0.45
				SB		0.40	0.42	0.41
04032	US 23 from 1.86 to 2.01 (Princeton Ave, 1.95) City of Alpena	12	25	NBOL	Conc	0.20	0.21	0.20
				NBIL	Bit	0.33	0.34	0.34
				SBOL	Conc	0.21	0.21	0.21
				SBIL	Bit	0.32	0.35	0.34
Cheboygan County								
16032	M 27 from 15.67 to 15.86 (Lincoln St, 15.77) City of Cheboygan	14	37	NB	Bit	0.31	0.34	0.33
				SB		0.27	0.32	0.30
16032	M 27 from 16.38 to 16.55 (Pine St, 16.45) City of Cheboygan	17	29	NB	Bit	0.28	0.30	0.29
				SB		0.27	0.31	0.29
Emmet County								
24011	US 31 - M 68 from 6.31 to 6.51 (Jct. US 131, 6.36) City of Petoskey	18	33	NBOL	Bit	0.32	0.35	0.34
				NBIL		0.31	0.34	0.32
				SBOL		0.31	0.35	0.33
				SBIL		0.34	0.34	0.34
24011	US 31 - M 68 from 6.74 to 6.91 (Ingalls St, 6.77) City of Petoskey	12	33	NBOL	Bit	0.35	0.38	0.36
				NBIL		0.34	0.36	0.35
				SBOL		0.34	0.36	0.35
				SBIL		0.37	0.38	0.37
24051	M 131 from 7.12 to 7.32 (Harrison St, 7.22) City of Harbor Springs	14	29	EB	Bit	0.31	0.33	0.32
				WB		0.28	0.31	0.30
Iosco County								
35031	US 23 from 8.02 to 8.22 (First St, 8.20) City of Tawas City	14	50	NBOL	Bit	0.43	0.48	0.45
				NBIL		0.39	0.44	0.41
				SB		0.37	0.39	0.38
35032	US 23 from 0.79 to 0.98 (Church St, 0.90) City of East Tawas	15	26	NBOL	Bit	0.47	0.50	0.48
				NBIL		0.46	0.49	0.48
				SBOL		0.36	0.43	0.39
				SBIL		0.42	0.48	0.45
35032	US 23 from 16.49 to 16.58 (Old M 171, Skeels Rd, 16.50) Oscoda Township	8	62	NB	Bit	0.28	0.33	0.31
				SB		0.38	0.38	0.38
35032	US 23 from 16.75 to 16.94 (No Logged Reference) Oscoda Township	13	46	NB	Bit	0.38	0.39	0.38
				SB		0.36	0.39	0.37
35032	US 23 from 16.96 to 17.12 (Elk Lane, 17.58) Oscoda Township	16	23	NB	Bit	0.40	0.41	0.41
				SB		0.39	0.43	0.42
Ogemaw County								
65052	M 33 from 9.92 to 10.12 (Page Ave, 10.06) City of Rose City	7	57	NB	Bit	0.34	0.37	0.36
				SB		0.28	0.31	0.30
Presque Isle County								
71091	US 23 BR from 2.75 to 2.95 (Jct. M 68, 2.92) City of Rogers City	12	33	NB	Bit	0.37	0.41	0.40
				SB		0.41	0.41	0.41

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 5

Control Section	Location and Mileage	1972 Accidents Total	1972 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
Clinton County								
19031	US 27 from 15.49 to 15.61 (Sturgis St, 15.60) City of St. Johns	34	44	NBOL	Conc	0.30	0.33	0.31
				NBIL		0.29	0.32	0.30
				SBOL		0.33	0.36	0.34
				SBIL		0.33	0.36	0.35
Isabella County								
37011	US 27 BR from 3.13 to 3.33 (Bellows, 3.34) City of Mt. Pleasant	21	57	NBOL	Bit	0.45	0.48	0.47
				NBIL		0.51	0.52	0.51
				SBOL		0.45	0.47	0.46
				SBIL		0.48	0.52	0.50
37011	US 27 BR from 3.34 to 3.54 (High, 3.59) City of Mt. Pleasant	49	37	NBOL	Conc	0.35	0.37	0.36
				NBIL		0.36	0.38	0.37
				SBOL		0.36	0.36	0.36
				SBIL		0.38	0.38	0.38
37012	US 27 BR from 0.41 to 0.61 (Broadway, 0.61) City of Mt. Pleasant	29	48	NBOL	Conc	0.35	0.36	0.35
				NBIL		0.36	0.39	0.37
				SBOL		0.34	0.36	0.35
				SBIL		0.35	0.38	0.37
37012	US 27 BR from 0.62 to 0.82 (Lincoln Rd, 0.79) City of Mt. Pleasant	28	43	NBOL	Conc	0.34	0.36	0.35
				NBIL		0.36	0.37	0.37
				SBOL		0.34	0.35	0.34
				SBIL		0.36	0.36	0.36
37021	M 20 from 15.35 to 15.55 (Pleasant, 15.35; Main, 15.50) City of Mt. Pleasant	28	36	EBOL	Bit	0.47	0.48	0.48
				EBIL		0.38	0.45	0.41
				WBOL		0.38	0.41	0.40
				WBIL		0.43	0.51	0.47
Kent County								
41012	M 44 Conn. from 0.68 to 0.87 (4 Mile Rd, 0.74) Plainfield Twp.	42	36	NB	Bit	0.51	0.54	0.52
				SB		0.51	0.52	0.52
41012	M 44 Conn. from 0.90 to 1.07 (Richerton St, 1.05) Plainfield Twp.	20	45	NB	Bit	0.46	0.52	0.48
				SB		0.42	0.53	0.48
41013	M 44 from 0.46 to 0.62 (West River Rd, 0.62) Plainfield Twp.	20	35					
				South of Bridge Deck				
				NBOL	Bit	0.40	0.46	0.42
				NBIL		0.49	0.52	0.51
				SBOL		0.39	0.41	0.40
				SBIL		0.46	0.48	0.47
				On Bridge Deck				
				NBOL	Conc	0.34	0.38	0.36
				NBIL		0.31	0.35	0.33
				SBOL		0.33	0.34	0.33
				SBIL		0.35	0.38	0.36
Mecosta County								
54012	US 131 - M 20 from 0.20 to 0.40 (Perry St, 0.30) City of Big Rapids	25	36	NBOL	Bit	0.56	0.63	0.60
				NBIL		0.57	0.59	0.58
				SBOL		0.60	0.67	0.64
				SBIL		0.64	0.65	0.65
Muskegon County								
61153	BS 96 from 0.93 to 1.04 (Eastern, 0.96) City of Muskegon	22	36	NBOL	Bit	0.35	0.39	0.37
				NB #3		0.38	0.41	0.39
				NB #2		0.38	0.38	0.38
				NBIL		0.41	0.44	0.43
				SBOL		0.35	0.38	0.37
				SB #3		0.37	0.40	0.38
				SB #2		0.40	0.41	0.41
				SBIL		0.45	0.53	0.50

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 5 CONT.

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Ottawa County								
70011	US 31 BR from 1.28 to 1.47 (12th St, 1.35) City of Holland	23	39	NBOL	Bit	0.34	0.38	0.36
				NBIL		0.36	0.37	0.37
				SBOL		0.36	0.38	0.37
				SBIL		0.39	0.42	0.41
70012	M 21 - US 31 BR from 0.00 to 0.20 (River St, 0.00) City of Holland	24	33	EBOL	Bit	0.44	0.48	0.46
				EBCL		0.43	0.44	0.44
				EBIL		0.49	0.51	0.50
70012	M 21 - US 31 BR from 0.72 to 0.92 (Fairbanks, 0.92) City of Holland	22	36	EBOL	Bit	0.38	0.41	0.40
				EBIL		0.42	0.43	0.42
				WBOL		0.42	0.42	0.42
				WBIL		0.41	0.44	0.42
70012	M 21 - US 31 BR from 80.00 to 80.18 (River Ave, 80.00) City of Holland	20	30	WBOL	Bit	0.42	0.44	0.43
				WBCL		0.45	0.48	0.47
				WBIL		0.45	0.48	0.46
70014	US 31 from 5.72 to 5.92 (Taylor St, 5.91) City of Grand Haven	20	35	NBOL	Conc	0.38	0.39	0.39
				NBIL		0.37	0.39	0.38
				SBOL		0.32	0.34	0.33
				SBIL		0.34	0.38	0.36
70021	US 31 from 0.00 to 0.20 (Ottogan Rd, 0.00) City of Holland	20	30	NBOL	Conc	0.38	0.39	0.39
				NBIL		0.42	0.45	0.44
				SBOL		0.40	0.43	0.42
				SBIL		0.42	0.43	0.42
70021	US 31 from 1.02 to 1.07 (16th St, 1.07) City of Holland	30	33	NBOL	Conc	0.41	0.41	0.41
				NBIL		0.41	0.45	0.43
				SBOL		0.41	0.43	0.42
				SBIL		0.48	0.52	0.49
70021	US 31 from 1.58 to 1.70 (8th St, 1.60) Holland Twp.	33	39	NBOL	Conc	0.38	0.40	0.39
				NBIL		0.47	0.49	0.48
				SBOL		0.40	0.42	0.41
				SBIL		0.46	0.50	0.48
70081	M 104 from 0.78 to 0.98 (Jackson St, 0.85) City of Spring Lake	26	35	EBOL	Conc	0.32	0.33	0.32
				EBIL		0.34	0.37	0.36
				WBOL		0.33	0.38	0.35
				WBIL		0.33	0.33	0.33

DISTRICT 6

Bay County								
09042	M 25 - BL 75 from 2.80 to 3.00 (Saginaw St, 3.00) City of Bay City	32	34	EBOL	Conc	0.24	0.27	0.25
				EBCL		0.26	0.30	0.28
				EBIL		0.27	0.28	0.27
				WBOL		0.28	0.30	0.29
				WBCL		0.22	0.23	0.22
				WBIL		0.27	0.31	0.29
09042	M 25 - BL 75 from 3.04 to 3.24 (Jefferson St, 3.17) City of Bay City	46	33	EBOL	Conc	0.32	0.33	0.33
				EBCL		0.28	0.32	0.30
				EBIL		0.28	0.31	0.29
				WBOL		0.31	0.36	0.34
				WBCL		0.28	0.30	0.29
				WBIL		0.27	0.30	0.28
09042	M 25 - BL 75 from 4.02 to 4.22 (Trumbull St, 4.42) City of Bay City	28	32	W of Johnson St				
				EBOL	Bit	0.42	0.44	0.43
				EBIL		0.42	0.45	0.43
				WBOL		0.35	0.36	0.36
				WBIL		0.39	0.43	0.41
				E of Johnson St				
				EBOL	Conc	0.30	0.33	0.31
				EBIL		0.30	0.33	0.31
				WBOL		0.31	0.32	0.31
				WBIL		0.27	0.29	0.28

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 6 CONT.

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Bay County (Cont.)								
09042	M 25 - BL 75 from 5.06 to 5.26 (Scheurman St, 5.25) Hampton Township	26	54	EBOL	Conc	0.25	0.29	0.28
				EBIL	Bit	0.24	0.26	0.25
				WBOL	Conc	0.29	0.29	0.29
				WBIL	Bit	0.24	0.27	0.25
09042	M 25 - BL 75 from 5.70 to 5.90 (Orchard St, 5.90) Hampton Township	22	36	EB	Bit	0.28	0.31	0.29
				WB		0.28	0.33	0.32
Genesee County								
25071	M 54 from 3.87 to 4.07 (Perry Rd, 4.05) City of Grand Blanc	20	35	NBOL	Bit	0.42	0.43	0.42
				NBIL		0.40	0.44	0.41
				SBOL		0.38	0.39	0.38
				SBIL		0.45	0.50	0.48
25071	M 54 from 4.17 to 4.37 (Grand Blanc Rd, 4.37) City of Grand Blanc	24	42	NBOL	Bit	0.35	0.37	0.36
				NBIL		0.43	0.45	0.44
				SBOL		0.38	0.40	0.39
				SBIL		0.42	0.44	0.43
25072	M 54 from 4.18 to 4.38 (Lapeer Rd, 4.37) City of Flint	39	44	NBOL	Bit	0.21	0.29	0.24
				NBIL		0.37	0.39	0.38
				SBOL		0.35	0.36	0.36
				SBIL		0.39	0.41	0.40
25072	M 54 from 4.39 to 4.59 (M 78, 4.44) City of Flint	57	46	NBOL	Bit	0.29	0.34	0.31
				NBCL		0.29	0.31	0.30
				NBIL		0.30	0.34	0.31
				SBOL		0.34	0.37	0.36
				SBCL		0.31	0.35	0.34
				SBIL		0.40	0.41	0.40
25072	M 54 from 4.81 to 5.01 (Court St, 5.01) City of Flint	30	47	NBOL	Bit	0.37	0.38	0.37
				NBIL		0.34	0.37	0.36
				SBOL		0.30	0.34	0.32
				SBIL		0.43	0.45	0.44
25072	M 54 from 5.48 to 5.68 (R. T. Longway, 5.60) City of Flint	45	31	NBOL	Bit	0.34	0.37	0.36
				NBIL		0.39	0.42	0.40
				SBOL		0.34	0.36	0.35
				SBIL		0.39	0.41	0.40
25072	M 54 from 5.81 to 6.01 (Davison Rd, 6.01) City of Flint	43	47	NBOL	Bit	0.43	0.46	0.45
				NBIL		0.42	0.49	0.45
				SBOL		0.39	0.43	0.41
				SBIL		0.48	0.51	0.49
25072	M 54 from 8.09 to 8.29 (Boulevard, 8.11) City of Flint	20	60	NBOL	Bit	0.25	0.29	0.27
				NBIL		0.31	0.34	0.32
				SBOL		0.26	0.28	0.27
				SBIL		0.27	0.30	0.29
25072	M 54 from 12.32 to 12.42 (Mt. Morris, 12.40) Genesee Township	21	33	NBOL	Bit	0.37	0.42	0.38
				NBIL		0.43	0.48	0.45
				SBOL		0.36	0.37	0.36
				SBIL		0.41	0.46	0.44
25085	M 21 EB Service Dr (9th St) from 72.64 to 72.83 (Grand Traverse, 72.65) City of Flint	21	38	EBOL	Bit	0.33	0.36	0.35
				EBCL		0.37	0.40	0.38
				EBIL		0.41	0.45	0.43
				EBOL	Conc	0.29	0.35	0.33
				EBCL		0.27	0.30	0.28
				EBIL		0.28	0.31	0.30
Lapeer County								
44012	M 24 from 0.38 to 0.52 (Oregon, 0.43) City of Lapeer	32	37	NBOL	Conc	0.26	0.30	0.28
				NBIL		0.28	0.33	0.30
				SBOL		0.30	0.32	0.31
				SBIL		0.32	0.32	0.32
44012	M 24 from 2.45 to 2.65 (Saginaw Rd, 2.60) Mayfield Township	20	35	NB	Conc	0.31	0.32	0.31
				SB		0.28	0.32	0.29

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 6 CONT.

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Midland County								
56021	M 20 from 18.03 to 18.23 (Ann, 18.22) City of Midland	25	48	EBOL	Conc	0.21	0.26	0.24
				EBIL		0.32	0.36	0.35
				WBOL		0.34	0.37	0.36
				WBIL		0.32	0.34	0.33
				Bridge Deck				
				EBOL	Bit	0.25	0.30	0.28
				EBIL		0.34	0.37	0.36
				WBOL		0.30	0.32	0.31
				WBIL		0.25	0.28	0.27
56021	M 20 from 18.24 to 18.36 (Main, 18.26) City of Midland	22	32	EBOL	Bit	0.26	0.31	0.29
				EBIL		0.28	0.38	0.32
				WBOL		0.34	0.37	0.35
				WBIL		0.30	0.34	0.31
Saginaw County								
73051	M 13 from 15.66 to 15.85 (Martindale, 15.68) City of Saginaw	25	32	NB	Bit	0.37	0.42	0.39
				SB		0.30	0.32	0.31
				NBOL	Conc	0.28	0.30	0.29
				NBIL		0.27	0.30	0.28
73051	M 13 from 16.39 to 16.59 (M 46, 16.58) City of Saginaw	40	32	NBOL	Bit	0.36	0.39	0.38
				NBIL		0.37	0.41	0.39
				SBOL		0.36	0.38	0.37
				SBIL		0.41	0.42	0.41
73051	M 13 from 17.16 to 17.36 (Holland Ave, 17.30) City of Saginaw	36	31	NBOL	Bit	0.36	0.41	0.38
				NBIL		0.36	0.39	0.38
				SBOL		0.33	0.35	0.34
				SBIL		0.37	0.41	0.39
73063	M 46 from 0.38 to 0.57 (Jefferson Ave, 0.50) City of Saginaw	27	33	EBOL	Conc	0.27	0.31	0.30
				EBIL		0.31	0.36	0.33
				WBOL		0.30	0.34	0.31
				WBIL		0.34	0.36	0.35
73063	M 46 from 2.29 to 2.49 (N 17th St, 2.33) City of Saginaw	22	45	EBOL	Bit	0.23	0.27	0.25
				EBIL		0.23	0.27	0.24
				WBOL		0.29	0.31	0.30
				WBIL		0.25	0.26	0.26
73073	M 58 from 4.83 to 5.03 (M 47, 5.01) City of Saginaw	20	60	EBOL	Conc	0.36	0.41	0.38
				EBIL		0.37	0.37	0.37
				WBOL		0.28	0.34	0.31
				WBIL		0.30	0.38	0.35
				EBOL	Bit	0.35	0.44	0.41
				EBIL		0.29	0.41	0.34
				WBOL		0.34	0.40	0.37
				WBIL		0.32	0.37	0.34
73073	M 58 from 80.06 to 80.23 (I 675, 80.06) City of Saginaw	21	39	EBOL	Bit	0.35	0.37	0.36
				EBIL		0.33	0.35	0.34
				WBOL	Conc	0.30	0.31	0.30
				WBCL		0.30	0.30	0.30
				WBIL		0.28	0.29	0.28
73073	M 58 from 80.68 to 80.86 (Mason St, 80.80) City of Saginaw	21	48	EBOL	Bit	0.23	0.26	0.24
				EBIL		0.26	0.27	0.26
				WBOL	Conc	0.27	0.29	0.28
				WBCL		0.27	0.29	0.28
				WBIL		0.29	0.30	0.30
73073	M 58 from 82.14 to 82.34 (Warwick, 82.30) City of Saginaw	20	55	EBOL	Bit	0.22	0.25	0.23
				EBCL		0.23	0.26	0.24
				EBIL		0.23	0.27	0.25
				WBOL	Conc	0.27	0.27	0.27
				WBCL		0.27	0.29	0.28
				WBIL		0.27	0.31	0.29

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 7

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Berrien County								
11013	BL 94 from 2.03 to 2.22 (Benton St, 2.10) City of Benton Harbor	23	44	NB	Bit	0.41	0.46	0.44
				SB		0.44	0.47	0.46
11013	BL 94 from 80.00 to 80.20 (On Port St, One Way Westbound) City of St. Joseph	25	40	WBOL	Conc	0.33	0.39	0.37
				WBCL		0.33	0.35	0.34
				WBIL		0.35	0.36	0.36
11041	US 31 - US 33 from 0.22 to 0.41 (Fourth St, 0.23; Seventh St, 0.40) City of Niles	39	41	NB	Bit	0.26	0.29	0.28
				SB		0.31	0.34	0.33
11041	US 31 - US 33 from 0.43 to 0.63 (Ninth St, 0.53) City of Niles	25	36	NB	Bit	0.30	0.33	0.31
				SB		0.27	0.35	0.32
11052	US 31 - US 33 from 9.66 to 9.85 (Rt turns NW on Cass, 9.72) City of Berrien Springs	34	35	NBOL	Bit	0.39	0.41	0.40
				NBIL		0.41	0.46	0.44
				SBOL		0.39	0.44	0.41
				SBIL		0.27	0.34	0.30
Branch County								
12021	US 12 from 17.38 to 17.58 (Clay St, 17.58) City of Coldwater	31	53	EBOL	Bit	0.30	0.31	0.31
				EBIL		0.32	0.34	0.33
				WBOL		0.32	0.35	0.34
				WBIL		0.31	0.31	0.31
Calhoun County								
13043	BL 94 from 0.99 to 1.19 (Austin Ave, 0.99; N. Superior St, 1.19) City of Albion	20	40	EBOL	Bit	0.33	0.36	0.35
				EBIL		0.29	0.30	0.29
				WBOL		0.28	0.32	0.30
				WBIL		0.30	0.30	0.30
13043	BL 94 from 1.42 to 1.59 (Jct. M 99, 1.44) City of Albion	20	45	EBOL	Bit	0.34	0.35	0.34
				EBIL		0.30	0.32	0.31
				WBOL		0.28	0.30	0.29
				WBIL		0.30	0.33	0.31
13061	M 37 from 6.32 to 6.50 (Washington, 6.50) City of Battle Creek	31	36	EBOL	Bit	0.39	0.40	0.40
				EBCL		0.36	0.38	0.37
				EBIL		0.38	0.44	0.41
13061	M 37 from 6.94 to 7.14 (Capital Ave, 7.02) City of Battle Creek	40	33	EBOL	Bit	0.49	0.51	0.50
				EBCL		0.44	0.48	0.46
				EBIL		0.45	0.48	0.47
				WBOL		0.48	0.52	0.50
				WBCL		0.44	0.48	0.46
				WBIL		0.53	0.55	0.54
13061	M 37 from 7.15 to 7.34 (Jct I 194 - M 66 - I 94 BL, Division at Jackson, 7.28, M 37 ends) City of Battle Creek	28	36	EBOL	Bit	0.42	0.43	0.43
				EB #3		0.41	0.41	0.41
				EB #2		0.37	0.41	0.38
				EBIL		0.37	0.42	0.40
				WBOL		0.44	0.47	0.45
				WBCL		0.42	0.45	0.44
				WBIL		0.50	0.51	0.50
13061	M 37 from 8.17 to 8.37 (Greenville St, 8.24) City of Battle Creek	21	38	EBOL	Bit	0.44	0.48	0.46
				EBIL		0.41	0.44	0.43
				WBOL		0.39	0.43	0.41
				WBIL		0.39	0.45	0.42
13061	M 37 from 86.24 to 86.44 (Washington, 86.41) City of Battle Creek	24	42	WBOL	Bit	0.44	0.51	0.48
				WBCL		0.48	0.51	0.50
				WBIL		0.52	0.57	0.55
13121	I 94 BL from 7.20 to 7.40 (Washington (Ravine), 7.38) City of Battle Creek	32	34	EBOL	Bit	0.53	0.54	0.53
				EBIL		0.50	0.51	0.51
				WBOL		0.37	0.42	0.40
				WBIL		0.52	0.56	0.54
13121	I 94 BL from 7.52 to 7.72 (Capital Ave, 7.71) City of Battle Creek	27	48	EBOL	Bit	0.44	0.48	0.46
				EBIL		0.48	0.52	0.50
				WBOL		0.43	0.47	0.45
				WBIL		0.46	0.55	0.51

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 7 CONT.

Control Section	Location and Mileage	1972 Accidents Total	1972 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
Calhoun County (Cont.)								
13121	I 94 BL from 7.81 to 8.00 (Riverside Dr., 8.00) City of Battle Creek	25	32	EBOL	Conc	0.38	0.41	0.40
				EBIL		0.40	0.42	0.41
				WBOL		0.41	0.43	0.42
				WBIL		0.39	0.44	0.41
Kalamazoo County								
39042	BL 94 from 0.63 to 0.83 (On EB Michigan; Porter, 0.66; Harrison, 0.83) City of Kalamazoo	36	33	EBOL	Bit	0.42	0.45	0.44
				EBCL		0.43	0.45	0.44
				EBIL		0.44	0.48	0.46
39042	BL 94 from 1.58 to 1.78 (Crosstown Pkwy., 1.59) City of Kalamazoo	30	43	EBOL	Bit	0.41	0.44	0.43
				EBIL		0.43	0.45	0.44
				WBOL		0.44	0.44	0.44
				WBIL		0.42	0.45	0.43
				EBOL	Conc	0.32	0.35	0.33
				EBIL		0.30	0.33	0.32
				WBOL		0.34	0.38	0.37
				WBIL		0.38	0.41	0.40
St. Joseph County								
78022	US 12 from 12.74 to 12.93 (Fourth St, 12.88) City of Sturgis	31	36	EBOL	Conc	0.34	0.36	0.35
				EBIL		0.35	0.36	0.35
				WBOL		0.34	0.35	0.35
				WBIL		0.35	0.38	0.36
78022	US 12 from 13.01 to 13.20 (Jean St, 13.00) City of Sturgis	33	33	EBOL	Conc	0.35	0.38	0.36
				EBIL		0.36	0.38	0.37
				WBOL		0.35	0.36	0.36
				WBIL		0.36	0.37	0.37

DISTRICT 8

Control Section	Location and Mileage	1972 Accidents Total	1972 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
Eaton County								
23091	M 50 - M-99 from 6.25 to 6.45 (Knight, 6.44) City of Eaton Rapids	24	33	NBOL	Bit	0.36	0.39	0.38
				NBIL		0.35	0.38	0.37
				SBOL		0.37	0.37	0.37
				SBIL		0.37	0.39	0.38
Ingham County								
33032	BL 96 from 5.81 to 6.00 (Baker St, 5.99) City of Lansing	30	50	NBOL	Bit	0.36	0.40	0.38
				NBIL		0.38	0.41	0.40
				SBOL		0.35	0.40	0.38
				SBIL		0.39	0.41	0.40
				NBOL	Conc	0.31	0.33	0.32
				NBIL		0.30	0.34	0.32
				SBOL		0.30	0.33	0.31
				SBIL		0.33	0.35	0.34
33061	M 43 from 1.66 to 1.85 (Logan St, 1.85) City of Lansing	36	39	EBOL	Conc	0.30	0.33	0.31
				EB #3		0.32	0.33	0.32
				EB #2		0.30	0.33	0.32
				EBIL		0.30	0.35	0.32
				WBOL		0.34	0.36	0.35
				WBCL		0.33	0.36	0.35
				WBIL		0.31	0.34	0.33
33082	M 43 from 2.14 to 2.34 (Spartan Ave, 2.16) City of East Lansing	23	39	EBOL	Bit	0.42	0.44	0.43
				EBIL		0.42	0.44	0.43
				WBOL		0.37	0.41	0.39
				WBIL		0.41	0.44	0.42
33082	M 43 from 2.35 to 2.55 (Hagadorn, 2.37) City of East Lansing	69	38	EBOL	Bit	0.39	0.41	0.40
				EBIL		0.37	0.42	0.39
				WBOL		0.42	0.44	0.43
				WBIL		0.41	0.44	0.42

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 8 CONT.

Control Section	Location and Mileage	1972 Accidents Total	1972 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
Ingham County (Cont.)								
33082	M 43 from 3.99 to 4.19 (Okemos Rd, 4.17) Meridian Twp.	37	41	EBOL	Bit	0.39	0.41	0.40
				EBIL		0.45	0.48	0.46
				WBOL		0.40	0.45	0.43
				WBIL		0.42	0.46	0.44
33082	M 43 from 4.36 to 4.56 (Marsh Rd, 4.56) Meridian Twp.	29	38	EBOL	Bit	0.49	0.52	0.50
				EBIL		0.46	0.51	0.49
				WBOL		0.48	0.50	0.49
				WBIL		0.44	0.47	0.45
33171	US 127, Howard St. from 60.66 to 60.83 (EB Michigan, 60.82) City of Lansing	22	50	NBOL	Conc	0.31	0.33	0.32
				NBCL		0.33	0.36	0.35
				NBIL		0.34	0.37	0.35
Jackson County								
38072	US 127 BR from 0.66 to 0.86 (Argyle, 0.71) City of Jackson	20	50	NBOL	Conc	0.29	0.30	0.30
				NBIL	Bit	0.34	0.37	0.36
				SBOL	Conc	0.25	0.27	0.26
				SBIL	Bit	0.35	0.39	0.37
38072	US 127 BR from 0.87 to 1.06 (North St, 0.92) City of Jackson	37	43					
				North of North St				
				NBOL	Conc	0.26	0.27	0.27
				NBIL	Bit	0.34	0.34	0.34
				SBOL	Conc	0.24	0.27	0.26
				SBIL	Bit	0.34	0.37	0.35
				South of North St				
				NB	Bit	0.35	0.37	0.36
				SB		0.31	0.34	0.33
38072	US 127 BR from 1.13 to 1.25 (Ganson St, 1.22) City of Jackson	22	36	NB	Bit	0.30	0.33	0.31
				SB		0.34	0.36	0.35
38083	EB BL 94 from 0.65 to 0.84 (Blackstone, 0.65; Jackson, 0.83) City of Jackson	46	37	EBOL	Conc	0.30	0.33	0.31
				EBCL		0.27	0.30	0.28
				EBIL		0.28	0.30	0.29
38083	EB BL 94 from 0.86 to 1.04 (Mechanic, 0.96) City of Jackson	49	33	EBOL	Conc	0.29	0.33	0.31
				EBCL		0.27	0.30	0.28
				EBIL		0.27	0.30	0.28
38083	EB BL 94 from 1.14 to 1.32 (Jct. SB M 50, 1.14) City of Jackson	42	43					
				3 Lane Portion				
				EBOL	Conc	0.36	0.36	0.36
				EBCL		0.27	0.29	0.28
				EBIL		0.28	0.34	0.32
				4 Lane Portion				
				EBOL	Conc	0.30	0.33	0.32
				EB #3		0.25	0.32	0.28
				EB #2		0.28	0.31	0.30
				EBIL		0.27	0.32	0.30
38083	BL 94 from 1.35 to 1.54 (Michigan Ave, 1.40) City of Jackson	34	41	EBOL	Bit	0.24	0.27	0.25
				EBIL		0.25	0.26	0.25
				WBOL		0.23	0.25	0.24
				WBIL		0.20	0.24	0.23
38083	WB BL 94 from 80.34 to 80.52 (Michigan-Washington @ Glick, 80.35) City of Jackson	22	36	WBOL	Conc	0.25	0.32	0.29
				WB #3		0.28	0.31	0.30
				WB #2		0.31	0.32	0.31
				WBIL		0.30	0.33	0.32
38083	WB BL 94 from 80.56 to 80.73 (Blackstone, 80.64) City of Jackson	23	35	WBOL	Conc	0.26	0.32	0.29
				WBCL		0.28	0.30	0.29
				WBIL		0.33	0.34	0.33
38083	WB BL 94 from 80.77 to 80.97 (Mechanic, 80.95) City of Jackson	43	40	WBOL	Conc	0.27	0.31	0.29
				WBCL		0.30	0.33	0.31
				WBIL		0.28	0.33	0.30

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 8 CONT.

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Lenawee County								
46061	US 223 BR from 19.65 to 19.85 (Chandler, 19.73) City of Adrian	20	45	EB	Bit	0.33	0.34	0.34
				WB		0.38	0.41	0.39
46061	US 223 BR from 21.28 to 21.48 (Jct. US 223, 21.74) City of Adrian	24	42	NBOL	Conc	0.27	0.28	0.28
				NBIL		0.27	0.28	0.27
				SBOL		0.23	0.26	0.24
				SBIL		0.22	0.23	0.22
46082	M 50 from 2.92 to 3.11 (Union, 2.92; Pearl, 3.09) City of Tecumseh	21	38	EBOL	Bit	0.33	0.33	0.33
				EBIL		0.27	0.30	0.28
				WBOL		0.31	0.34	0.33
				WBIL		0.33	0.34	0.34
Monroe County								
58052	US 24 from 7.50 to 7.61 (Dunbar Rd, 7.60) Monroe Twp.	27	37	NB	Bit	0.15	0.20	0.17
				SBOL		0.32	0.33	0.33
				SBIL		0.29	0.42	0.37
58053	US 24 from 8.58 to 8.78 (S. Huron River Dr, 8.76) Monroe Twp.	21	38	NBOL	Bit	0.27	0.28	0.28
				NBIL		0.37	0.39	0.38
				SBOL		0.24	0.27	0.25
				SBIL		0.34	0.37	0.35
Washtenaw County								
81072	BL 94 from 0.00 to 0.20 (Main, 0.00) City of Ann Arbor	31	35	EBOL	Bit	0.37	0.40	0.38
				EBIL		0.30	0.34	0.32
				WBOL		0.37	0.38	0.37
				WBIL		0.37	0.40	0.39
81072	BL 94 from 0.21 to 0.41 (Division, 0.23) City of Ann Arbor	51	38	EBOL	Bit	0.35	0.37	0.36
				EBIL		0.41	0.42	0.42
				WBOL		0.28	0.34	0.32
				WBIL		0.29	0.31	0.30
81072	BL 94 from 0.44 to 0.57 (Thayer, 0.44; Fletcher, 0.56) City of Ann Arbor	20	35	EBOL	Bit	0.34	0.37	0.36
				EBIL		0.31	0.35	0.33
				WBOL		0.34	0.40	0.37
				WBIL		0.40	0.41	0.41
81072	BL 94 from 1.00 to 1.20 (Washtenaw, 1.06) City of Ann Arbor	37	38	EBOL	Bit	0.38	0.41	0.40
				EBIL		0.46	0.47	0.47
				WBOL		0.37	0.41	0.39
				WBIL		0.46	0.48	0.47
81081	M 17 from 1.05 to 1.25 (Golfside Rd, 1.22) Pittsfield Twp.	65	45	EBOL	Conc	0.26	0.29	0.27
				EBIL		0.23	0.24	0.24
				WBOL		0.24	0.27	0.25
				WBIL		0.25	0.27	0.26
81081	M 17 from 1.47 to 1.66 (Boston Ave, 1.58) Ypsilanti Twp.	26	46	EBOL	Conc	0.23	0.25	0.24
				EBIL		0.24	0.25	0.24
				WBOL		0.24	0.27	0.25
				WBIL		0.22	0.24	0.23
81081	M 17 from 1.68 to 1.87 (Hewitt Rd, 1.87) Ypsilanti Twp.	37	46	EBOL	Conc	0.27	0.27	0.27
				EBIL		0.23	0.24	0.23
				WBOL		0.24	0.29	0.26
				WBIL		0.21	0.21	0.21
81081	M 17 from 2.13 to 2.33 (Berkely Ave, 2.15; Douglas St, 2.33) City of Ypsilanti	31	55	EBOL	Conc	0.21	0.24	0.22
				EBIL		0.18	0.21	0.20
				WBOL		0.24	0.26	0.25
				WBIL		0.24	0.26	0.25
81081	M 17 from 2.34 to 2.53 (Cornell St, 2.49) City of Ypsilanti	32	47	EBOL	Conc	0.22	0.24	0.23
				EBIL		0.21	0.24	0.22
				WBOL		0.26	0.27	0.27
				WBIL		0.24	0.31	0.27

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

DISTRICT 8 CONT.

Control Section	Location and Mileage	1972 Accidents Total	1972 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
Washtenaw County (Cont.)								
81081	M 17 from 2.60 to 2.80 (Roosevelt Blvd, 2.64) City of Ypsilanti	36	42	EBOL	Conc	0.27	0.30	0.28
				EBIL		0.27	0.28	0.27
				WBOL		0.24	0.27	0.25
				WBIL		0.24	0.26	0.25
81081	M 17 from 2.89 to 3.06 (Summit, 3.04) City of Ypsilanti	39	64	EBOL	Conc	0.24	0.28	0.27
				EBCL		0.26	0.27	0.26
				EBIL		0.34	0.35	0.35
81081	M 17 from 80.16 to 80.35 (Cross Blvd, 80.33) City of Ypsilanti	41	39	WBOL	Conc	0.26	0.29	0.28
				WBCL		0.25	0.27	0.26
				WBIL		0.30	0.34	0.32
81082	M 17 from 0.21 to 0.41 (Hawthorne, 0.22; Davis, 0.41) E. Boundary Limits of Ypsilanti	29	38	EB	Bit	0.31	0.33	0.32
				WB		0.33	0.35	0.34
81082	M 17 from 0.50 to 0.70 (Oaklawn Blvd, 0.66) Ypsilanti Twp.	29	52	EB	Bit	0.34	0.36	0.35
				WB		0.31	0.34	0.33
81083	US 12 BR from 60.33 to 60.52 (Harriet St, 60.34) City of Ypsilanti	24	42	NBOL	Conc	0.31	0.34	0.33
				NBCL		0.25	0.32	0.29
				NBIL		0.28	0.36	0.32
				SBOL		0.27	0.32	0.30
				SBCL		0.26	0.29	0.27
				SBIL		0.37	0.40	0.39

METRO DISTRICT

Control Section	Location and Mileage	1972 Accidents Total	1972 Accidents % Wet Surface	Lane Tested	Surface Type	Coefficient of wsf Low	Coefficient of wsf High	Coefficient of wsf Avg
Macomb County								
50011	M 53 from 1.00 to 1.20 (Timken, 1.22) City of Warren	35	31	NBOL	Bit	0.27	0.32	0.30
				NBCL		0.30	0.33	0.31
				NBIL		0.30	0.34	0.32
				SBOL		0.31	0.33	0.32
				SBCL		0.29	0.33	0.31
				SBIL		0.32	0.34	0.33
50011	M 53 from 5.59 to 5.79 (Murthum Rd, 5.67) City of Warren	34	56	NBOL	Conc	0.26	0.28	0.27
				NBCL		0.24	0.26	0.25
				NBIL		0.25	0.26	0.25
				SBOL		0.18	0.20	0.19
				SBCL		0.19	0.22	0.21
				SBIL		0.22	0.23	0.22
50011	M 53 from 5.80 to 6.00 (Trembleton, 5.96) City of Warren	31	39	NBOL	Conc	0.20	0.24	0.22
				NBCL		0.24	0.25	0.24
				NBIL		0.22	0.25	0.24
				SBOL		0.18	0.21	0.19
				SBCL		0.21	0.23	0.22
				SBIL		0.21	0.23	0.22
50011	M 53 from 8.52 to 8.66 (16-1/2 Mile Rd, 8.62) City of Sterling Heights	36	47	NBOL	Bit	0.28	0.32	0.30
				NBIL		0.31	0.34	0.32
				SBOL	Conc	0.23	0.26	0.25
				SBCL		0.25	0.30	0.28
				SBIL		0.26	0.26	0.26
50011	M 53 from 8.94 to 9.14 (17 Mile Rd, 9.26) City of Sterling Heights	33	36	NBOL	Conc	0.30	0.31	0.30
				NBIL		0.33	0.34	0.34
				SBOL	Bit	0.37	0.39	0.38
				SBCL		0.37	0.38	0.37
				SBIL		0.39	0.40	0.39
50022	M 59 from 0.00 to 0.20 (Van Dyke, 0.00) City of Utica	46	37	EBOL	Bit	0.32	0.36	0.34
				EBOL	Conc	0.30	0.32	0.31
				EBIL	Bit	0.36	0.39	0.37
				WBOL	Bit	0.30	0.34	0.33
				WBOL	Conc	0.30	0.34	0.31
				WBIL	Bit	0.37	0.40	0.39

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

METRO DISTRICT CONT.

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Macomb County (Cont.)								
50031	M 97 from 11.53 to 11.73 (Cass Ave, 11.71) City of Mount Clemens	40	35	NBOL	Conc	0.30	0.31	0.31
				NBIL		0.29	0.30	0.29
				SBOL	Bit	0.31	0.32	0.31
				SBIL		0.34	0.35	0.35
50051	US 25 from 6.30 to 6.50 (Masonic Blvd, 6.36) City of Roseville	94	31	NBOL	Bit	0.50	0.54	0.52
				NB #3		0.38	0.43	0.40
				NB #2		0.39	0.42	0.40
				NBIL		0.46	0.50	0.47
				SBOL		0.31	0.37	0.34
				SB #3		0.35	0.40	0.37
				SB #2		0.36	0.40	0.38
				SBIL		0.45	0.49	0.47
50051	US 25 from 6.79 to 6.93 (14 Mile Rd, 6.88) City of Roseville	70	36	NBOL	Bit	0.46	0.54	0.49
				NB #3		0.38	0.39	0.39
				NB #2		0.47	0.50	0.48
				NBIL		0.46	0.50	0.48
				SBOL		0.41	0.47	0.43
				SB #3		0.42	0.46	0.44
				SB #2		0.39	0.43	0.41
				SBIL		0.44	0.47	0.45
50051	US 25 from 7.96 to 8.16 (15 Mile Rd, 8.00) Clinton Twp.	63	34	NBOL	Conc	0.24	0.29	0.26
				NBIL		0.24	0.25	0.24
				SBOL		0.30	0.35	0.32
				SB #3		0.34	0.36	0.35
				SB #2		0.35	0.36	0.36
				SBIL		0.31	0.35	0.33
50051	US 25 from 8.92 to 9.12 (EB Metropolitan Pkwy, 9.13) Clinton Twp.	46	39	NBOL	Conc	0.25	0.25	0.25
				NBIL		0.22	0.24	0.23
				SBOL		0.16	0.20	0.18
				SB #3		0.24	0.25	0.24
				SB #2		0.28	0.33	0.30
				SBIL		0.31	0.33	0.32
50072	M 29 from 4.26 to 4.46 (Washington, 4.29) City of New Baltimore	33	33	EBOL	Bit	0.34	0.37	0.35
				EBIL		0.34	0.35	0.35
				WBOL		0.37	0.38	0.38
				WBIL		0.33	0.37	0.35
Oakland County								
63022	I 96 from 10.10 to 10.39 (EB I 96 entrance loop from Novi Rd, 10.34) City of Novi	45	33	EBOL	Conc	0.24	0.27	0.25
				EBCL		0.28	0.31	0.29
				EBIL		0.27	0.28	0.27
				WBOL		0.24	0.27	0.26
				WBCL		0.28	0.31	0.30
				WBIL		0.30	0.30	0.30
63031	US 24 from 0.92 to 1.12 (9 Mile Rd, 1.00) City of Southfield	52	39	NBOL	Conc	0.35	0.37	0.36
				NB #3		0.34	0.37	0.36
				NB #2		0.38	0.40	0.39
				NBIL		0.34	0.37	0.36
				SBOL		0.36	0.37	0.37
				SB #3		0.36	0.41	0.38
				SB #2		0.39	0.41	0.40
				SBIL		0.36	0.41	0.39
63031	US 24 from 1.78 to 1.98 (10 Mile Rd, 2.03) City of Southfield	27	52	NBOL	Conc	0.34	0.37	0.35
				NB #3		0.36	0.40	0.38
				NB #2		0.38	0.42	0.40
				NBIL		0.38	0.42	0.40
				SBOL		0.32	0.36	0.34
				SB #3		0.35	0.37	0.36
				SB #2		0.37	0.40	0.39
				SBIL		0.38	0.40	0.39

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Oakland County (Cont.)								
63031	US 24 from 2.44 to 2.57 (Franklin, 2.56) City of Southfield	25	31	NBOL	Conc	0.22	0.30	0.25
				NB #3		0.39	0.40	0.40
				NB #2		0.41	0.43	0.42
				NBIL		0.37	0.42	0.40
				SBOL		0.33	0.37	0.34
				SB #3		0.33	0.36	0.35
				SB #2		0.39	0.42	0.40
				SBIL		0.38	0.43	0.41
63031	US 24 from 2.67 to 2.87 (Swanson, 2.77) City of Southfield	39	49	NBOL	Conc	0.35	0.40	0.37
				NB #3		0.40	0.41	0.40
				NB #2		0.41	0.42	0.42
				NBIL		0.32	0.36	0.34
				SBOL		0.32	0.36	0.34
				SB #3		0.33	0.36	0.34
				SB #2		0.42	0.46	0.44
				SBIL		0.44	0.46	0.45
63052	US 10 from 1.85 to 2.05 (Elizabeth Lake Rd, 2.05) West City Limits of Pontiac	55	42	NBOL	Bit	0.34	0.34	0.34
				NBIL	Bit	0.38	0.38	0.38
				SBOL	Conc	0.26	0.27	0.26
				SBIL	Bit	0.35	0.37	0.36
63052	US 10 from 2.27 to 2.47 (M 59, 2.37) West City Limits of Pontiac	57	32	NBRT	Bit	0.43	0.45	0.44
				NBOL		0.40	0.43	0.41
				NBCL		0.40	0.43	0.42
				NBIL		0.39	0.43	0.41
				SBOL		0.39	0.42	0.41
				SBCL		0.37	0.41	0.39
	*SBIL barricaded for safety island construction, skid tests could not be conducted.			SBIL				*
63112	M 24 from 6.01 to 6.21 (Clarkston Rd, 6.11) Orion Twp.	45	33	NBOL	Bit	0.27	0.29	0.28
				NBIL		0.28	0.40	0.35
				SBOL		0.23	0.27	0.25
				SBIL		0.30	0.37	0.35
63112	M 24 from 6.65 to 6.83 (Heights Rd, 6.74) South City Limits of Lake Orion	35	46	NBOL	Conc	0.30	0.30	0.30
				NBOL	Bit	0.27	0.31	0.28
				NBIL	Bit	0.30	0.39	0.35
				SBOL	Bit	0.34	0.37	0.35
				SBOL	Conc	0.28	0.30	0.29
				SBIL	Conc	0.37	0.41	0.38
63151	I 75 BL - US 10 BR from 2.29 to 2.43 (Allison and Baldwin, 2.36) City of Pontiac	56	34					
				North of Baldwin				
				NBOL	Bit	0.33	0.34	0.34
				NBCL		0.37	0.39	0.38
				NBIL		0.35	0.41	0.38
				SBOL	Conc	0.27	0.34	0.31
				SBCL		0.24	0.24	0.24
				SBIL		0.23	0.25	0.24
				South of Baldwin				
				NBOL	Bit	0.37	0.41	0.40
				NB #3		0.36	0.37	0.37
				NB #2		0.37	0.43	0.40
				NBIL		0.39	0.42	0.40
63201	I 75 BL - US 10 BR from 0.23 to 0.39 (Whittemore, 0.25) City of Pontiac	35	40	NBOL	Conc	0.19	0.21	0.20
				NB #3		0.24	0.24	0.24
				NB #2		0.25	0.28	0.27
				NBIL		0.28	0.29	0.28
63201	I 75 BL - US 10 BR from 0.74 to 0.85 (Mt. Clemens, 0.83) City of Pontiac	32	34	NBOL	Conc	0.26	0.30	0.28
				NB #3		0.22	0.26	0.24
				NB #2		0.27	0.29	0.28
				NBIL		0.30	0.32	0.31

METRO DISTRICT CONT.

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Oakland County (Cont.)								
63201	I 75 BL - US 10 BR from 0.98 to 1.16 (NE BD Perry, 1.02) City of Pontiac	84	40	NBOL	Conc	0.27	0.30	0.29
				NB #5		0.25	0.28	0.27
				NB #4		0.26	0.27	0.26
				NB #3		0.27	0.29	0.28
				NB #2		0.28	0.30	0.29
				NBIL		0.27	0.28	0.28
63201	I 75 BL - US 10 BR from 1.92 to 2.12 (Lake St and Auburn St, 1.95) City of Pontiac	42	33	SBOL	Conc	0.24	0.27	0.26
				SB #3		0.24	0.25	0.25
				SB #2		0.25	0.27	0.26
				SBIL		0.27	0.30	0.28
St. Clair County								
77091	US 25 from 1.80 to 1.95 (Riverside Dr, 1.80) City of Port Huron	33	48	NBOL	Bit	0.27	0.27	0.27
				NBIL		0.33	0.34	0.33
				SBOL		0.28	0.29	0.29
				SBIL		0.30	0.33	0.31
Wayne County								
82052	US 24 from 5.01 to 5.19 (Northline, 5.11) City of Taylor	65	45	NBOL	Bit	0.37	0.41	0.39
				NBCL		0.36	0.38	0.37
				NBIL		0.38	0.41	0.40
				SBOL	Conc	0.31	0.33	0.32
				SBCL		0.35	0.36	0.36
				SBIL		0.31	0.33	0.32
82052	US 24 from 7.83 to 8.02 (Ecorse Rd, 8.12) City of Taylor	28	39	NBOL	Bit	0.33	0.37	0.35
				NBCL		0.37	0.42	0.40
				NBIL		0.42	0.45	0.43
				SBOL		0.30	0.37	0.34
				SBOL	Conc	0.33	0.37	0.35
				SBCL	Bit	0.32	0.36	0.35
				SBCL	Conc	0.34	0.36	0.35
				SBIL	Bit	0.43	0.45	0.44
				SBIL	Conc	0.38	0.42	0.40
82052	US 24 from 10.74 to 10.94 (Oxford, 10.76) City of Dearborn	30	40	NBOL	Bit	0.41	0.42	0.42
				NB #3		0.39	0.44	0.41
				NB #2		0.38	0.42	0.40
				NBIL		0.39	0.40	0.40
				SBOL	Conc	0.32	0.33	0.33
				SBCL		0.33	0.37	0.35
				SBIL		0.41	0.44	0.42
82062	US 12 from 5.43 to 5.63 (Oakman Blvd, 5.57) City of Dearborn	38	50	EBOL	Bit	0.35	0.37	0.36
				EBCL		0.35	0.40	0.38
				EBIL		0.37	0.41	0.39
				WBOL		0.37	0.40	0.39
				WBCL		0.36	0.40	0.38
				WBIL		0.39	0.41	0.40
82081	M 153 from 8.02 to 8.21 (Wayne Rd, 8.04) City of Westland	92	33	EBOL	Bit	0.29	0.30	0.30
				EBIL		0.32	0.34	0.33
				WBOL		0.31	0.34	0.33
				WBIL		0.33	0.35	0.34
82081	M 153 from 8.42 to 8.60 (Wildwood, 8.54) City of Westland	33	33	EBOL	Bit	0.28	0.30	0.29
				EBIL		0.31	0.34	0.33
				WBOL		0.28	0.31	0.29
				WBIL		0.29	0.32	0.31
82081	M 153 from 9.14 to 9.34 (Venoy, 9.32) City of Westland	53	32	EBOL	Bit	0.26	0.27	0.26
				EBIL		0.29	0.31	0.30
				WBOL		0.26	0.28	0.27
				WBIL		0.27	0.30	0.28

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

METRO DISTRICT CONT.

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Wayne County (Cont.)								
82081	M 153 from 15.90 to 16.10 (Evergreen, 16.0) City of Dearborn	31	35	EBRT	Conc	0.58	0.60	0.59
				EBOL		0.45	0.45	0.45
				EBCL		0.46	0.49	0.47
				EBIL		0.48	0.51	0.49
				WBOL		0.39	0.43	0.41
				WBCL		0.46	0.49	0.48
				WBIL		0.46	0.52	0.49
82101	M 14 from 7.78 to 7.93 (Levon Rd, 7.81) City of Livonia	37	32	EBOL	Bit	0.26	0.30	0.28
				EBIL		0.36	0.38	0.37
				WBOL		0.33	0.36	0.34
				WBIL		0.27	0.33	0.31
82101	M 14 from 8.61 to 8.81 (Stark Rd, 8.80) City of Livonia	69	33	EBOL	Bit	0.29	0.32	0.31
				EBIL		0.30	0.34	0.32
				WBOL		0.30	0.30	0.30
				WBIL		0.34	0.34	0.34
82101	M 14 from 9.16 to 9.36 (Farmington Rd, 9.36) City of Livonia	75	41	EBOL	Bit	0.30	0.33	0.31
				EBIL		0.31	0.33	0.32
				WBOL		0.30	0.30	0.30
				WBIL		0.34	0.35	0.34
82101	M 14 from 13.35 to 13.55 (Beech-Daly, 13.35) Redford Twp.	62	37	EBOL	Bit	0.31	0.34	0.33
				EBIL		0.36	0.37	0.37
				WBOL		0.30	0.34	0.32
				WBIL		0.34	0.35	0.34
82131	M 1 from 3.25 to 3.45 (Grand Ave, 3.28) City of Highland Park	93	37	NBOL	Bit	0.38	0.40	0.39
				NBIL		0.35	0.37	0.36
				SBOL		0.34	0.37	0.35
				SBIL		0.37	0.39	0.38
82131	M 1 from 3.46 to 3.66 (Winona, 3.48; McLean, 3.69) City of Highland Park	37	35	NBOL	Bit	0.38	0.40	0.39
				NBIL		0.37	0.37	0.37
				SBOL		0.37	0.39	0.38
				SBIL		0.35	0.39	0.37
82192	M 39 from 0.21 to 0.37 (WB Entrance Loop to SB I 75, 0.225) City of Lincoln Park	39	36	NBOL	Conc	0.37	0.38	0.37
				NBCL		0.34	0.38	0.36
				NBIL		0.38	0.39	0.38
				SBOL		0.34	0.38	0.36
				SBCL		0.40	0.41	0.41
				SBIL		0.37	0.38	0.38
82192	M 39 from 0.43 to 0.62 (Porter St, 0.44) City of Lincoln Park	37	35	NBOL	Bit	0.37	0.42	0.40
				NB #3		0.32	0.33	0.33
				NB #2		0.37	0.43	0.40
				NBIL		0.34	0.36	0.35
				SBOL		0.40	0.44	0.42
				SB #3		0.42	0.42	0.42
				SB #2		0.46	0.48	0.47
				SBIL		0.44	0.46	0.45
82192	M 39 from 0.64 to 0.83 (Dix-Toledo Hwy, 0.66) City of Lincoln Park	87	39	NBOL	Bit	0.36	0.40	0.38
				NB #3	Bit	0.38	0.39	0.39
				NB #2	Bit	0.39	0.42	0.41
				NBIL	Conc	0.40	0.41	0.40
				SBOL	Conc	0.41	0.41	0.41
				SB #3	Bit	0.41	0.43	0.42
				SB #2	Bit	0.39	0.41	0.40
				SBIL	Conc	0.43	0.47	0.45

TABLE 31 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH METROPOLITAN

METRO DISTRICT CONT.

Control Section	Location and Mileage	1972 Accidents		Lane Tested	Surface Type	Coefficient of wsf		
		Total	% Wet Surface			Low	High	Avg
Wayne County (Cont.)								
82192	M 39 from 1.50 to 1.70 (Roosevelt Rd S, 1.68) City of Allen Park	62	35	NBOL	Bit	0.36	0.41	0.39
				NB #3		0.34	0.36	0.35
				NB #2		0.36	0.37	0.37
				NBIL		0.41	0.41	0.41
				NBLT		0.36	0.41	0.39
				SBOL		0.38	0.39	0.39
				SB #3		0.32	0.33	0.32
				SB #2		0.36	0.41	0.38
				SBIL		0.46	0.48	0.47
				SBOLT		0.42	0.44	0.43
				SBILT		0.44	0.45	0.44
82211	M 85 from 3.66 to 3.86 (Van Horn Rd, 3.72) City of Trenton	35	34	NBOL	Conc	0.37	0.41	0.39
				NBIL		0.39	0.42	0.40
				SBOL		0.37	0.42	0.40
				SBIL		0.40	0.42	0.41
82211	M 85 from 6.90 to 7.07 (Sibley Rd, 6.91) City of Riverview	38	32	NBOL	Bit	0.39	0.40	0.40
				NBIL		0.42	0.43	0.42
				SBOL		0.42	0.46	0.43
				SBIL		0.44	0.47	0.45
82211	M 85 from 7.64 to 7.84 (Calvin, 7.71) City of Riverview	35	34	NBOL	Bit	0.39	0.41	0.40
				NBIL		0.47	0.49	0.48
				SBOL		0.41	0.42	0.41
				SBIL		0.46	0.48	0.47
82211	M 85 from 8.71 to 8.91 (Leroy St, 8.71; Orchard St, 8.90) City of Southgate	34	32	NBOL	Bit	0.30	0.31	0.31
				NBIL		0.39	0.41	0.40
				SBOL		0.15	0.25	0.20
				SBIL		0.36	0.38	0.37
82211	M 85 from 10.94 to 11.13 (Ford Blvd, 11.00) City of Lincoln Park	32	38	NBOL	Bit	0.37	0.38	0.38
				NBCL		0.37	0.41	0.39
				NBIL		0.43	0.46	0.45
				SBOL		0.35	0.39	0.37
				SBCL		0.42	0.46	0.43
				SBIL		0.38	0.38	0.38
82211	M 85 from 12.26 to 12.46 (Lincoln Blvd, 12.26) City of Lincoln Park	62	37	NBOL	Bit	0.34	0.36	0.35
				NBCL		0.41	0.47	0.44
				NBIL		0.39	0.42	0.41
				SBOL		0.36	0.38	0.37
				SBCL		0.40	0.41	0.41
				SBIL		0.41	0.45	0.44

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 22, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on US-223 BR at the curve at Williams Street, City of Adrian, Lenawee County
Research Project 54 G-74 - 73 SR-1

Skid tests have been conducted at subject location, in response to a request dated November 21, 1972 from L. J. Doyle. Wsf values ranging from 0.34 to 0.54 and averaging 0.41 were determined from 30 skid tests in this area on May 17, 1973. A few pertinent facts about this location include:

1. The prevailing speed is 35 mph.
2. Eastbound US-223 BR is downgrade to a point within the curve.
3. Williams Street traffic flows into the curve area at a stop sign.
4. The two eastbound lanes transition to one lane, without painted lane designations, as traffic negotiates the curve.
5. A center "left turn only" lane could put a stopped vehicle in the area where eastbound traffic is making the two-lane to one-lane transition.

Attached is a diagram illustrating curve area layout and the May 17 wsf values.

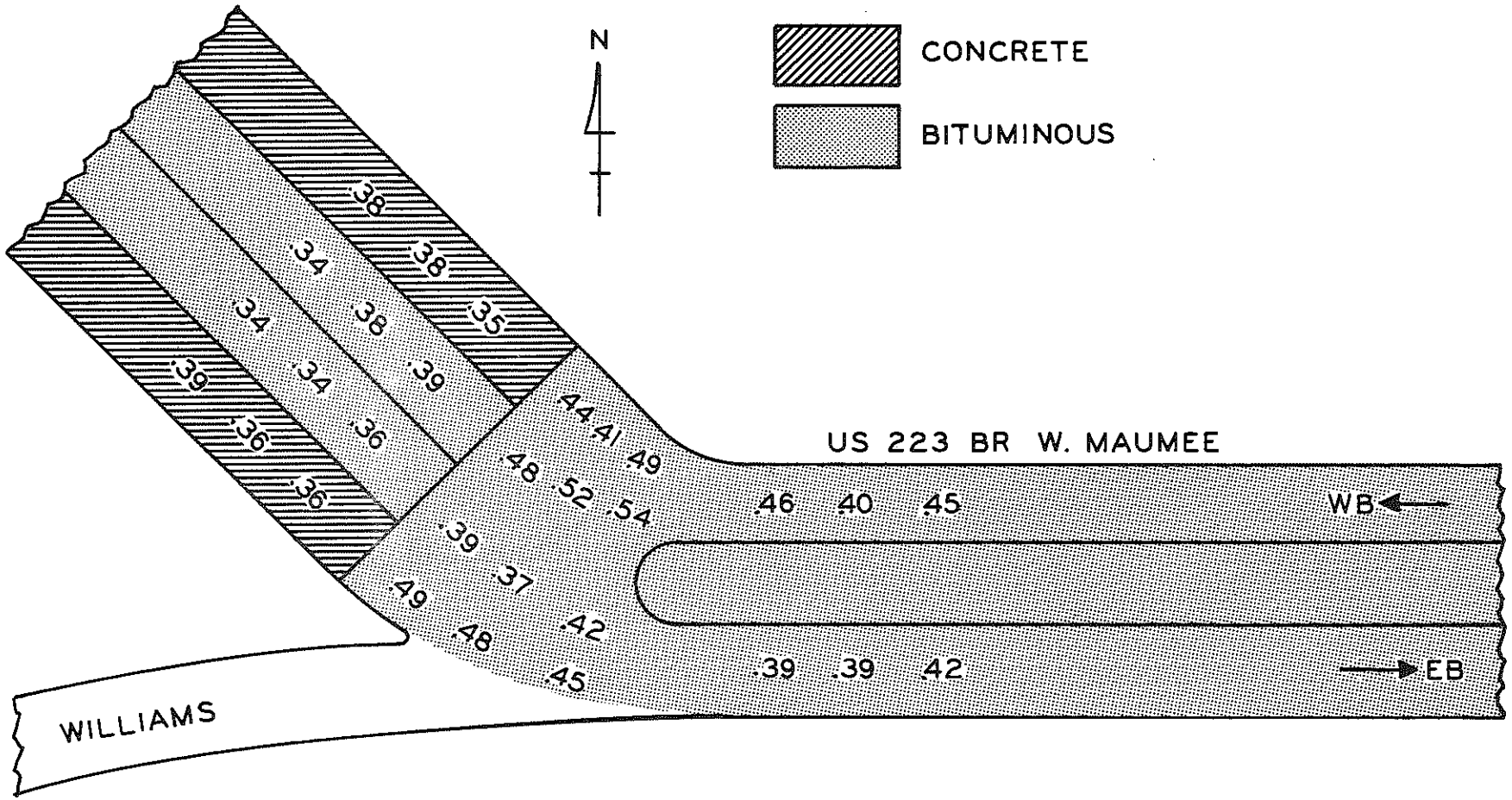
TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineeer of Research

LTO:PMS:bf
Attachment

cc: H. H. Cooper
L. J. Doyle
J. P. Neve, Jr.


N
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BITUMINOUS
US 223 BR W. MAUMEE
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OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

January 25, 1973

To: L. J. Cook
Assistant to Engineer of Soils

From: F. Copple

Subject: Skid Tests on I 94 from Telegraph Rd east to Wyoming, Wayne County. Research Project 54 G-74, 73 SR-2.

In response to your verbal request on December 8, 1972, skid testing was conducted January 22, 1973 on the subject I 94 roadway. Summarized in the attachment are ranges and averages of these 40 mph wet sliding skid tests for your review.

Skid coefficients are usually somewhat greater in winter and early spring than at other times of the year.

TESTING AND RESEARCH DIVISION

F. Copple

Supervisor, Pavement Performance Group

FC:PL:bf

73 SR-2 SKID TEST SUMMARY

I 94 from Telegraph Rd E to Wyoming
Tested 1/22/73 at Air and Pav't Temp of 44° F

Location	Surface Type	Constr. Year	Lane Tested	Coeff of wsf		
				Low	High	Avg.
Telegraph Rd (US 24) E to W of Monroe Rd	Bit Conc	1966	EBOL	.40	.42	.41
			EBCL	.42	.44	.43
			EBIL	.65	.66	.65
			WBOL	.53	.55	.54
			WBCL	.64	.66	.65
			WBIL	.69	.71	.70
W of Monroe Rd E to Pelham Rd	Bit Conc	1958	EBOL	.53	.55	.54
			EBCL	.54	.55	.54
			EBIL	.56	.60	.58
			WBOL	.55	.58	.56
			WBCL	.56	.59	.58
			WBIL	.58	.60	.59
Pelham Rd E to Outer Dr	Bit Conc	1958	EBOL	.52	.55	.53
			EBCL	.51	.56	.54
			EBIL	.58	.60	.59
			WBOL	.55	.55	.55
			WBCL	.55	.58	.57
			WBIL	.60	.60	.60
Outer Dr E to the River Rouge	Bit Conc	1958	EBOL	.51	.53	.52
			EBCL	.55	.58	.56
			EBIL	.60	.65	.62
			WBOL	.54	.55	.55
			WBCL	.54	.57	.56
			WBIL	.60	.62	.61
The River Rouge E to Greenfield Ave	Bit Conc	1971	EBOL	.51	.53	.52
			EBCL	.56	.57	.57
			EBIL	.63	.64	.64
			WBOL	.54	.57	.55
			WBCL	.57	.60	.58
			WBIL	.66	.70	.68
Greenfield Ave E to Wyoming	Bit Conc	1958	EBOL	.51	.54	.52
			EBCL	.53	.55	.54
			EBIL	.61	.62	.62
			WBOL	.50	.53	.51
			WBCL	.51	.54	.53
			WBIL	.58	.58	.59

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

February 1, 1973

To: J. P. Woodford
State Highway Director

From: Max N. Clyde

Subject: Investigation of Bridge B11 of 52032, Carrying M-35 over the Middle Branch of the Escanaba River, Northwest of Gwinn, Forsyth Township, Marquette County. Research Project 54 G-74, 73 SR-3

In response to your letter dated December 26, 1972 to Mr. Joseph DeJuliannie, Supervisor of Forsyth Township, the Research Laboratory has investigated the M-35 bridge in Forsyth Township.

The bridge lies in a rural area close to the west limits of the village of Gwinn. All surface water drains to the inside of the superelevated deck which lies on the PC of a horizontal curve. Traffic appeared to cross the deck at highway speeds.

Skid test coefficients measured on January 17, 1973, averaged 0.39 and ranged from 0.35 to 0.43. Those coefficients do not indicate a slippery condition. However, because of the effects of temperature and season, skid coefficients would probably be somewhat lower in summer and fall.

Police records showed only one wet sliding accident on the bridge in 1971 and none during the first six months of 1972. When questioned, Mr. DeJuliannie said that he had driven over the wet bridge deck in response to a complaint from Mrs. Ann Bussone and, in his pickup truck, the deck had "felt" slippery.

The operator of a nearby service station told Research Laboratory personnel that three cars had spun out of control while crossing the bridge deck a few weeks before skid tests were made. However, in that case the deck was said to have iced over while the approaches were clear.

Based upon available evidence, there appears to be no justification for installing a "Slippery When Wet" sign. However, the deck will be skid tested again next summer when coefficients may be lower. A sign warning of early bridge deck icing may be helpful and consideration could be given to moving the regulatory speed signs for the Village of Gwinn to include the bridge.

TESTING AND RESEARCH DIVISION

Max N. Clyde

Engineer of Testing and Research

MNC:FC:bf

cc: H. H. Cooper
L. T. Oehler

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 14, 1973

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

From: L. T. Oehler

Subject: Follow-up Skid Tests on Bridge B11 of 52032 Carrying M 35 over Middle Branch of the Escanaba River.
Research Project 54 G-74, 73 SR-3A.

Skid tests were conducted January 17, 1973 on subject bridge, located northwest of Gwinn in Marquette County. Coefficients ranged from 0.35 to 0.43 and averaged 0.39. These were reported to J. P. Woodford in a letter dated February 1, 1973.

Because of the effects of temperature and season, it was suspected that January test results might be slightly higher than those determined during a season other than winter or early spring. Therefore, additional skid tests were conducted on this structure June 20, 1973. Wsf values determined on the re-tests exhibited a range of 0.28 to 0.35 and an average of 0.31.

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:bf

cc: J. P. Woodford
M. N. Clyde

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 16, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on US 31 BR at Laketon St, City of Muskegon, Muskegon County. Research Project 54 G-74, 73 SR-4

In accord with a January 3, 1973 request from H. H. Cooper, skid tests have been conducted at the intersection of US 31 BR and Laketon Street in the City of Muskegon. The 48 tests, conducted May 14, 1973, at this intersection yielded wsf values ranging from 0.31 to 0.45 and averaging 0.37. Tests conducted in the 500-ft area approaching the intersection had friction levels ranging 0.33 to 0.45 and averaging 0.39. A 300-ft area leaving the intersection yielded a coefficient range of 0.35 to 0.40 with an average of 0.38. Lowest friction levels were determined within the intersection area where coefficients ranged from 0.31 to 0.36 and averaged 0.34.

Friction values given on the attached form, which you provided, each represent averages from three individual tests.

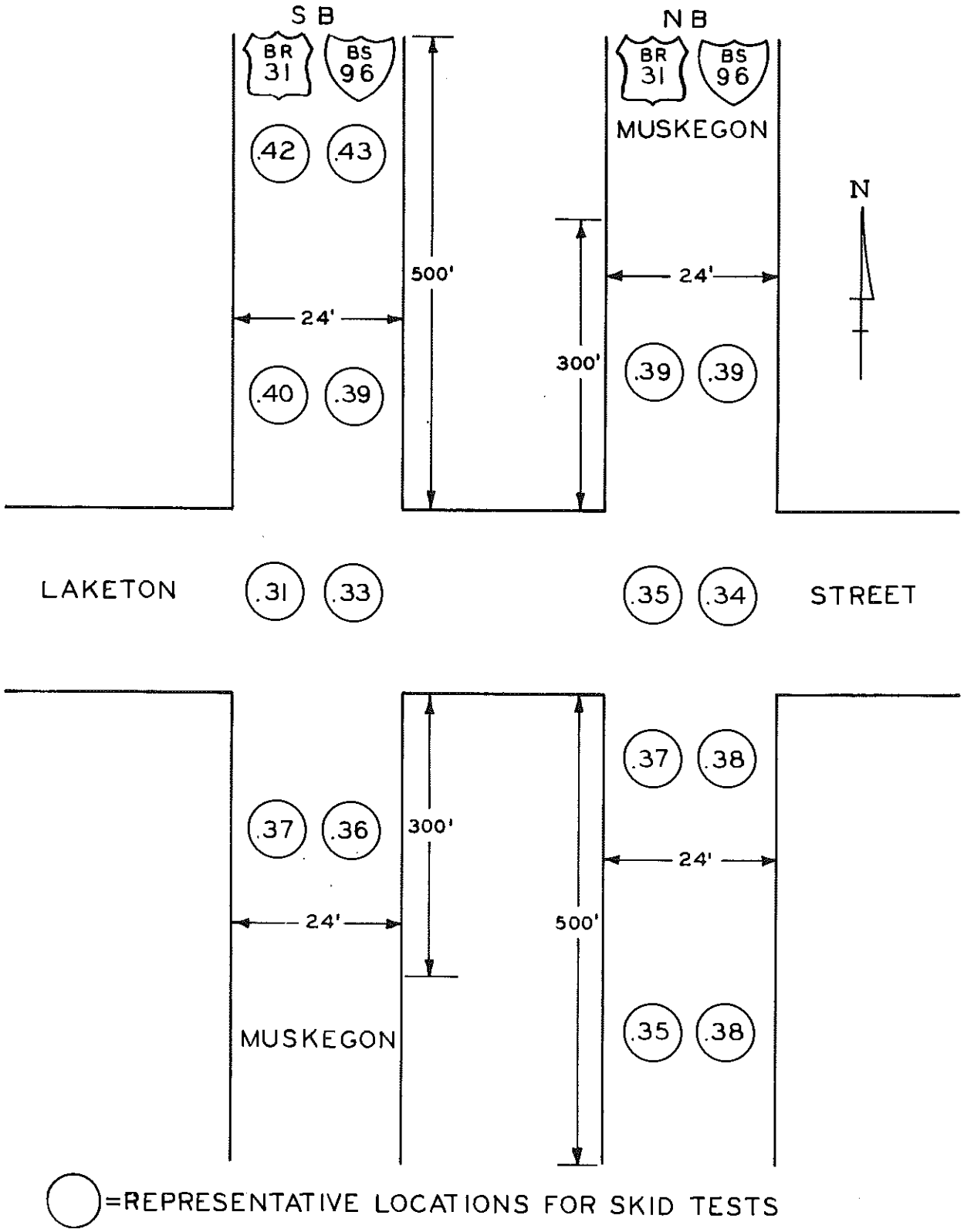
TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: H. H. Cooper
M. L. Jones



US 31 BR, BS 96 @ Laketon St
City of Muskegon
Muskegon County

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 25, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on M 50, East of Charlotte, from I 69-US 27 Easterly to NYCRR
Research Project 54 G-74, 73 SR-5

In accord with a February 7, 1973 request from L. J. Doyle, skid tests have been conducted at the subject M 50 location. Wsf values were obtained at intervals of 500 ft throughout this 1.36 mile section on May 17. Friction levels ranged from 0.23 to 0.55 and averaged 0.40. An intermittently flushed surface prevails throughout the area tested; most of it in the eastbound lane. Wsf values and their respective milepost descriptions are included as an attachment.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: H. H. Cooper
L. J. Doyle
J. F. Oravec
J. Badaluco
D. C. Rush
E. H. Miller

M 50 SKID TEST RESULTS CONDUCTED
MAY 17, 1973
(Control Section 23051)

Milepost	Coefficient of Wsf	
	Westbound	Eastbound
2.09	0.52	0.51
1.99	0.55	0.55
1.90	0.49	0.37
1.80	0.53	0.34
1.71	0.42	0.27
1.61	0.40	0.44
1.52	0.45	0.23
1.42	0.46	0.35
1.33	0.43	0.28
1.23	0.40	0.33
1.14	0.45	0.31
1.04	0.45	0.34
0.95	0.26	0.39
0.85	0.31	0.48

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

June 11, 1973

To: M. N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests at Seven General Locations
Research Project 54 G-74, 73 SR-6

In accord with an April 3, 1973 request from Mr. H. H. Cooper, skid tests have been completed at the seven areas of interest. Tests were conducted between May 22 and 24, 1973. Results are included on the attached table.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

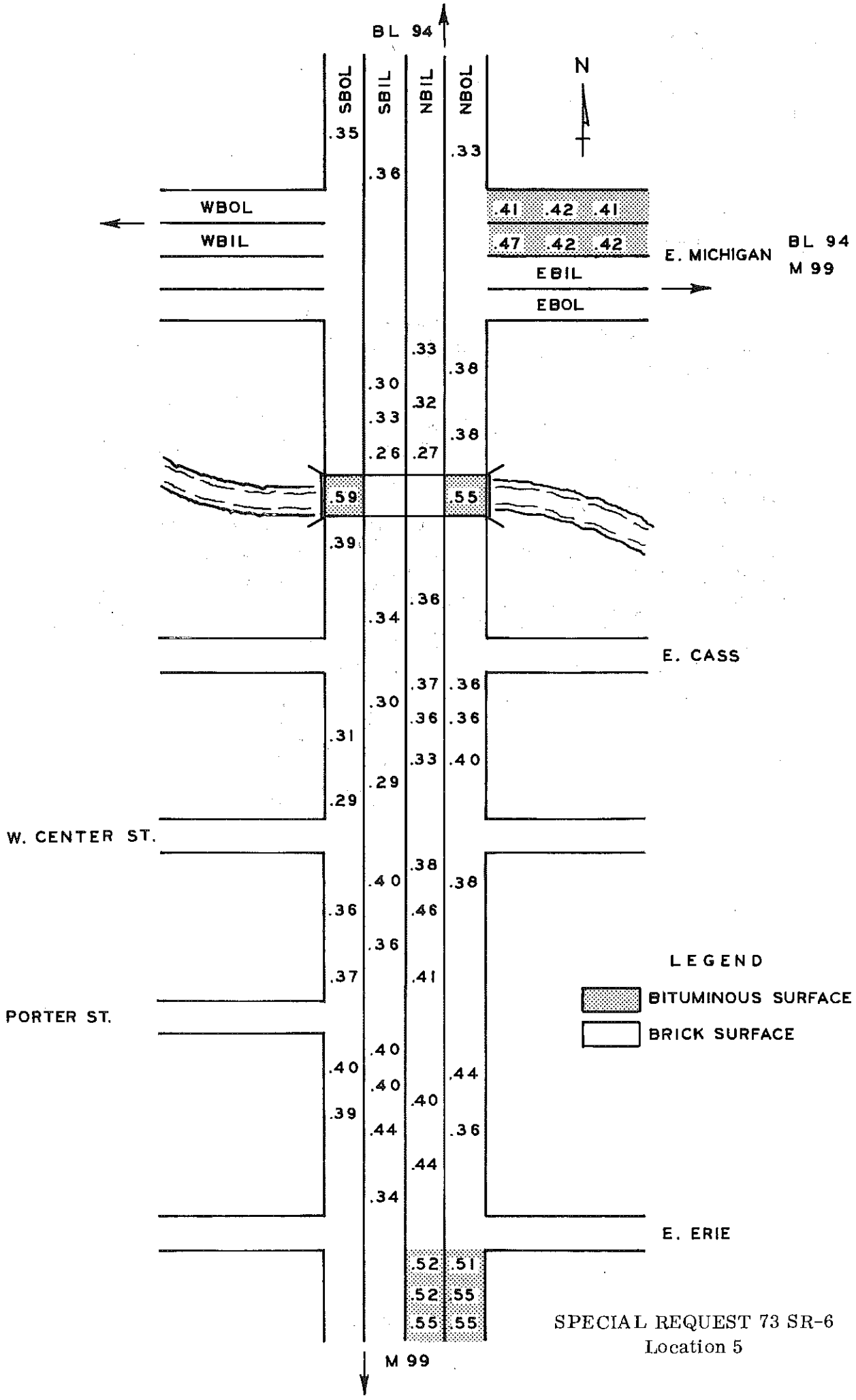
LTO:PMS:bf
Attachment

cc: H. H. Cooper
M. L. Jones
E. H. Miller
P. J. Riley

Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
1) M 21 @ Johnson Rd., W of Ionia	Bit	EB	0.29	0.31	0.30
	Bit	WB	0.29	0.35	0.31
M 21 in curve area W of Johnson Rd	Bit	EB	0.32	0.35	0.33
	Bit	WB	0.33	0.38	0.36
2) On US 31 exit ramp to Laketon Ave., City of Muskegon	Bit	NB	0.30	0.34	0.32
	Bit	SB	0.28	0.33	0.30
Stopping area on US 31 exit ramp to Laketon Ave.	Bit	NB	0.30	0.30	0.30
	Bit	SB	0.29	0.30	0.30
US 31 N from Laketon Ave.	Conc	NBOL	0.42	0.43	0.43
	Conc	NBIL	0.44	0.47	0.46
	Conc	SBOL	0.45	0.47	0.46
	Conc	SBIL	0.48	0.53	0.51
US 31 @ Apple Ave., City of Muskegon	Conc	NBOL	0.38	0.42	0.41
	Conc	NBIL	0.43	0.45	0.44
	Conc	SBOL	0.46	0.48	0.47
	Conc	SBIL	0.51	0.53	0.52
US 31 N from Marquette Ave., City of Muskegon	Bit	NBOL	0.45	0.45	0.45
	Bit	NBIL	0.51	0.53	0.52
	Bit	SBOL	0.44	0.48	0.47
	Bit	SBIL	0.56	0.60	0.58
US 31 between Muskegon River and Cedar Creek, City of Muskegon	Conc	NBOL	0.47	0.47	0.47
	Conc	NBCL	0.52	0.53	0.52
	Conc	NBIL	0.64	0.66	0.65
	Conc	SBOL	0.53	0.54	0.54
	Conc	SBCL	0.51	0.52	0.52
	Conc	SBIL	0.62	0.64	0.63
On US 31 exit ramp to M 120, N of Muskegon	Bit	NB	0.51	0.55	0.52
	Bit	SB	0.69	0.69	0.69
Stopping area on US 31 exit ramp to M 120	Bit	NB	0.34	0.37	0.36
	Bit	SB	0.51	0.52	0.51
3) M 37 N from Bridge St., City of Newaygo	Conc	NBOL	0.31	0.34	0.32
	Conc	NBIL	0.34	0.39	0.36
	Conc	SBOL	0.28	0.30	0.29
	Conc	SBIL	0.32	0.36	0.34
M 37 S of Bridge St. (curve on hill)	Conc	NBOL	0.30	0.31	0.30
	Conc	NBIL	0.33	0.35	0.34
	Conc	SBOL	0.33	0.38	0.35
	Conc	SBIL	0.38	0.41	0.40

Location	Surface Type	Lane	Coefficient of Wsf		
			Low	High	Avg
4) US 31 from Bascule Bridge N to Ridge Rd., City of Grand Haven	Conc	NBOL	0.39	0.44	0.42
	Conc	NBIL	0.41	0.43	0.42
	Bit	NBOL	0.49	0.50	0.50
	Bit	NBIL	0.62	0.66	0.64
	Bit	SBOL	0.48	0.50	0.49
	Bit	SBIL	0.64	0.65	0.65
SB US 31 at Gore area at the 3rd St. exit ramp, City of Ferrysburg	Conc	SBOL	0.42	0.46	0.44
	Conc	SBIL	0.45	0.47	0.46
	Bit	SBOL	0.44	0.48	0.46
	Bit	SBIL	0.65	0.67	0.66
5) M 99 from Erie to BL 94, City of Albion	See Attached Map				
6) BR 131-BL 94 @ Lovell St., City of Kalamazoo	Bit	EBOL*	0.36	0.36	0.36
	Bit	EBIL*	0.35	0.36	0.36
	Bit	WBOL	0.34	0.34	0.34
	Bit	WBIL	0.39	0.42	0.41
BR 131-BL 94 @ South St., City of Kalamazoo	Bit	EBOL	0.33	0.35	0.34
	Bit	EBIL	0.31	0.34	0.33
	Bit	WBOL	0.37	0.42	0.39
	Bit	WBIL	0.38	0.39	0.38
BR 131-BL 94 @ Academy St., City of Kalamazoo	Bit	EBOL	0.35	0.37	0.36
	Bit	EBCL	0.37	0.41	0.39
	Bit	EBIL	0.35	0.41	0.38
	Bit	WBOL	0.37	0.37	0.37
	Bit	WBCL	0.35	0.37	0.36
	Bit	WBIL	0.34	0.37	0.36
7) M 53 @ 12 Mile Rd., City of Warren	Bit	NBOL	0.41	0.43	0.42
	Bit	NBCL	0.40	0.41	0.41
	Bit	NBIL	0.47	0.49	0.48
	Bit	SBOL	0.47	0.48	0.47
	Bit	SBCL	0.42	0.45	0.44
	Bit	SBIL	0.44	0.50	0.47
8) M 97 @ 12 Mile Rd., City of Roseville	Bit	NBRT	0.45	0.48	0.47
	Bit	NBOL	0.38	0.40	0.39
	Bit	NBIL	0.42	0.43	0.42
	Bit	SBRT	0.41	0.44	0.43
	Bit	SBOL	0.39	0.41	0.40
	Bit	SBIL	0.41	0.45	0.42

*EBOL and EBIL also has a newer Bit Surface which yielded wsf values of 0.51 and 0.48, respectively.



SPECIAL REQUEST 73 SR-6
Location 5

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 15, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on US-31, South of Filmore Road, Hart Twp., Oceana County. Research Project 54 G-74 - 73 SR-7

In accord with a May 1, 1973 request from H. H. Cooper, skid tests have been conducted in and out of wheel tracks, at the subject location. A bituminous concrete and a sand asphalt surface was tested May 10, 1973. Wet sliding friction values determined in the wheel tracks ranged from 0.55 to 0.61 and averaged 0.59 on the bituminous concrete portion. Tests conducted in the same area but outside the wheel tracks ranged from 0.61 to 0.64 and averaged 0.62. Wheel track values ranging from 0.58 to 0.70 and averaging 0.64 were found on the sand asphalt surface near Filmore Road. Adjacent to wheel track tests varied from 0.61 to 0.72 and averaged 0.67. Neither in or out of wheel track wsf values are indicative of an area which is slippery when wet. Attached is a sketch of the area for your review.

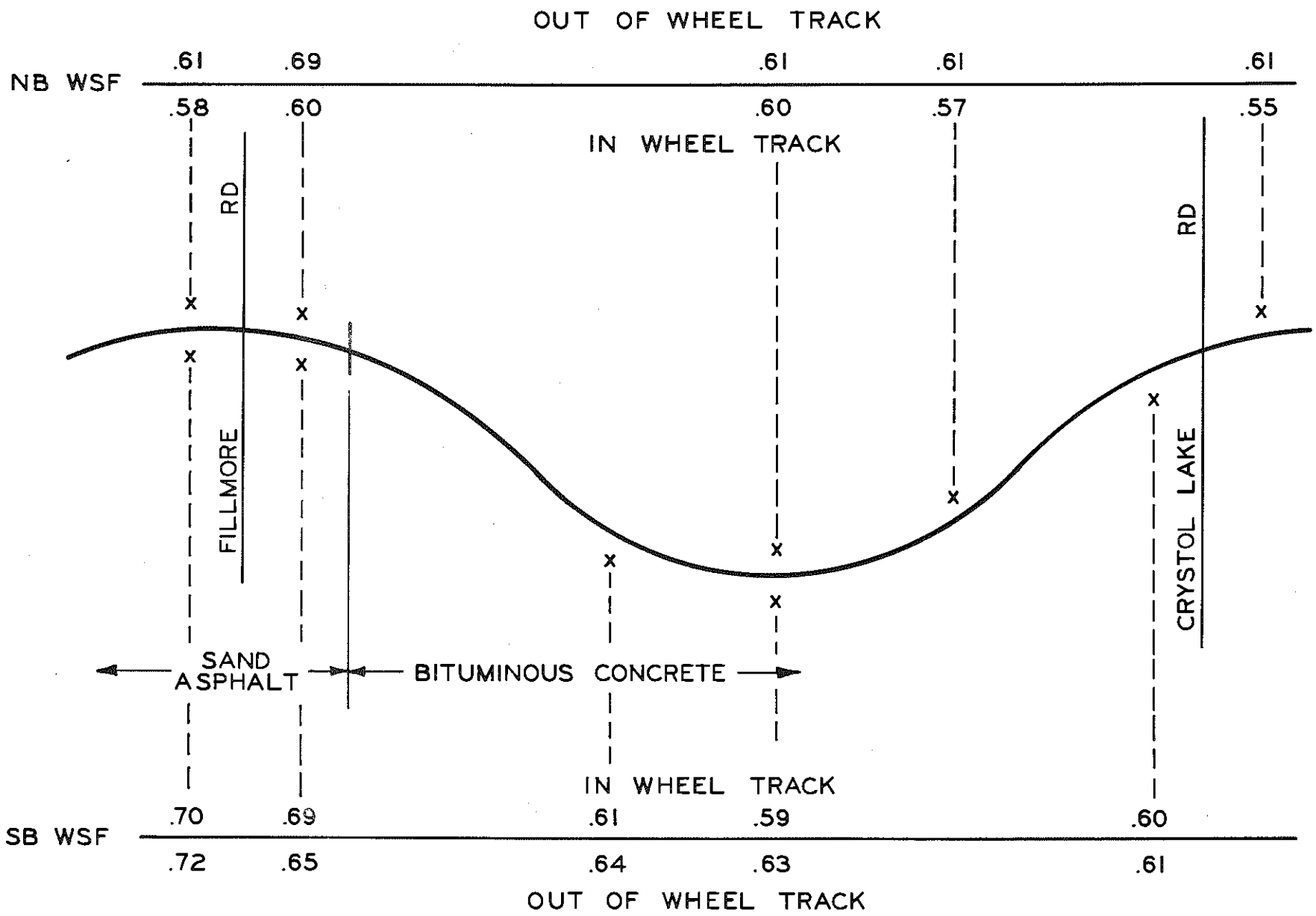
TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf
Attachment

cc: H. H. Cooper
M. L. Jones



RES PROJ 54 G-74
73 SR - 7

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 25, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Priority Skid Tests on US-27 at Waverly Road, Eaton and Ingham Counties - Research Project 54 G-74 - 73 SR-8

In accord with a priority request from H. H. Cooper dated May 14, 1973, skid tests were conducted in the stopping areas of US-27 at Waverly Road (Ingham-Eaton County Line). Wsf values determined May 14 ranged from 0.25 to 0.35 and averaged 0.29. Friction levels in their respective stopping areas are:

Lane	Coefficient of WSF		
	Low	High	Average
EBOL	0.27	0.30	0.28
EBIL	0.25	0.26	0.25
WBOL	0.26	0.29	0.28
WBIL	0.31	0.35	0.34

At the time of testing (about noon), the traffic signal for US-27 traffic at Waverly was timed approximately 55 seconds red and 25 seconds green. The relatively short duration of the green light for M-78 traffic might cause many stops of high deceleration rates.

All above information has been relayed via phone, as requested, to the Surveillance Unit on May 16, 1973.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: H. H. Cooper
E. H. Miller

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

June 13, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests at Two Berrien County Locations
Research Project 54 G-74, 73 SR-9

In accord with a May 10, 1973 request from H. H. Cooper, skid tests have been conducted at two Berrien County locations. Attached are two figures which show results and locations of tests conducted May 23, 1973.

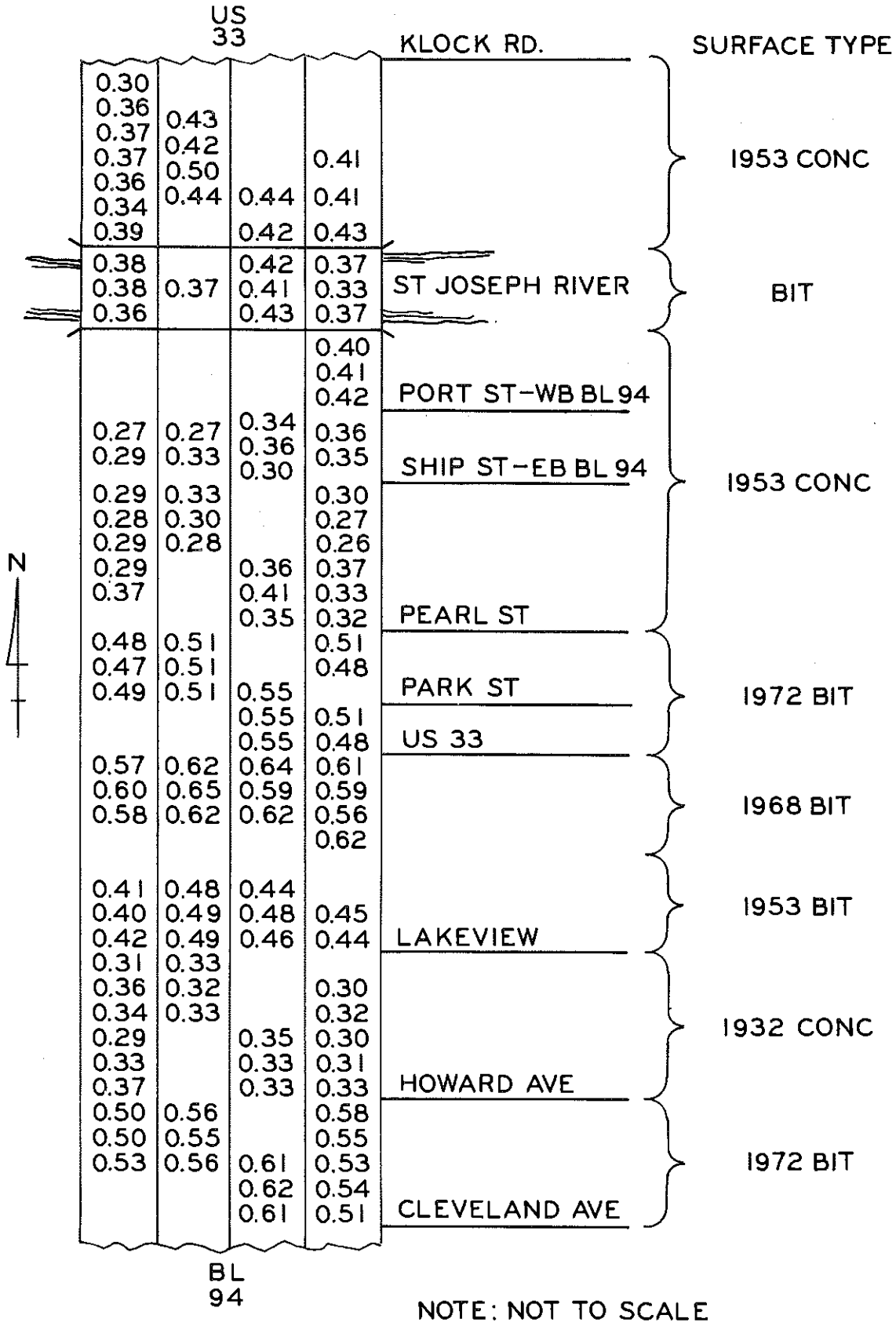
TESTING AND RESEARCH DIVISION

L. T. Oehler

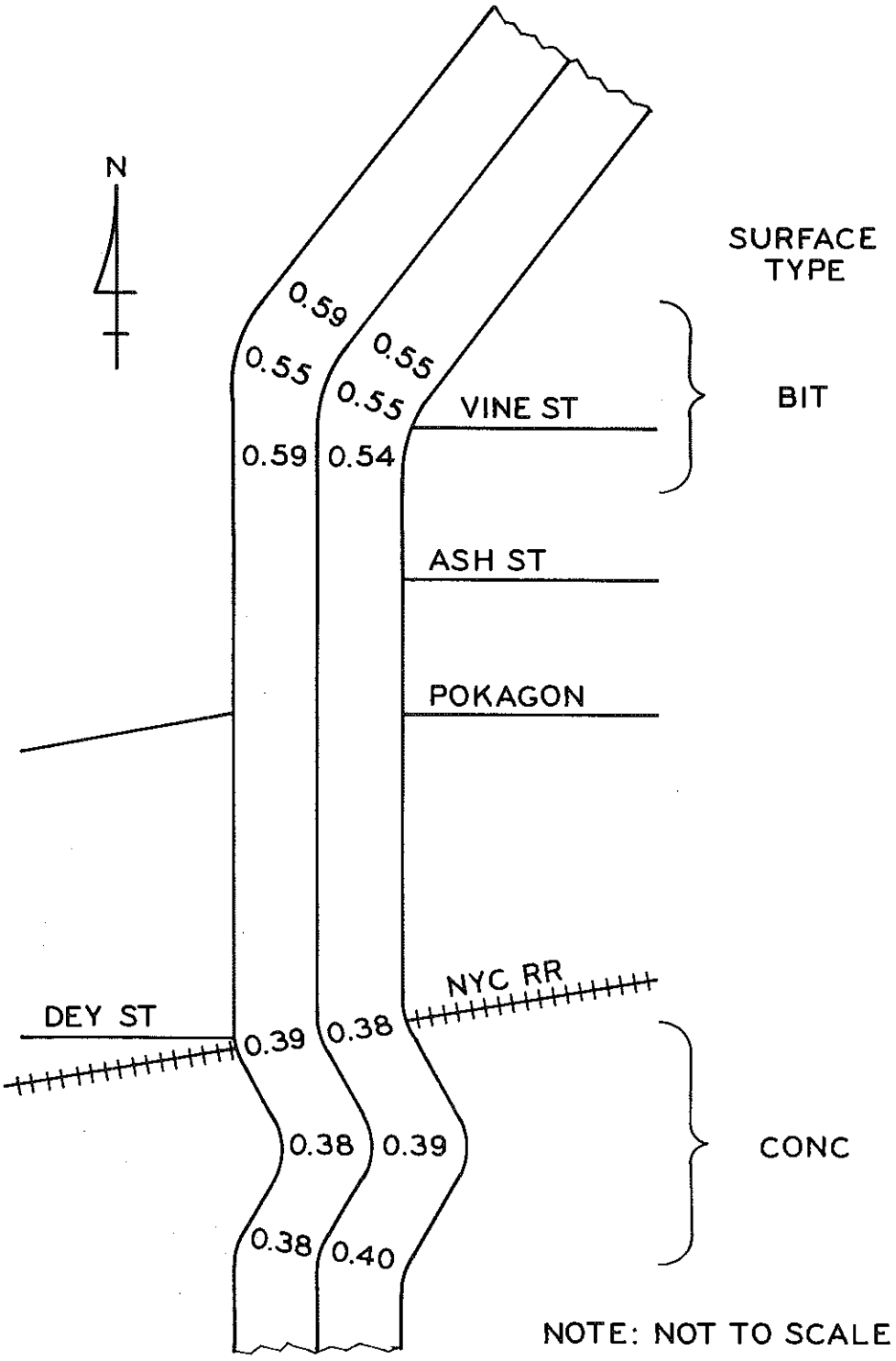
Engineer of Research

LTO:PMS:bf
Attachment

cc: H. H. Cooper
E. H. Miller



NOTE: NOT TO SCALE


N
SURFACE TYPE
0.59
0.55
0.55
0.55
VINE ST
BIT
0.59
0.54
ASH ST
POKAGON
NYC RR
DEY ST
0.39
0.38
0.38
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CONC
0.38
0.40
NOTE: NOT TO SCALE

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 30, 1973

To: John P. Woodford
State Highway Director

From: Max N. Clyde

Subject: Skid Tests on M-78 at M-52, Shiawassee County
Research Project 54 G-74, 73 SR-10

In response to your May 21, 1973 inquiry, skid tests were conducted at the subject location on May 25, 1973. Coefficients ranging from 0.28 to 0.62 and averaging 0.43 were determined. The poorest friction level performance was found in the area you mentioned, on the eastbound passing lane approaching the M-52 intersection, where coefficients ranged from 0.28 to 0.33 and averaged 0.30. A breakdown of skid tests are shown below, for your review.

Location of Test	Surface Type	Lane	Coefficient of Wsf Low	High	Avg.
M-78, 0.25 mile W. of M-52	Conc	EBOL	0.36	0.39	0.38
	Conc	EBIL	0.36	0.37	0.36
M-78 Stopping Area at M-52	Conc	EBOL	0.30	0.32	0.31
	Conc	EBIL	0.28	0.33	0.30
	Bit	WBOL	0.46	0.50	0.47
	Bit	WBIL	0.58	0.62	0.60
M-78, 0.25 mile E. of M-52	Bit	WBOL	0.42	0.49	0.46
	Bit	WBIL	0.48	0.59	0.54

TESTING AND RESEARCH DIVISION

Max N. Clyde

Engineer of Testing and Research

MNC:PMS:bf

cc: N. C. Jones
J. F. Oravec
H. H. Cooper
L. T. Oehler
L. J. Mikulich

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

June 13, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on Brick Bridge Deck, Wayne County
Research Project 54 G-74, 73 SR-11

In accord with a May 16, 1973 request from Mr. B. A. Ross, skid tests have been conducted on the 35 year old brick surfaced West Road bridge deck.

No lane designations exist on this deck. Our field personnel observed some of the traffic straddled the outside and inside lanes when crossing this structure. For this reason astride wheel track (AWT) tests were also conducted at this location. Results are shown below:

Lane Designation	Coefficient of Wsf		
	Low	High	Avg.
EBOL	0.36	0.38	0.37
EBIL	0.44	0.49	0.47
EB AWT	0.46	0.50	0.48
WBOL	0.38	0.41	0.39
WBIL	0.45	0.48	0.47
WB AWT	0.45	0.49	0.47

Skid tests were also conducted on this structure during 1970. Average wsf values determined then were:

EBOL	0.48
EBIL	0.48
WBOL	0.42
WBIL	0.47

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: B. A. Ross

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

June 15, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on 2 surfacing projects located in Wexford and Missaukee Counties. Research Project 54 G-74, 73 SR-12.

In accord with a teletype request from P. J. Serafin, skid tests have been conducted at subject locations. Approximately one mile of US 131, through the Village of Manton in Wexford County, was tested June 5, 1973. Wsf values ranged from 0.21 to 0.50 and averaged 0.38. A uniform surface texture was apparent on the outside lanes while the inside lanes exhibit a wide range of friction levels. Below is a breakdown of test data.

Lane	Coefficient of Wsf		
	Low	High	Avg.
NBOL	0.43	0.49	0.45
NBIL	0.27	0.41	0.36
SBOL	0.44	0.50	0.46
SBIL	0.21	0.45	0.33

The other location, M 66 from M 42 north approximately 6 miles in Missaukee County was also tested on June 5. Coefficients of wsf ranged from 0.21 to 0.54 and averaged 0.45. Only three isolated tests, representing a relatively small area, had friction levels below the 0.40 mark; all of these occurred on the northbound lanes. A summary of these data are shown below.

Lane	Coefficient of Wsf		
	Low	High	Avg.
NB	0.21	0.54	0.45
SB	0.42	0.52	0.47

The above data were transmitted via phone, as requested, to Paul Serafin on June 11, 1973.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: P. J. Serafin

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

June 13, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on Spray Grip Surface, US-24 at 10 Mile Road, Oakland Co. Research Project 54 G-74, 73 SR-13 and Research Project 72 NM-322

In accord with a June 7, 1973 request from P. J. Serafin, skid tests have been conducted on the Spray Grip surface located at the intersection of US-24 and 10 Mile Road. Wsf values ranging from 0.63 to 0.70 and averaging 0.68 were determined on this surface June 10, 1973. Attached is a historical review of coefficients of wsf at this location.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf
Attachment

cc: H. H. Cooper
A. Chritz
D. E. Orne
New Materials Committee

SPRAY GRIP SURFACE

Test Location	Lane	Before Spray Grip			After Spray Grip					
		9-19-72 Coefficient of Wsf			11-2-72 Coefficient of Wsf			6-10-73 Coefficient of Wsf		
		Low	High	Avg	Low	High	Avg	Low	High	Avg
US 24 (Telegraph Road), Immediately North of 10 Mile Road	SBRT	0.31	0.36	0.34	0.79	0.79	0.79	0.67	0.70	0.69
	SBOL	0.37	0.38	0.37	0.73	0.79	0.77	0.63	0.69	0.66
	SB#3	0.33	0.34	0.33	0.78	0.79	0.79	0.69	0.69	0.69
	SB#2	0.33	0.36	0.34	0.76	0.79	0.78	0.66	0.67	0.66
	SBIL	0.34	0.37	0.36	0.78	0.79	0.79	0.64	0.69	0.66
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

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

July 10, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on I 96 throughout Ottawa County.
Research Project 54 G-74, 73 SR-14

In accord with a June 26, 1973 request from M. Rothstein, skid tests have been conducted on the Ottawa County section of I 96. Results of tests conducted June 27, 1973 are shown on attached sheets, by project, in an east to west direction across Ottawa County.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research
Research Laboratory Section

LTO:PMS:bf

cc: D. C. Rush
M. Rothstein

Project No.	Location	Surface Type	Direction and Lane	Coefficient of Wet Sliding Friction		
				Low	High	Avg
70063, C10	I 96 from Ottawa-Kent Co. Line to W of M 11	Conc	EBOL	0.43	0.45	0.44
			EBIL	0.46	0.50	0.48
			WBOL	0.42	0.45	0.43
			WBIL	0.49	0.51	0.50
70063, C3	From W of M 11 W to 1 mile E of 48th Street	Conc	EBOL	0.44	0.47	0.46
			EBIL	0.48	0.53	0.50
			WBOL	0.44	0.47	0.46
			WBIL	0.44	0.49	0.46
70063, C1	From 1 mile E of 48th Street W to 48th Street	Conc	EBOL	0.45	0.48	0.46
			EBIL	0.48	0.53	0.50
			WBOL	0.44	0.45	0.45
			WBIL	0.42	0.45	0.43
70063, C2	From 48th Street W to 0.5 mile E of 68th Street	Conc	EBOL	0.42	0.46	0.43
			EBIL	0.49	0.50	0.50
			WBOL	0.45	0.47	0.46
			WBIL	0.46	0.50	0.49
70063, C1	From 0.5 mile E of 68th Street W to 0.5 mile W of 68th Street	Conc	EBOL	0.42	0.45	0.43
			EBIL	0.45	0.48	0.46
			WBOL	0.47	0.49	0.48
			WBIL	0.50	0.55	0.52
70063, C8	From 0.5 mile W of 68th Street, W to W of Crockery Creek	Bit	EBOL	0.60	0.61	0.61
			EBIL	0.69	0.71	0.70
			WBOL	0.55	0.56	0.55
			WBIL	0.65	0.69	0.68
70063, C6	From W of Crockery Creek W to M 104	Bit	EBOL	0.51	0.53	0.52
			EBIL	0.71	0.74	0.72
			WBOL	0.51	0.52	0.51
			WBIL	0.65	0.67	0.66

Project No.	Location	Surface Type	Direction and Lane	Coefficient of Wet Sliding Friction		
				Low	High	Avg
70064, C1	From M 104 W to W of Rest Area	Bit	EBOL	0.53	0.55	0.54
			EBIL	0.73	0.76	0.75
			WBOL	0.59	0.60	0.60
			WBIL	0.75	0.78	0.76
70064, C3	From W of Rest Area W to Ottawa-Muskegon	Bit	EBOL	0.55	0.57	0.56
	County Line		EBIL	0.75	0.76	0.75
			WBOL	0.54	0.56	0.55
			WBIL	0.76	0.78	0.77

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

July 10, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on Northeastbound M 78 - US 27 from Packard Road to Bituminous Crossover at the Maple Knoll Trailer Park.
Research Project 54 G-74, 73 SR-15

In accord with a June 25, 1973 request from L. J. Doyle, skid tests have been conducted at subject location. The Northeastbound outside lane yielded wsf values ranging from 0.33 to 0.40 and averaging 0.37. The inside lane, same direction, had values ranging from 0.35 to 0.46, averaging 0.39. Skid tests were conducted July 3, 1973.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research
Research Laboratory Section

LTO:PMS:nag

cc: L. J. Doyle
E. H. Miller

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS

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

JOHN P. WOODFORD, STATE HIGHWAY DIRECTOR

August 3, 1973

Mr. Duane F. Dunlap, Research Engineer
Physical Factors Group
Highway Safety Research Institute
Huron Parkway and Baxter Road
Ann Arbor, Michigan 48105

Dear Mr. Dunlap:

Pavement Skid Resistance Measurements and
Information for Highway Safety Research Institute
Research Project 54 G-74, 73 SR-16

Enclosed are the available 40 mph wet sliding coefficient of friction values obtained at the I-75 location, in Troy, Michigan from Maple Road (15 Mile Road) to Big Beaver (16 Mile Road). These data were measured using the Department's two wheel lockup towed test trailer described in the attached report.

Test replications were not conducted for this specific data since all values were within established procedural limitations described in the attachment. The result of a late 1972 correlation study, conducted over a range of surface types and friction levels between our two skid testers, yielded an average standard deviation of .0193 for replications by this test instrument.

All testing is performed with the test tires centered in the wheel tracks of each lane utilizing ASTM E-249 test tires inflated to 24 psi. Wheel load during test is not actually measured but a correction for weight shift is applied to the digitizing package at the mid-friction range balance printout of 0.406. This correction is dependent upon hitch height and distance from axle centerline to hitch and is directly proportional to the frictional drag force.

Other information including water flow rates or depths are tabulated with the wsf values.

Very truly yours,

TESTING AND RESEARCH DIVISION

Max N. Clyde

-125- Max N. Clyde, P. E.
Engineer of Testing and Research

MICHIGAN
THE GREAT LAKE STATE

Location: I 75 from milepost 10.06 N'ly to 10.26 (16 Mile Rd = 10.26), City of Troy, Control Section 63174.
Test Date: 7-11-71
Air Temp (F): 63°
Static Axle Load: 1760 lb
Water Depth: .030
Surface Type: concrete

1971 SKID TEST SUMMARY

Direction and Lane	No. of Tests	Coefficient of Wet Sliding Friction		
		Low	High	Avg
NBOL	3	0.31	0.36	0.34
NBCL	3	0.36	0.38	0.37
NBIL	3	0.37	0.40	0.39
SBOL	3	0.34	0.35	0.34
SBCL	3	0.37	0.38	0.37
SBIL	3	0.41	0.44	0.43

Location: I 75 from Maple Rd N'ly through M 150 (Rochester Rd) Interchange, City of Troy. Station 1085 N'ly to Station 1160. Control Section 63174
Test Date: 11-3-72
Air Temp (F): 42°
Static Axle Load: 1825 lb
Water Depth: .020 in.
Surface Type: concrete

1972 SKID TEST SUMMARY

Test Location Stationing	Coefficient of Wet Sliding Friction — Test Direction and Lane					
	SBOL	SBCL	SBIL	NBIL	NBCL	NBOL
1085+00	0.34	0.40	0.45	0.45	0.43	0.37
1090+00	0.36	0.43	0.46	0.48	0.43	0.37
1095+00	0.38	0.47	0.47	0.47	0.46	0.38
1100+00	0.36	0.46	0.48	0.48	0.45	0.39
1105+00	0.36	0.43	0.46	0.48	0.45	0.36
1110+00	0.37	0.41	0.46	0.46	0.45	0.36
1115+00	0.37	0.42	0.43	0.47	0.44	0.35
1120+00	0.35	0.42	0.45	0.47	0.45	0.35
1125+00	0.37	0.41	0.46	0.48	0.44	0.34
1130+00	0.36	0.40	0.46	0.46	0.46	0.37
1135+00	0.36	0.40	0.44	0.49	0.46	0.37
1140+00	0.34	0.42	0.45	0.50	0.45	0.38
1145+00	0.36	0.43	0.48	0.50	0.46	0.38
1150+00	0.36	0.42	0.48	0.50	0.47	0.39
1155+00	0.39	0.46	0.50	0.50	0.49	0.39
1160+00	0.40	0.46	0.48	0.51	0.47	0.38

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

August 31, 1973

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

From: L. T. Oehler

Subject: Skid Tests on Bituminous Wearing Courses with Degradated Shale Particles. Research Project 54 G-74, 73 SR-17.

In response to a July 13, 1973 request from Max N. Clyde, skid tests have been conducted at three locations on US-131, M-66 and on South Boardman Road. The three locations were selected by Mr. D. E. Pennington. Exposed shale particles in the bituminous wearing courses at these sites have deteriorated leaving only open shale particle casts. Neither progressive deterioration of the casts or flowage of bituminous into the casts has occurred. Skid tests were conducted August 24, 1973 and resulting coefficients of wsf are shown below for your review.

Location	Direction and Lane	Coefficient of WSF Low	High	Avg.
On South Boardman Road from village of South Boardman east in Kalkaska County	EB	0.60	0.65	0.63
	WB	0.65	0.66	0.65
On M-66 from village of Lodi north (Control Section 40031)	NB	0.52	0.55	0.54
	SB	0.57	0.59	0.58
On US-131 at Elmire Hill (Control Section 05072, milepost 14.900)	NB	0.54	0.57	0.56
	SBPL	0.62	0.65	0.63
	SB*	0.57	0.59	0.58

(*) Truck Lane

TESTING AND RESEARCH DIVISION

Engineer of Research

LTO:MS:cgc

cc: M. N. Clyde
D. E. Orne
D. F. Malott
R.M. Hinkelman
D. E. Pennington

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

August 31, 1973

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

From: L. T. Oehler

Subject: Skid Tests of I 194 - M 66 from I 94 North to M 37 in Calhoun County. Research Project 54 G-74, 73 SR-18.

In accord with a request from L. J. Doyle, dated July 23, 1973 skid tests have been conducted at subject location. Wet sliding friction values ranging from 0.38 to 0.64 and averaging 0.48 were measured on August 23, 1973. Below for your review, skid test data are broken down into the five areas tested.

Location	Surface Type	Direction and Lane	Coefficient of Wsf Low	High	Avg
North of I 94	Conc	NBOL	0.48	0.50	0.49
	Conc	NBIL	0.59	0.64	0.61
	Conc	SBOL	0.41	0.45	0.43
	Conc	SBIL	0.52	0.54	0.53
North of Golden Ave.	Conc	NBOL	0.48	0.55	0.52
	Conc	NBIL	0.56	0.60	0.58
	Conc	SBOL	0.48	0.54	0.50
	Conc	SBIL	0.55	0.59	0.57
Curve Area at Kalamazoo River	Conc	NBOL	0.40	0.43	0.42
	Conc	NBCL	0.42	0.46	0.44
	Conc	NBIL	0.39	0.43	0.41
North of Kalamazoo River	Conc	SBOL	0.38	0.41	0.39
	Conc	SBIL	0.38	0.45	0.41
At M 37	Bit	NBOL	0.46	0.48	0.47
	Bit	NBIL	0.45	0.47	0.46
	Bit	SBOL	0.44	0.50	0.47
	Bit	SBIL	0.46	0.51	0.48

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:bf

cc: M. N. Clyde
E. H. Miller

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

August 31, 1973

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

From: L. T. Oehler

Subject: Skid Tests on Bituminous Sandstone Project Mb 46061-04845A.
Research Project 54 G-74, 73 SR-19.

In accord with a July 24, 1973 request from P. J. Serafin, skid tests have been conducted on Project Mb 46061-04845A, located on US 223 from US 127 SE'ly a distance of 10.63 miles. Five experimental blends of Napoleon Sandstone were placed July 16 and 17, 1973 on a 5,000 foot section at the southeast end of this project. The remaining 9.68 miles were constructed with a conventional bituminous aggregate 4.11 wearing course. Mr. Serafin, in his request letter requesting skid tests, mentioned "There has been some tracking of emulsion and traffic was allowed on some of the mat before sufficient cooling. This has resulted in slick areas at various locations on the entire project." Skid tests were conducted August 23, 1973 and verify Mr. Serafin's observations. Coefficients ranging from 0.30 to 0.55 and averaging 0.42 were determined on the Napoleon Sandstone mixes. The friction levels ranged from 0.20 to 0.42 and averaged 0.30 on the bituminous aggregate section. Breakdowns of the experimental section and the bituminous aggregate portion are attached for review and/or appropriate action. Additional skid tests will be conducted on this project later this fall and again next year.

TESTING AND RESEARCH DIVISION

Engineer of Research

LTO:PMS:bf

attachment

cc: D. E. Orne
P. J. Serafin
A. P. Chritz

Napoleon Sandstone Blends						
Mix No.	Blend No.	Station to Station	Direction	Coefficient of Wsf		
				Low	High	Avg
1	II	490+88 to 496+50	NB	0.34	0.38	0.36
2	II	486+50 to 490+88	NB	0.35	0.42	0.38
2	II	492+26 to 496+50	SB	0.50	0.55	0.53
3	II	484+20 to 492+26	SB	0.41	0.45	0.43
5	I	481+10 to 486+50	NB	0.30	0.32	0.31
6	I	476+50 to 481+10	NB	0.34	0.39	0.37
6	I	474+30 to 484+20	SB	0.40	0.42	0.41
7	III	466+50 to 476+50	NB	0.40	0.42	0.41
7	III	466+50 to 474+30	SB	0.37	0.40	0.39
9	IV	456+50 to 466+50	NB	0.45	0.47	0.46
9	IV	456+40 to 466+50	SB	0.46	0.52	0.49
10	V	446+50 to 456+50	NB	0.45	0.51	0.47
10	V	446+50 to 456+40	SB	0.48	0.51	0.49

Bituminous Aggregate				
Location	Direction	Coefficient of Wsf		
		Low	High	Avg
North of Hawkins Rd	NB	0.26	0.34	0.30
South of Hill Rd	NB	0.29	0.31	0.30
North of Round Lake Rd	NB	0.21	0.26	0.24
North of Rollin Rd	SB	0.33	0.42	0.36
South of Rollin Rd	SB	0.20	0.25	0.22
North of Slee Rd	SB	0.26	0.40	0.35

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 22, 1973

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

From: L. T. Oehler

Subject: Fall Skid Tests on Napoleon Sandstone Project (Mb 46061-04845A)
Research Project 54 G-74, 73 SR-19A

In accord with P. J. Serafin's request dated July 24, 1973, follow-up skid tests have been conducted on subject project. A second series of tests were made October 17 and 19, 1973 and data are shown on the attached resume. On the 5000-ft experimental Napoleon Sandstone Blend portion of this project, October skid tests yielded friction levels ranging from 0.22 to 0.41 and averaging 0.31, 26 percent lower than determined in August of this year. The remaining 9.68 miles of subject project was constructed with a conventional bituminous aggregate 4.11 wearing course. October skid tests on this surface revealed friction levels ranging from 0.17 to 0.31 and averaging 0.23, 23 percent lower than tests conducted during August.

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:cgc
Attachment

cc: D. E. Orne
P. J. Serafin
A. P. Chritz

SKID TEST DATA RESUME

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

Bituminous Aggregate		August 23, 1973			October 19, 1973		
Location	Direction	Coefficient of Wsf Low	High	Avg.	Low	High	Avg.
North of Hawkins Road	NB	0.26	0.34	0.30	0.26	0.28	0.27
South of Hill Road	NB	0.29	0.31	0.30	0.22	0.27	0.24
North of Round Lake Road	NB	0.21	0.26	0.24	0.17	0.19	0.18
North of Rollin Road	SB	0.33	0.42	0.36	0.21	0.22	0.21
South of Rollin Road	SB	0.20	0.25	0.22	0.20	0.21	0.20
North of Slee Road	SB	0.26	0.40	0.35	0.28	0.31	0.30

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 5, 1973

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

From: L. T. Oehler

Subject: Skid Tests on US 2 Between Ironwood and Bessemer, Control Section 27021. Research Project 54 G-74, 73 SR-20.

In accord with a July 26, 1973 request from L. J. Doyle, skid tests have been conducted at five curve locations on US 2 in Gogebic County. Friction levels determined from 60 skid tests on August 29, 1973 ranged from 0.49 to 0.72 and averaged 0.60. All five curve areas tested had excellent coefficients of wet sliding friction as may be seen below.

Milepost Description of Curve Area	Direction and Lane	40 mph Coefficient of Wsf Low	High	Avg
Curve No. 1 (2.95 - 3.45)	EBOL	0.52	0.53	0.53
	EBIL	0.61	0.63	0.62
	WBOL	0.59	0.62	0.60
	WBIL	0.69	0.72	0.70
Curve No. 2 (4.00 - 4.08)	EBOL	0.49	0.53	0.52
	EBIL	0.60	0.65	0.63
	WBOL	0.54	0.64	0.60
	WBIL	0.68	0.70	0.69
Curve No. 3 (4.44 - 4.59)	EBOL	0.53	0.57	0.55
	EBIL	0.65	0.68	0.66
	WBOL	0.55	0.58	0.57
	WBIL	0.56	0.69	0.63
Curve No. 4 (5.02 - 5.30)	EBOL	0.49	0.56	0.52
	EBIL	0.59	0.67	0.64
	WBOL	0.54	0.56	0.55
	WBIL	0.64	0.67	0.66
Curve No. 5 (5.36 - 5.64)	EBOL	0.50	0.53	0.52
	EBIL	0.53	0.62	0.58
	WBOL	0.56	0.58	0.57
	WBIL	0.59	0.63	0.62

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: M. N. Clyde
L. J. Doyle
E. L. Martin

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 5, 1973

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

From: L. T. Oehler

Subject: Skid Tests on Project Mtb 18022-05548A
Research Projects 73 C-15 and 54 G-74, 73 SR-21

In accord with a August 14, 1973 request from C. D. Church, skid tests have been conducted on US-10 between the west city limits of Clare and M-115. In this area, a vibratory roller was used in the construction of the 6.09 miles of bituminous aggregate surfacing. Friction levels determined August 24, 1973 ranged from 0.24 to 0.44 and averaged 0.36. Below, coefficients have been separated into four test areas for review.

Test Area	Surface Compaction Method*	Direction	Coefficients of Wet Sliding Friction (40 mph)		
			Low	High	Avg.
West of Clare	(2)	EB	0.40	0.44	0.42
	(1)	WB	0.38	0.43	0.40
East of Bradley Road	(2)	EB	0.36	0.40	0.39
	(1)	WB	0.39	0.41	0.40
Station 208+50 to 211+50 (Growth Curve Area)	(3)	EB	0.24	0.28	0.27
	(3)	WB	0.28	0.32	0.30
West of Farwell	(2)	EB	0.32	0.35	0.34
	(2)	WB	0.36	0.38	0.37

* (1) Static roller only
(2) 1 pass static, 1 pass vibratory, 2 passes static
(3) Growth Curve area for vibratory roller.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:cgc

cc: C. D. Church

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

November 13, 1973

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

From: L. T. Oehler

Subject: Skid Tests Results on Vibratory Roller Sections
Research Projects 73 C-15 and 54 G-74, 73 SR-21A

Additional skid tests have been conducted on the vibratory roller sections located on US-10 between Clare and M-115 (Project Mtb 18022-05548A). Wsf values determined October 26, 1973 ranged from 0.20 to 0.33 and averaged 0.26. These indicate an average friction level decline ranging from 20 to 30 percent since the August 24, 1973 tests.

Initial skid tests were conducted on M-18, between Gladwin and Beaverton. This area is a portion of Project Mb 26011-04773A and was also a site for experimentation with the vibratory roller. Coefficients determined September 21, 1973 ranged from 0.40 to 0.56 and averaged 0.50.

Attached is a breakdown of test data for your review.

TESTING AND RESEARCH DIVISION

L Ray T. Oehler
Engineer of Research

LTO:PMS:cgc
Attachment

cc: C. D. Church
C. A. Zapata

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
West of Clare	(2)	EB	0.40	0.44	0.42	0.29	0.32	0.30
	(1)	WB	0.38	0.43	0.40	0.30	0.32	0.31
E. of Bradley Rd.	(2)	EB	0.36	0.40	0.39	0.26	0.30	0.28
	(1)	WB	0.39	0.41	0.40	0.31	0.33	0.32
Station 208+50 to 211+50 (Growth Curve Area)	(3)	EB	0.24	0.28	0.27	0.20	0.22	0.21
	(3)	WB	0.28	0.32	0.30	0.21	0.22	0.22
E. from old Pav't in Farwell	(2)	EB	Not tested			0.20	0.24	0.22
	(2)	WB	Not tested			0.21	0.22	0.22
W. of Farwell	(2)	EB	0.32	0.35	0.34	0.26	0.30	0.27
	(2)	WB	0.36	0.38	0.37	0.26	0.27	0.26

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

Skid Test Data
Project Mb 26011-04773A
(Part)

Test Area	Surface Compaction Method*	Direction	Coefficient of 40 mph WSF 9-21-73 Low	High	Avg.
M-18, Immediately South of Woods Road	C	NB	0.54	0.56	0.55
	C	SB	0.51	0.53	0.52
M-18, 0.5 mile South of Woods Road (Sta. 239 to 249)	V	NB	0.50	0.53	0.52
	C	SB	0.50	0.52	0.51
M-18, North of Burgess Road (Sta. 203 to 213)	C	NB	0.53	0.54	0.54
	V	SB	0.51	0.51	0.51
M-18, North from North Limits of Gladwin	C	NB	0.42	0.43	0.42
	C	SB	0.40	0.45	0.43

(*) C = Conventional Roller
V = Vibratory Roller

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 17, 1973

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

From: L. T. Oehler

Subject: Skid Tests on M-59 at the Curve Between Dequindre Road and Ryan Road, Macomb County. Research Project 54 G-74, 73 SR-22.

Skid tests have been conducted at subject location, in accord with a September 4, 1973 request from M. N. Clyde. Wsf values determined September 10, 1973 ranged from 0.20 to 0.42 and averaged 0.28 in the curve area. As may be seen below, a noticeable difference in friction level exists between inside lanes (averaging 0.34) and outside lanes (averaging 0.22). East of the curve, coefficients ranged from 0.32 to 0.54 and averaged 0.39. Below data from both areas tested are broken down for your review.

Lane Tested	40 mph Coefficient of WSF Low	High	Average
In Curve Area			
EBOL	0.21	0.25	0.23
EBIL	0.28	0.35	0.32
WBOL	0.20	0.22	0.21
WBIL	0.30	0.42	0.35
East of Curve Area			
EBOL	0.36	0.37	0.37
EBIL	0.33	0.34	0.33
WBOL	0.32	0.33	0.33
WBIL	0.48	0.54	0.52

TESTING AND RESEARCH DIVISION

Engineer of Research

LTO:PMS:cgc

cc: M. N. Clyde
P. J. Riley

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 19, 1973

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

From: L. T. Oehler

Subject: Skid Test Data for "Railroad-Highway Grade Crossing Safety" study. Research Project 54 G-74 and 73 TI-174, 73 SR-23.

In accord with a letter from N. C. Jones dated September 14, 1973, 40 mph wet and dry skid tests have been conducted at two railroad grade crossings in Livingston County, using the ASTM E 249 test tire. Skid tests were conducted at both crossings October 16, 1973 in a 600-ft area preceding the crossings (with respect to traffic direction). The surface is a recently constructed bituminous aggregate mat, gray in color and free of any major deteriorations. Although requested, coefficients were not determined on adjacent shoulder areas because the surface consisted of gravel. Friction levels from the October 16 tests are listed below.

G01 of 47041 - Crossing of the GTW RR with M 36 in the Village of Gregory.

Direction	Type of Test	Coefficient of Sliding Friction		
		Low	High	Avg
NB	Dry	0.66	0.70	0.67
SB	Dry	0.67	0.71	0.69
NB	Wet	0.41	0.44	0.42
SB	Wet	0.42	0.45	0.44

G02 of 47041 - Crossing of the GTW RR with M 36, 4.6 miles west of Pinckney.

Direction	Type of Test	Coefficient of Sliding Friction		
		Low	High	Avg
EB	Dry	0.68	0.71	0.70
WB	Dry	0.62	0.66	0.64
EB	Wet	0.41	0.45	0.44
WB	Wet	0.41	0.45	0.43

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: N. C. Jones

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 5, 1973

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

From: L. T. Oehler

Subject: Skid Tests on Project 72061-00995A
Research Project 54 G-74, 73 SR-24

In accord with a September 30, 1973 verbal request from L. J. Doyle and Max N. Clyde, skid tests have been conducted on I-75, west from the Ogemaw-Roscommon County Line. Attention was called to this roadway surface as being potentially slippery by personnel from District 4. Wsf values ranging from 0.52 to 0.69 and averaging 0.60 were determined on September 25, 1973. A total of 60 skid tests were conducted throughout the 8.02 mile length of the project. These coefficients do not indicate a slippery condition.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research
Research Laboratory Section

LTO:nag

cc: Max N. Clyde
F. Eggan
T. Gilroy

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

November 19, 1973

Mr. Fredrick A. Mammel, P. E.
Superintendent of Public Works
City of Ann Arbor
100 North Fifth Avenue
Ann Arbor, Michigan 48108

Dear Mr. Mammel:

Pavement Skid Resistance Measurements
on State Road, City of Ann Arbor
Research Project 54 G-74, 73 SR-25

In response to your October, 1973 request, skid test personnel met with Mr. Haley of your staff on November 8, 1973 and conducted pavement skid resistance measurements at the subject location. Five 40 mph wet sliding friction measurements on this bituminous surface range from 0.36 to 0.38 and average 0.37. Although these values might be considered marginal, pavement friction levels of this magnitude are frequently encountered on heavily travelled thoroughfares and should be adequate for conditions (35 mph maximum speed, etc.) prevailing at this site. If there are many instances of near panic stops, a higher friction level may be needed.

Exact charges for these testing services will be determined by our Financial Administration Division and your Purchase Order (No. 1-1707) has been submitted to them for processing. This cost will be near the minimal value of $50.00 quoted earlier since test personnel were routinely operating in the Ann Arbor vicinity.

Very truly yours,

TESTING AND RESEARCH DIVISION

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

MICHIGAN
THE GREAT LAKE STATE

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

November 27, 1973

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

From: L. T. Oehler

Subject: Skid Test Results on G01 of 59052 and G02 of 61073.
Research Project 54 G-74, 73 SR-26.

In accord with a memo from N. C. Jones dated October 15, 1973, 40 mph wet and dry skid tests have been conducted at two railroad crossings using the ASTM E 249 Test Tire. Tests were confined to the bituminous areas approaching the crossings. A gravel shoulder exists at both locations, consequently shoulder tests were not conducted. Listed below is a summary of our survey at the crossings.

G01 of 59052 - Crossing of the Chesapeake and Ohio Railroad with Highway M-66 in the Village of Six Lakes, Montcalm County.

A moderate amount of cracking prevails at this location, with a slightly higher crack frequency in the northbound lane.

Direction	Type of Test	Coefficient of Sliding Friction Low	High	Average
NB	Dry	0.71	0.73	0.72
SB	Dry	0.71	0.73	0.72
NB	Wet	0.41	0.45	0.43
SB	Wet	0.35	0.39	0.38

G02 of 61073 - Crossing of the Chesapeake and Ohio Railroad with Fruitvale Road, Montague Township, Muskegon County.

The eastbound lane has bituminous patches, slightly darker in color, extending in from the outside pavement edge. A 300-ft patch, lighter in color, extends in approximately 4-ft from the westbound pavement edge. Transition from patched to non-patched roadway surface is smooth.

EB	Dry	0.71	0.75	0.73
WB	Dry	0.71	0.72	0.71
EB	Wet	0.49	0.55	0.52
WB	Wet	0.48	0.53	0.50

TESTING AND RESEARCH DIVISION

LTO:PMS:cgc
cc: N. C. Jones

L. T. Oehler
Engineer of Research

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

November 12, 1973

To: Bob Felter
Pavement Performance Group

From: Paul Schafer

Subject: Skid Tests on WB I 94 in Washtenaw and Jackson Counties.
Research Project 54 G-74, 73 SR-27.

In accord with a October 25, 1973 request from M. Rothstein, skid tests have been conducted on westbound I 94 between Race Road and Fletcher Road. Wsf values were determined November 8, 1973. The Washtenaw County portion of this request, WB I 94 from Fletcher Rd west to the Washtenaw-Jackson County Line, yielded friction levels ranging from 0.42 to 0.61 and averaging 0.52. In Jackson County wsf values ranging from 0.31 to 0.50 and averaging 0.41 were determined. Below is a breakdown of skid test data for your review.

Control Section	WB I 94 Test Location	Lane	November 8, 1973 Coefficient of Wsf		
			Low	High	Avg
81104	West from Fletcher Rd	WBOL	0.42	0.46	0.45
		WBIL	0.57	0.61	0.58
38103	West from County Line	WBOL	0.31	0.38	0.34
		WBIL	0.47	0.50	0.48

When you report PSI determinations for subject area include the above skid test information.

TESTING AND RESEARCH DIVISION

Paul Schafer

P. M. Schafer
Pavement Performance Group

PMS:bf

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

November 2, 1973

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

From: L. T. Oehler

Subject: Skid Test Results on Bituminous Surface Using White Pine Slag
Research Projects 54 G-74 and 72 NM-316. 73 SR-28

As per your verbal instructions, skid tests have been conducted on Halfway Road, running south and east from a point approximately 7 miles west of Ontonagon. A bituminous surface containing White Pine Slag was placed on this road in late September. Skid tests were conducted October 2, 1973 and relatively uniform coefficients were determined throughout the entire 2 mile length of this surface. Friction levels from 18 skid tests ranged from 0.47 to 0.58 and averaged 0.53.

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:cgc

cc: D. F. Malott
D. E. Orne
P. J. Serafin

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

December 6, 1973

To: Max N. Clyde
Engineer of Traffic and Safety

From: K. A. Allemeier

Subject: M 59 Skid Test Results
Research Project 54 G-74, 73 SR-29.

In accord with a letter from L. J. Doyle, Assistant Engineer of Traffic and Safety, dated November 13, 1973, skid tests have been conducted on M 59 between Auburn Rd and Mound Rd in Oakland and Macomb Counties.

Project 63043-013 - M 59 from Auburn Rd E'ly to the Oakland-Macomb County Line.

Initial skid tests were conducted September 18, 1972. Average wsf values indicated good skid resistance with values of 0.55 or higher in all lanes. On November 21, 1973, a series of 80 tests were taken. Wsf values ranged from 0.26 to 0.50 and averaged 0.33. At this time, only the inside lanes between Auburn and Rochester Rd had average friction levels of 0.40 or higher.

Project 50023 (00665A) - M 59 from the Oakland-Macomb County Line E'ly to Mound Rd.

Initial skid tests were conducted September 18, 1972. Good skid resistance was indicated, as wsf values of 0.56 or greater were determined on all four lanes. Additional skid tests were made in the curve area east of Dequindre Rd and the area west of Ryan Rd on September 10, 1973. Average wsf values of 0.25 and 0.28 were determined in the outside lanes, while the inside lanes yielded average friction levels of 0.33 and 0.41. Data from this test series were reported to you September 21, 1973 as Special Request No. 22. In the most recent test series, November 21, 1973, 45 tests were conducted. Wsf values ranging from 0.23 to 0.52 and averaging 0.37 were encountered. EBOL and WBOL in the Dequindre Rd to Ryan Rd area had average friction levels of 0.27 and 0.26, respectively.

A history of the aformentioned skid test results is attached for your review.

TESTING AND RESEARCH DIVISION

K. A. Allemeier

Acting Engineer of Testing and Research

LTO:PMS:bf

cc: P. J. Riley
L. J. Doyle
L. T. Oehler

1972 Construction
63043-034 (00861A)

Test Date	Test Location	Lane	Coefficient of Wsf		
			Low	High	Avg.
9-18-72	Auburn Rd E'ly to Oakland Macomb County Line	EBOL	0.45	0.60	0.55
		EBIL	0.37[1]	0.61	0.55
		WBOL	0.52	0.61	0.57
		WBIL	0.54	0.62	0.58
11-21-73	Auburn Rd to Rochester Rd	EBOL	0.33	0.43	0.37
		EBIL	0.39	0.40	0.40
		WBOL	0.26	0.32	0.28
		WBIL	0.39	0.50	0.45
11-21-73	Rochester Rd to John R	EBOL	0.29	0.39	0.33
		EBIL	0.27	0.34	0.30
		WBOL	0.27	0.35	0.30
		WBIL	0.34	0.42	0.39
11-21-73	John R to Oakland-Macomb County Line (Dequindre Rd)	EBOL	0.28	0.34	0.31
		EBIL	0.32	0.42	0.37
		WBOL	0.26	0.38	0.30
		WBIL	0.31	0.48	0.38

[1] Haul trucks were entering highway at this point

1972 Construction
50023-00665A

Test Date	Test Location	Lane	Coefficient of Wsf		
			Low	High	Avg.
9-18-72	Oakland-Macomb County Line (Dequindre Rd) E'ly to Mound Rd	EBOL	0.47	0.66	0.57
		EBIL	0.48	0.66	0.56
		WBOL	0.55	0.66	0.62
		WBIL	0.44	0.67	0.60
9-10-73	Curve area between Dequindre and Ryan Rds thence E'ly to Ryan Rd	EBOL	0.21	0.37	0.28
		EBIL	0.28	0.35	0.33
		WBOL	0.20	0.33	0.25
		WBIL	0.30	0.54	0.41
11-21-73	Oakland-Macomb County Line (Dequindre Rd) to Ryan Rd	EBOL	0.24	0.31	0.27
		EBIL	0.34	0.41	0.37
		WBOL	0.23	0.28	0.26
		WBIL	0.31	0.47	0.41
11-21-73	Ryan Rd to Mound Rd	EBOL	0.36	0.44	0.39
		EBIL	0.43	0.52	0.48
		WBOL	0.34	0.39	0.37
		WBIL	0.39	0.47	0.43

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

November 28, 1973

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

From: L. T. Oehler

Subject: Skid Test Results for Project No. FI 25031, Job No. 04212A, etc.
Research Project 54 G-74, 73 SR-30

In response to your November 7, 1973 request, skid tests were performed on the subject I-75 bituminous resurfacing project at the locations supplied by M. J. Tiedt. Data from these November 27, 1973 tests tabulated, by test lane and compaction method, are summarized below for your review.

	Vibratory Roller				Static Roller			
	No. of	Coefficient of wsf			No. of	Coefficient of wsf		
Test Lane	Tests	Low	High	Avg.	Tests	Low	High	Avg.
SBOL	9	0.59	0.69	0.64	0	---	---	---
SBCL	9	0.64	0.72	0.67	0	---	---	---
SBIL	3	0.61	0.65	0.63	6	0.70	0.73	0.71
Combined SB Lanes (Slag agg.)	21	0.59	0.72	0.65	6	0.70	0.73	0.71
NBOL	0	---	---	---	9	0.60	0.72	0.65
NBCL	9	0.66	0.72	0.69	0	---	---	---
NBIL	6	0.74	0.76	0.75	3	0.70	0.73	0.71
Combined NB Lanes (Nat. agg.)	15	0.66	0.76	0.71	12	0.60	0.73	0.66
All Lanes	36	0.59	0.76	0.68	18	0.60	0.73	0.68

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PTL:cgc

cc: M. J. Tiedt

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

November 26, 1973

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

From: L. T. Oehler

Subject: Skid Test Results on Entrance Loop to Eastbound I-75 from M-150 (Rochester Road) and on I-75 in the "S" Curve near Goddard Road. Research Project 54 G-74, 73 SR-31.

In accord with a request from L. J. Doyle dated November 14, 1973, skid tests were conducted November 15, 1973 at the two subject locations.

Results of tests on the entrance loop from M-150 (Rochester Road), to eastbound I-75 indicated friction levels ranging from 0.32 to 0.38 and averaging 0.35. Two tests conducted on the southbound I-75 structure over M-150 yielded wsf values of 0.33 and 0.36.

Tests made on I-75 in the "S" Curve near Goddard Road had skid test wsf values ranging from 0.28 to 0.46 and averaging 0.36. Skid tests were conducted in this area, at 500-ft intervals, and are listed below for your review.

	40 mph Coefficient of Wet Sliding Friction					
Station	SBOL	SBCL	SBIL	NBIL	NBCL	NBOL
685	0.30	0.38	0.39	0.44	0.37	0.33
690	0.33	0.37	0.37	0.45	0.40	0.33
695	0.32	0.38	0.36	0.46	0.36	0.34
700	0.34	0.38	0.38	0.42	0.36	0.31
705	0.34	0.39	0.36	0.40	0.36	0.32
710	0.32	0.39	0.39	0.45	0.39	0.33
715	0.30	0.37	0.39	0.42	0.36	0.30
720	0.31	0.38	0.41	0.41	0.38	0.32
725	0.31	0.41	0.38	0.35	0.42	0.31
730	0.34	0.42	0.39	0.34	0.35	0.28
735	0.30	0.34	0.40	0.34	0.38	0.29
Low	0.30	0.34	0.36	0.34	0.35	0.28
High	0.34	0.42	0.41	0.46	0.42	0.34
Average	0.32	0.38	0.38	0.41	0.38	0.31

TESTING AND RESEARCH DIVISION

LTO:PMS:cgc
cc: M. N. Clyde
L. J. Doyle
P. J. Riley

L. T. Oehler
Engineer of Research

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

December 18, 1973

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

From: L. T. Oehler

Subject: Skid Test Results in Control Sections 78051 and 23012.
Research Project 54 G-74, 73 SR-32.

In accord with a December 5, 1973 request from M. N. Clyde, skid tests have been completed at locations specified in the cities of Sturgis and Charlotte.

Eighty-two skid tests were conducted on M 66 between mileposts 1.49 and 2.65 in Control Section 78051. The outside lanes are portland cement concrete and the inside lanes are bituminous in this area. Friction levels ranged from 0.36 to 0.43 and averaged 0.39 in the outside lanes. Inside lane coefficients ranged from 0.48 to 0.58 and averaged 0.53.

Skid tests were also conducted on US 27BR-M 78 in the curve area at Pleasant St in the city of Charlotte. Coefficients ranging from 0.47 to 0.52 and averaging 0.49 were determined.

Individual coefficients for the aformentioned test areas are shown in the attached table for your review.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research
Research Laboratory Section

LTO:PMS:bf

cc: M. N. Clyde
J. P. Neve Jr.
E. H. Miller
R. E. Maki

M 66 from Fawn River Rd to US 12 (West Chicago Rd)
December 4, 1973 Skid Test Results
Control Section 78051

Location of Tests	NBOL	NBIL	SBOL	SBIL
Milepost 1.49 to 1.98	0.43	0.52	0.43	0.55
(tests conducted @ 500-ft intervals)	0.39	0.58	0.40	0.56
	0.42	0.58	0.42	0.54
	0.40	0.57	0.40	0.54
	0.40	0.52	0.38	0.48
	0.43	0.53	0.40	0.50
Stopping Area @ Elm St	0.36	0.56	--	--
	0.41	0.54	--	--
Stopping Area @ Magnolia St	0.38	0.51	--	--
	0.38	0.48	--	--
Stopping Area @ Forest St	0.39	0.51	--	--
	0.41	0.49	--	--
Between Forest and Norwood Sts	0.40	--	--	--
Stopping Area @ Norwood St	0.38	0.54	--	--
	0.40	0.55	--	--
Stopping Area @ Wenzell St	0.41	0.51	--	--
	0.42	0.51	--	--
Stopping Area @ Enterprise St	0.38	0.53	--	--
	0.37	0.54	--	--
Stopping Area @ Congress St	0.39	0.49	--	--
	0.38	0.51	--	--
South of US 12 (new pad not tested)	0.37	0.52	--	--
	0.38	0.52	--	--
Between US 12 and Ohio St	--	--	0.43	0.53
	--	--	0.43	0.56
	--	--	--	0.53
	--	--	--	0.55
Stopping Area @ Ohio St	--	--	0.38	0.57
	--	--	0.38	0.53
	--	--	0.36	--
Between Ohio and Magnolia Sts	--	--	0.38	0.54
	--	--	0.37	0.52
	--	--	0.41	0.55
	--	--	0.39	0.57
Between Magnolia and South Sts	--	--	0.38	0.53
Stopping Area @ South St	--	--	0.41	0.51
	--	--	0.37	0.52

US 27 BR - M 78 (Lawrence Ave - Lansing Rd) @ Pleasant St in Charlotte
December 4, 1973 Skid Test Results
Control Section 23012

Location of Tests	NBOL	NBIL	SBOL	SBIL
Curve Area @ Pleasant St	0.49	0.49	0.48	0.51
	0.47	0.47	0.51	0.50
	0.51	0.47	0.49	0.52

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

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

June 27, 1973

To: Max N. Clyde
Engineer of Testing and Research

From: L. T. Oehler

Subject: Skid Tests on M-28 in Ontonagon County.
Research Project 54 G-74, 73 SA-1

Routine skid tests were conducted June 20, 1973 on M-28 from 926 ft east of US 45, in Bruce Crossing, east and south to approximately one mile west of Trout Creek (Project F 66023-00955A). Coefficients ranging from 0.29 to 0.56 and averaging 0.42 were determined. A shoulder sealing operation appears to be the reason for low friction values encountered. The seal was being tracked onto the main roadway by construction traffic. At the time skid tests were conducted, the sealing operation was between Bruce Crossing and Trout Creek on the westbound side. Westbound friction levels in this area ranged from 0.29 to 0.33 and averaged 0.32. West of Trout Creek, where the shoulders had been sealed, coefficients ranged from 0.39 to 0.56 and averaged 0.48. Additional skid tests will be conducted on this project later this year.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research
Research Laboratory Section

LTO:FC:bf

cc: L. J. Doyle
A. J. Marusich

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 25, 1973

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

From: L. T. Oehler

Subject: Additional Skid Tests on M-28 in Ontonagon County.
Research Project 54 G-74, 73 SA-1A

Routine skid tests were conducted in June on M-28 from 926 ft east of US-45, in Bruce Crossing, east and south to approximately one mile west of Trout Creek (Project F 66023-00955A). Resulting coefficients, which ranged from 0.29 to 0.56 and averaged 0.42, were reported in my memo dated June 27, 1973. Follow-up skid tests on this project were completed August 29, 1973. No friction levels below 0.40 were determined at this time. The August coefficients ranged from 0.45 to 0.68 and averaged 0.59.

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:cgc

cc: L. J. Doyle
A. J. Marusich
D. E. Orne
P. J. Serafin

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 5, 1973

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.
Research Project 54 G-74, 73 SA-2.

Routine skid tests were conducted September 4, 1973 on a bituminous aggregate project which was constructed during 1973. This 7.091 mile project (Mb 33021-04774A) is located on M 36 commencing in Mason at a point 150 feet NW of Curtis St and continuing intermittently in a SE'ly direction to 0.5 mile W of M 52. Coefficients ranging from 0.18 to 0.53 and averaging 0.36 were encountered. Fifty-seven percent of the 42 skid tests yielded wsf values below 0.40; 29 percent were lower than 0.30 and 14 percent were 0.20 or lower. Results of these September 4 skid tests are broken down into the various test location areas and are presented on the attachment.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

attachment

LTO:PMS:bf

cc: M. N. Clyde
R. C. Mastin

September 4, 1973 skid tests results of Project Mb 33021-04774A

Test Location	Direction	40 mph Coefficient of Wsf		
		Low	High	Avg
East of Mason	EB	0.29	0.38	0.33
	WB	0.18	0.20	0.19
At Ives Rd	EB	0.23	0.41	0.34
	WB	0.34	0.37	0.36
Curve Area W of Every Rd	EB	0.27	0.32	0.29
	WB	0.36	0.47	0.41
East of Diamond Rd	EB	0.49	0.53	0.51
	WB	0.39	0.41	0.40
East of Meridian Rd	EB	0.26	0.34	0.29
	WB	0.19	0.20	0.20
At Jessop Rd	EB	0.38	0.42	0.40
(East of Dansville)	WB	0.42	0.45	0.44
West of Meech Rd	EB	0.43	0.48	0.46
	WB	0.35	0.44	0.40

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

December 7, 1973

To: K. A. Allemeier
Acting Engineer of Testing & 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, 73 SA-2A

Initial testing was accomplished on subject project September 4, 1973 and data sent to you September 5th. At this time, friction levels ranged from 0.18 to 0.53 and averaged 0.36. Twenty-nine percent of coefficients encountered were below 0.30 and 43 percent were 0.40 or higher.

On November 30, 1973, at the request of P. J. Serafin, the project was tested again. Fifty skid tests were then conducted and friction levels ranged from 0.24 to 0.50 and averaged 0.37. Ten percent of the wsf values were lower than 0.30 and 32 percent were 0.40 or higher. No significant increase or decrease in skid resistance has occurred since the initial tests were conducted three months ago. Variability in the pavement surface can be visually detected with some areas showing a sheen. Subject roadway has been posted with "Slippery When Wet" signs.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:cgc

cc: P. J. Serafin

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

September 14, 1973

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

From: L. T. Oehler

Subject: Recent Skid Tests on M-27 in Cheboygan
Research Project 54 G-74, 73 SA-3

During a routine followup at the 10 year service level, Project 16032, C4 was skid tested. Wsf values ranging from 0.27 to 0.30 and averaging 0.28 were encountered September 5, 1973 on M-27 between Seymour Street and the US-23 junction in Cheboygan.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:cgc

cc: M. N. Clyde
District Engineer

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

October 19, 1973

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

From: L. T. Oehler

Subject: Skid Test Results. Research Project 54 G-74, 73 SA-4.

Effective immediately, all locations with friction levels of 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.

Attached is a list of locations, the majority of which have yielded coefficients of wet sliding friction below 0.30.

TESTING AND RESEARCH DIVISION

L. T. Oehler

Engineer of Research

LTO:PMS:bf

cc: M. N. Clyde
J. F. Oravec
W. A. Sawyer

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
08012C, C10	M-43 (Broadway) from Thorn St. to State Rd. in Hastings	Bit	NBOL	0.33	0.41	0.36
			NBIL	0.29	0.31	0.30
			SBIL	0.30	0.34	0.32
09032, C8 09033, C6	M-13 from 350 ft N of Wilder N'ly to M-247	Bit	NBOL	0.33	0.38	0.36
			NBIL	0.34	0.36	0.35
			SBOL	0.29	0.34	0.31
			SBIL	0.32	0.34	0.33
11052-002	US-33 (Niles Ave.) from Midway Ave. N'ly to Winchester Ave., City of St. Joseph	Conc	NBOL	0.27	0.28	0.27
			NBIL	0.25	0.30	0.28
			SBOL	0.27	0.32	0.30
			SBIL	0.30	0.33	0.31
B02 of 11052	US-31 - US-33 over St. Joseph River in Berrien Springs	Rubberized Bit Conc	NB	0.19	0.35	0.26
			SB	0.22	0.35	0.26
16032C, C4	M-27 from Seymour St, NE to US-23	Bit	NB	0.28	0.29	0.28
			SB	0.27	0.30	0.28
S06 of 25031	Grand Blanc Rd over US-23	Latex Conc	EB	0.26	0.28	0.27
			WB	0.32	0.35	0.33
25072	M-54 Stopping Area at Coldwater Rd., N. of Flint	Bit	SBOL	0.30	0.31	0.30
Mb 25091-006	M-15 from S. Limits of Davison to N. Limits	Conc	NBOL	0.29	0.32	0.31
			SBOL	0.27	0.30	0.28
S39 of 25132	Jennings Rd. over I-475, N. of Flint	Latex Mod. Mortar	NB	0.31	0.32	0.31
			SB	0.28	0.32	0.30
33081-04974A	WB M-43 (E. Grand River) from 100 ft W. of Homer St., W. to 170 ft W. of Marshall St.	E. of Foster St.				
		Bit.	WBOL	0.33	0.39	0.35
			WB#3	0.21	0.29	0.25
			WB#2	0.35	0.36	0.36
		W. of Foster St.				
		Bit	WBOL	0.33	0.36	0.35
38082-002 (Part)	I-94 BL from 1160 ft W. of M-60 E'ly to 35 ft W. of Brown St. (W. City Limits of Jackson)	Bit	EB	0.35	0.36	0.36

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
38082-002 (Part)	I-94 BL from 30 ft E. of E. St. in City of Jackson, E'ly to W. of US-127 (Control Section 38083)	West of Mile Post 3.148 (Ganson)				
		Bit	EBOL	0.23	0.26	0.24
			EBIL	0.28	0.28	0.28
			WBOL	0.25	0.28	0.27
			WBIL	0.26	0.30	0.29
		East of Mile Post 3.148 (Ganson)				
		Bit	EBOL	0.32	0.35	0.33
			EBIL	0.34	0.38	0.37
			WBOL	0.33	0.36	0.35
44031, C1	M-53 from S. Limits of Imlay City N to M-21	Bit	SB	0.23	0.30	0.27
50052-03804A	US-25 - M-59 (Gratiot Ave) from 150 ft N of 21 Mile Rd NE to 590 ft S. of 23 Mile Road	Bit	SBOL	0.29	0.34	0.32
55031, C9	M-35 from US-41 NE'ly to N Limits of Menominee	Conc	NBOL	0.25	0.28	0.26
61024C, C1	M-37 from M-46 E to Cassnovia	Bit	EB	0.27	0.30	0.28
			WB	0.31	0.35	0.33
73063B, C6	M-46 from intersection of Rust and Sheridan Sts. N on Sheridan St. to Remmington St. (WB); Also, N on Warren St. to Holland St. to Genesee St. (EB) in Saginaw	Conc	EBOL	0.31	0.33	0.32
			EBCL	0.32	0.32	0.32
			EBIL	0.33	0.33	0.33
			WBOL	0.30	0.30	0.30
			WBCL	0.29	0.33	0.31
			WBIL	0.31	0.33	0.32
B02 of 73062	M-46 over Tittabawassee River	Modified Mortar Overlay	EBOL	0.26	0.28	0.27
			EBIL	0.28	0.33	0.30
			WBOL	0.26	0.28	0.27
			WBIL	0.30	0.34	0.32
81062-05273A	EB I-94 from 1283 ft E. of Carpenter Rd. E'ly to 1314 ft E. of NB US-12	Bit	EBOL	0.29	0.32	0.31
S18 of 82025	Allard Avenue over I-94	Polyurethane	WBIL	0.20	0.31	0.24
		Polyurethane	EBIL	0.15	0.20	0.18
		Conc	WBIL	0.33	0.41	0.37

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
82081-017 (01195A)	M-153 (Ford Rd) from E. of Greenfield Rd E to E. of Appoline St.	Conc	WB#3	0.29	0.30	0.30
			WB#2	0.31	0.36	0.34
			WBIL	0.35	0.39	0.37
		Bit	EBOL	0.30	0.34	0.31
			EBCL	0.30	0.31	0.30
			WBCL	0.31	0.35	0.33
S16 of 82111	I-96 BS (Grand River) over I-696	Rubberized Bit Conc	EBCL	0.27	0.32	0.29
			EBIL	0.32	0.34	0.33
			WBOL	0.32	0.34	0.33
			WBCL	0.27	0.30	0.28
			WBIL	0.34	0.37	0.35
82121-011	I-96 BS (Grand River) from I-94 SE to Trumbull	Bit	EBOL	0.27	0.30	0.29
			EBIL	0.34	0.36	0.35
			WBOL	0.23	0.27	0.25
			WBIL	0.34	0.36	0.35
82131-010	M-1 (Woodward Ave) from Adams St. NW'ly to W. of Grand Blvd., City of Detroit	Bit	NBOL	0.27	0.28	0.27
			NBCL	0.25	0.29	0.27
			NBIL	0.27	0.30	0.29
			SBOL	0.34	0.37	0.35
			SBCL	0.32	0.36	0.34
			SBIL	0.32	0.34	0.33
82141-03966A	M-102 (Eight Mile) from Garfield St. E'ly to M-39 (Southfield)	Bit	EBOL	0.26	0.27	0.27
			EBCL	0.24	0.28	0.26
			EBIL	0.29	0.33	0.31
			WBOL	0.17	0.19	0.18
			WBCL	0.26	0.26	0.26
			WBIL	0.30	0.32	0.31
82142-01310A	M-102 (Eight Mile) from W. Limits of Ferndale E'ly to M-1 (Woodward)	Bit	EBOL	0.28	0.30	0.29
			EB#3	0.31	0.32	0.32
			EB#2	0.31	0.33	0.32
			EBIL	0.33	0.33	0.33
			WBOL	0.32	0.35	0.34
			WB#3	0.27	0.28	0.27
			WB#2	0.27	0.30	0.28
			WBIL	0.29	0.34	0.32
B03 of 82191	I-75 over Goddard Road	Latex Conc	SBOL	0.28	0.33	0.31
			SBCL	0.34	0.36	0.35
			SBIL	0.33	0.34	0.34

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
Mm 9 SC-4A (60021)	M-32, 0.5 mile W. of Atlanta	Bit	EB	0.31	0.36	0.34
	M-32, W. of Thorton Road	Bit	EB	0.26	0.36	0.30
			WB	0.20	0.32	0.27
	M-32, through Manier Rd. Curve	Bit	EB	0.28	0.35	0.32
			WB	0.23	0.38	0.34
	M-32, W. of Manier Rd. Curve	Bit	EB	0.14	0.30	0.21
			WB	0.17	0.30	0.24

OFFICE MEMORANDUM

MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

January 15, 1974

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

From: L. T. Oehler

Subject: Report of Pavements with 40 mph WSF Values of 0.35 or lower
Research Project 54 G-74, 73 SA-5

In conformance with our recent discussions, attached is a list of pavement projects with 40 mph wsf values of 0.35 or lower, which were found in our routine test program for 1973.

Skid values by themselves do not indicate the adequacy of pavement friction, but are to be used together with other prevailing conditions for a complete evaluation.

TESTING AND RESEARCH DIVISION

L. T. Oehler
Engineer of Research

LTO:PMS:cgc
Attachment

cc: M. N. Clyde

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
08012C, C10	M-43 (Broadway) from Thorn Street to State Road, Hastings	Bit	NBOL	0.33	0.41	0.36
			NBIL	0.29	0.31	0.30
			SBOL	0.37	0.41	0.39
			SBIL	0.30	0.34	0.32
11052D, C5	US-31 - US-33 from Ferry Street	4-Lane Roadway in Berrien Springs				
11052D, C6	in Berrien Springs NE'ly 1.438 miles to College Avenue	Bit	NBOL	0.42	0.44	0.43
			NBIL	0.39	0.43	0.42
			SBOL	0.43	0.46	0.45
			SBIL	0.41	0.43	0.42
		2-Lane Roadway				
		Bit	NB	0.31	0.33	0.32
			SB	0.34	0.35	0.34
13042-003	I-94 BL from I-69 to US-27 in Marshall	Conc	EBOL	0.30	0.35	0.33
		Bit	EBIL	0.42	0.43	0.42
		Conc	WBOL	0.33	0.34	0.33
		Bit	WBIL	0.41	0.43	0.42
13121E, C3	I-94 BL (Dickman Rd.) from W. Limits of Battle Creek E. to Upton Avenue	Conc	EBOL	0.32	0.35	0.33
			EBIL	0.33	0.35	0.34
		Bit	WBOL	0.52	0.53	0.52
			WBIL	0.56	0.59	0.58
19-41, C5 (Control 19031)	SB US-27, S. of St. Johns, from a point 0.5 mile N. of Centerline Road, S. 0.5 mile.	Conc	SBOL	0.27	0.33	0.30
			SBIL	Not Tested		
21022-05203A	US-2 - US-41 - M-35 from 250 ft N. of C&NW RR intermittently to 1.2 miles N. of the Escanaba River	4-Lane Roadway at Danforth Road				
		Bit	EBOL	0.30	0.31	0.30
			EBIL	0.40	0.42	0.41
			WBOL	0.39	0.42	0.40
			WBIL	0.30	0.33	0.32
		South of Escanaba River				
		Bit	EBOL	0.32	0.36	0.34
			EBIL	0.42	0.44	0.43
		1 Mile North of Escanaba River				
		Bit	WBOL	0.43	0.46	0.45
			WBIL	0.43	0.46	0.45
S09 of 25131	I-75 under Fenton Road, 2.4 miles SE of US-23	Latex Conc	NBOL	0.33	0.36	0.35
			NBIL	0.36	0.41	0.39
			SBOL	0.33	0.39	0.35
			SBIL	0.37	0.40	0.38

Project Number	Location	Surface Type	Directon and Lane	Coefficient of wsf Low	High	Avg.
30071-03802A (Part)	US-127 from 565 ft N. of Cincinatti Northern RR N'ly to 3735 ft N. of M-34	South from M-34				
		Bit	NB	0.30	0.33	0.31
			SB	0.34	0.34	0.34
		North of M-34				
		Bit	NB	0.39	0.39	0.39
			SB	0.40	0.43	0.42
33011B, C3	M-99 from I-96 NE'ly to Jolly Road (S. Limits of Lansing)	Conc	NBOL	0.31	0.35	0.33
		Bit	NBIL	0.44	0.47	0.45
		Conc	SBOL	0.33	0.35	0.34
		Bit	SBIL	0.47	0.49	0.48
33034-011	US-27 from 798 ft S. of Douglas St., N. to N. of Northcrest Rd.	Bit	NBOL	0.30	0.34	0.32
			NBIL	0.38	0.41	0.39
			SBOL	0.34	0.34	0.34
			SBIL	0.38	0.42	0.39
33044-037	I-496 from Waverly Rd., E. to W. of Middle Street, City of Lansing	Conc	EBOL	0.25	0.28	0.27
			EBIL	0.29	0.31	0.30
			WBOL	0.28	0.32	0.30
			WBIL	0.32	0.35	0.34
33045D, C1	I-496 from S. of Cavanaugh Rd. N. to N. of Cavanaugh Road	Conc	NBOL	0.33	0.34	0.33
			NBIL	0.33	0.35	0.34
			SBOL	0.30	0.34	0.32
			SBIL	0.39	0.40	0.40
33045B, C2	I-496 from N. of Cavanaugh Rd. to S. of Mt. Hope Avenue	Conc	NBOL	0.30	0.31	0.30
			NBIL	0.36	0.38	0.37
			SBOL	0.34	0.36	0.35
			SBIL	0.40	0.41	0.40
33045F, C3	I-496 from S. of Mt. Hope Ave. to N. of Mt. Hope Avenue	Conc	NBOL	0.34	0.36	0.35
			NBIL	0.34	0.37	0.36
			SBOL	0.35	0.35	0.35
			SBIL	0.41	0.42	0.42
33045A, C4	I-496 fromN. of Mt. Hope Ave. N. to S. of the Red Cedar River	Conc	NBOL	0.33	0.36	0.34
			NBIL	0.39	0.40	0.39
			SBOL	0.31	0.35	0.32
			SBIL	0.39	0.41	0.40
33061-020	M-43 from W. of Catherine St. E. to Logan Street	Conc	WBOL	0.27	0.30	0.28
			WBCL	0.27	0.30	0.29
			WBIL	0.24	0.25	0.25

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
33082-019	M-43 (Grand River Ave.) from 241.5 ft E. of Hagadorn Rd. in East Lansing SE to bridge over GTW RR	Bit	EBOL	0.32	0.34	0.33
			EBIL	0.32	0.35	0.33
			WBOL	0.32	0.37	0.35
			WBIL	0.37	0.40	0.39
S04 of 33083	I-96 over Cedar Street-Pennsylvania Avenue Access Road	Epoxy Mortar	EBRT	0.34	0.37	0.36
			EBOL	0.47	0.48	0.47
			EBIL	0.46	0.49	0.47
			WBOL	0.37	0.39	0.38
			WBIL	0.28	0.30	0.29
33171A, C1	US-27 from S. of the Red Cedar River to N. of the Red Cedar River	Conc	NBOL	0.33	0.36	0.35
			NBIL	0.34	0.36	0.35
			SBOL	0.33	0.33	0.33
			SBIL	0.38	0.38	0.38
33171B, C2	US-27 from N. of the Red Cedar River, N. to S. City Limits of Lansing	Conc	NBOL	0.32	0.33	0.33
			NBIL	0.34	0.37	0.36
			SBOL	0.30	0.31	0.30
			SBIL	0.32	0.33	0.33
33171-025	US-27 from the Red Cedar River N. to S. of Woodruff Avenue, City of Lansing	Conc	NBOL	0.31	0.34	0.33
			NBIL	0.33	0.36	0.34
			SBOL	0.31	0.32	0.32
			SBIL	0.34	0.36	0.35
38051-03670A (Part)	I-94 BL (Michigan Avenue) from Durand St., E'ly to 110 ft E. of Fourth Street	Bit	EBOL	0.34	0.36	0.35
			EBIL	0.43	0.44	0.43
			WBOL	0.36	0.40	0.37
			WBIL	0.41	0.44	0.43
S04 of 41026	M-37 over EB I-96	Latex Modified Mortar	NBOL	0.38	0.41	0.40
			NBIL	0.40	0.43	0.41
			SBRT	0.33	0.34	0.34
			SBOL	0.34	0.36	0.35
			SBIL	0.37	0.39	0.38
S05 of 41026	M-37 over WB I-96	Latex Modified Mortar	NBOL	0.39	0.41	0.40
			NBIL	0.38	0.40	0.39
			SBRT	0.39	0.39	0.39
			SBOL	0.34	0.35	0.34
			SBIL	0.40	0.41	0.40
41029A, C35	I-96 from Ottawa County Line NE. 1.779 miles	Conc	NBOL	0.30	0.33	0.31
			NBIL	0.37	0.38	0.37
			SBOL	0.37	0.37	0.37
			SBIL	0.34	0.34	0.34

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
41042-02999A	M-21 BR from LaRue St., NE'ly to 453 ft NE of Roys Avenue	Bit	NBOL	0.38	0.41	0.39
			NBIL	0.54	0.56	0.55
			SBOL	0.33	0.35	0.34
			SBIL	0.49	0.53	0.51
46061D, C6	M-52 from US-223 N'ly to S. Limits of Adrian	Conc	NBOL	0.31	0.33	0.32
			NBIL	0.31	0.33	0.32
			SBOL	0.27	0.28	0.27
			SBIL	0.27	0.30	0.29
46071A, C1	M-52 from Ohio State Line N'ly to US-223	Conc	NB	0.33	0.37	0.35
			SB	0.38	0.40	0.39
50051-03955A	SB US-25 (Gratiot Ave.) from 400 ft S. of Iroquois Ave., NE'ly to Wellington-Crescent	Conc	SBOL	0.31	0.36	0.34
			SB#3	0.29	0.33	0.31
			SB#2	0.38	0.40	0.39
			SBIL	0.36	0.40	0.38
50111J, C13	I-94 from S. of Joy Blvd. to N. of Cotton Road	Conc	NBOL	0.31	0.34	0.33
			NBCL	0.37	0.42	0.39
			NBIL	0.40	0.40	0.40
			SBOL	0.31	0.33	0.32
			SBCL	0.36	0.38	0.37
			SBIL	0.40	0.42	0.41
52042E, C8	US-41 - M-28, Marquette Bypass	Conc	EBOL	0.31	0.33	0.32
			EBIL	0.45	0.47	0.46
			WBOL	0.38	0.40	0.39
			WBIL	0.43	0.44	0.43
56023A, C10	M-20 (Buttles St.) from Eastman SE'ly to 2nd St., and from intersection of Eastman and Hines SE'ly to intersection of Jerome and Indian Streets	Conc	EBOL	0.33	0.34	0.34
			EBCL	0.33	0.34	0.33
			EBIL	0.35	0.38	0.36
56023A, C11	M-20 (Indian St.) from Jerome St. S'ly to First Street	Bit	WBOL	0.41	0.44	0.42
			WBCL	0.35	0.38	0.37
			WBIL	0.41	0.43	0.42
61073-02995A	US-31 BR (Colby St.) from 140 ft W. of Franklin St., in Whitehall, E'ly to US-31	From US-31 NW to City Limits				
		Bit	NB	0.24	0.28	0.26
			SB	0.25	0.26	0.26
		From City Limits NW to Franklin St.				
		Bit	NBOL	0.35	0.36	0.36
			NBIL	0.35	0.37	0.36
			SBOL	0.31	0.33	0.32
			SBIL	0.33	0.35	0.34

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
61075E, C5	US-31 from Marcoux Street N. to N. Limits of Muskegon	Bit	NBOL	0.33	0.36	0.35
			NBIL	0.36	0.37	0.37
			SBOL	0.32	0.34	0.33
			SBIL	0.44	0.46	0.45
61075A, C6	US-31 fromN. Limits of Muskegon N. to US-31 BR	Bit	NBOL	0.32	0.34	0.33
			NBIL	0.34	0.36	0.35
			SBOL	0.35	0.37	0.36
			SBIL	0.42	0.44	0.43
61153A, C1	US-31 BR from Spring Street NE. to Getty Street	Bit	NBOL	0.33	0.34	0.33
			NB#3	0.34	0.36	0.35
			NB#2	0.32	0.35	0.34
			NBIL	0.34	0.38	0.36
			SBOL	0.33	0.35	0.34
			SB#3	0.32	0.34	0.33
			SB#2	0.31	0.36	0.33
			SBIL	0.41	0.44	0.42
61153B, C2	US-31 BR from Getty Street NE to US-31	Bit	NBOL	0.30	0.32	0.31
			NBIL	0.41	0.43	0.42
			SBOL	0.39	0.40	0.39
			SBIL	0.38	0.42	0.40
62031, C10	M-37 - M-46 from S. Limits of Newaygo N. to Wood Street in Newaygo	From South Limits of Newaygo N. to Main Street				
		Conc	NBOL	0.30	0.34	0.32
		Bit	NBIL	0.48	0.49	0.49
		Conc	SBOL	0.27	0.32	0.29
		Bit	SBIL	0.48	0.49	0.49
S01 of 63022	I-96 over Kent Lake Road	Latex Mortar	EBOL	0.31	0.34	0.33
			EBCL	0.32	0.36	0.34
			EBIL	0.40	0.42	0.41
			WBOL	0.32	0.37	0.35
			WBCL	0.33	0.35	0.34
			WBIL	0.37	0.42	0.39
S02 of 63022	I-96 over Milford Road	Latex Mortar	EBOL	0.22	0.26	0.24
			EBCL	0.27	0.32	0.30
			EBIL	0.28	0.32	0.31
			WBOL	0.21	0.26	0.23
			WBCL	0.30	0.31	0.31
			WBIL	0.33	0.34	0.34

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
63031-017	US-24 (Telegraph Rd.) from I-696 N'ly to 1220 ft N. of 12 Mile Rd., City of Southfield	Conc	NBOL	0.41	0.44	0.42
			NB#3	0.36	0.37	0.37
			NB#2	0.44	0.46	0.45
			NBIL	0.35	0.40	0.38
			SBOL	0.32	0.33	0.33
			SB#3	0.33	0.35	0.34
			SB#2	0.34	0.34	0.34
			SBIL	0.33	0.38	0.35
63071-04780A	M-15 from 8.279 miles S. of Genesee County Line N'ly to County Line	At Rattalee Lake Road				
		Bit	NB	0.34	0.38	0.35
			SB	0.42	0.45	0.43
63172A, C1	I-75 from N. of Auburn Rd. to S. of Walton Blvd.	Conc	NBOL	0.34	0.35	0.34
			NBIL	0.37	0.37	0.37
			SBOL	0.30	0.31	0.30
			SBIL	0.35	0.39	0.37
63174E, C2	I-75 from W. of M-150, W&N to a point N. of 17 Mile Road	Conc	NBOL	0.33	0.34	0.33
			NBCL	0.39	0.42	0.40
			NBIL	0.38	0.41	0.39
			SBOL	0.38	0.39	0.38
			SBCL	0.43	0.45	0.44
			SBIL	0.47	0.48	0.47
63174F, C3	I-75 from S. of E. Long Lake Rd., N'ly & NW'ly to E. of Adams Road	Conc	NBOL	0.32	0.33	0.33
			NBCL	0.37	0.40	0.39
			NBIL	0.38	0.39	0.39
			SBOL	0.30	0.31	0.31
			SBCL	0.33	0.37	0.35
			SBIL	0.36	0.37	0.36
63174G, C4	I-75 from E. of Adams Road W'ly and N'ly to Auburn Road	Dual 36 ft Portion				
		Conc	NBOL	0.32	0.38	0.34
			NBCL	0.34	0.35	0.34
			NBIL	0.33	0.40	0.36
			SBOL	0.27	0.33	0.30
			SBCL	0.31	0.32	0.31
			SBIL	0.32	0.35	0.34
		Dual 24 ft Portion				
		Conc	NBOL	0.35	0.38	0.36
			NBIL	0.37	0.40	0.39
			SBOL	0.31	0.33	0.32
			SBIL	0.34	0.35	0.34

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
63174I, C5 63174D, C14	I-75 from Sprague Ave. in Royal Oak, N. to 0.5 mile S. of 13 Mile Road in Madison Heights	Conc	NBOL	0.27	0.27	0.27
			NBCL	0.27	0.28	0.28
			NBIL	0.32	0.33	0.32
			SBOL	0.29	0.30	0.29
			SBCL	0.31	0.32	0.32
			SBIL	0.30	0.35	0.32
63174I, C7	I-75 from 14 Mile Road to N. of 15 Mile Road	Conc	NBOL	0.32	0.35	0.34
			NBCL	0.35	0.38	0.36
			NBIL	0.36	0.38	0.37
			SBOL	0.33	0.34	0.33
			SBCL	0.34	0.37	0.35
			SBIL	0.37	0.38	0.37
63174E, C8	I-75 from N. of 15 Mile Road N. and W. to W. of M-150	Conc	NBOL	0.32	0.33	0.33
			NBCL	0.36	0.39	0.38
			NBIL	0.40	0.41	0.41
			SBOL	0.34	0.36	0.35
			SBCL	0.37	0.39	0.38
			SBIL	0.41	0.43	0.42
73051D, C2	M-13 from S. Limits of Saginaw N. to Washington Street	Bit	NB	0.30	0.34	0.33
			SB	0.32	0.37	0.34
78011-04785A (Part)	US-131 from State Line, North to US-12	Bit	NB	0.35	0.38	0.37
			SB	0.31	0.34	0.33
78022A, C1	US-12 in Village of White Pigeon	Bit	EBOL	0.38	0.42	0.40
			EBIL	0.34	0.37	0.35
			WBOL	0.42	0.46	0.44
			WBIL	0.33	0.36	0.34
81012-03965A	M-52 from Auburn St., in Manchester N'ly to 1600 ft N. of Pleasant Lake Road	Bit	NB	0.34	0.35	0.34
			SB	0.38	0.41	0.40
S02 of 82022	EB I-94 over Wayne Road	Latex Conc	EBOL	0.30	0.31	0.30
			EBCL	0.31	0.34	0.33
			EBIL	0.37	0.39	0.38
S03 of 82022	WB I-94 over Wayne Road	Latex Modified Mortar	WBOL	0.39	0.43	0.41
			WBCL	0.28	0.32	0.30
			WBIL	0.29	0.31	0.30
S06 of 82022	WB I-94 over Middlebelt Road	Latex Modified Mortar	WBOL	0.30	0.33	0.31
			WBCL	0.33	0.34	0.34
			WBIL	0.33	0.37	0.35

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
S12 of 82022	WB I-94 over Beech-Daly Road	Latex	WBOL	0.32	0.34	0.33
		Modified	WBCL	0.36	0.37	0.37
		Mortar	WBIL	0.36	0.38	0.37
X01 of 82022	EB I-94 over Shook Road and RR	Latex	EBOL	0.31	0.35	0.32
		Modified	EBCL	0.34	0.36	0.35
		Mortar	EBIL	0.38	0.39	0.38
X02 of 82022	WB I-94 over Shook Rd and RR	Latex	WBOL			*
		Modified	WBCL	0.28	0.29	0.29
		Mortar	WBIL	0.30	0.32	0.31
82052B, C15	US-24 from Eureka Road N. to S. of Northline Road	Conc	SBOL	0.31	0.34	0.33
			SBCL	0.34	0.35	0.34
			SBIL	0.34	0.35	0.35
82061-03987A	US-12 (Michigan Ave.) from 250 ft W. of Denton Rd., E'ly to Weithoff Road in Inkster, omitting from the C&O RR overpass at the W. city limits of Wayne to 4th St., in Wayne	West of C&O RR				
		Bit	EBOL	0.30	0.31	0.32
			EBIL	0.38	0.38	0.38
			WBOL	0.41	0.43	0.42
			WB#3	0.34	0.38	0.36
			WB#2	0.40	0.43	0.42
			WBIL	0.40	0.49	0.45
		West of Newberry Road				
		Bit	WBOL	0.34	0.35	0.34
			WBIL	0.41	0.42	0.42
		East of Howe Road				
		Bit	EBOL	0.28	0.32	0.30
			EBIL	0.34	0.35	0.35
			WBOL	0.34	0.36	0.35
			WBIL	0.32	0.35	0.33
82071-02563A	M-85 - US-25 from Toronto Street N'ly and NE'ly to Clark Street in Detroit	SW from Clark Street				
		Bit	NBOL	0.33	0.36	0.34
			NBIL	0.39	0.42	0.40
			SBOL	0.31	0.34	0.32
			SBIL	0.45	0.46	0.45
		West from I-75 Overpass				
		Bit	NBOL	0.36	0.39	0.38
			NBCL	0.34	0.38	0.36
			NBIL	0.32	0.35	0.34
			SBOL	0.41	0.44	0.43
			SBCL	0.35	0.36	0.36
			SBIL	0.49	0.50	0.49
82081-022 (01193A)	M-153 (Ford Rd.) from 60 ft E. of Lafayette St., E'ly to 200 ft E. of Hawthorne	Conc	EBOL	0.31	0.33	0.32
			EBCL	0.31	0.34	0.33
			EBIL	0.37	0.40	0.38

(*) Not tested - Lane Barricaded Off.

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
82191D, C9	I-75 from S. of Sibley Rd., N. to N. of Penn Road	Conc	NBOL	0.29	0.31	0.30
			NBCL	0.34	0.35	0.35
			NBIL	0.34	0.35	0.35
			SBOL	0.30	0.31	0.30
			SBCL	0.35	0.37	0.36
			SBIL	0.39	0.41	0.40
82194K, C31	I-75 (Fisher Expressway) from E. of W. Grand Blvd. NE to S. of Vernor Highway	Conc	NBOL	0.33	0.37	0.35
			NB#4	0.31	0.34	0.32
			NB#3	0.36	0.37	0.36
			NB#2	0.39	0.40	0.40
			NBIL	0.44	0.46	0.45
			SBOL	0.40	0.43	0.42
			SB#4	0.34	0.38	0.36
			SB#3	0.32	0.37	0.35
			SB#2	0.37	0.40	0.38
			SBIL	0.38	0.42	0.40
82195B, C19 82195D, C20 82251B, C45	I-75 (Fisher Freeway) from the Lodge Freeway to St. Antoine Street	Conc	EBOL	0.36	0.41	0.39
			EB#3	0.35	0.36	0.36
			EB#2	0.37	0.42	0.40
			EBIL	0.38	0.45	0.42
			WBOL	0.40	0.41	0.41
			WB#3	0.36	0.37	0.37
			WB#2	0.36	0.39	0.37
			WBIL	0.36	0.40	0.37
82251-054	I-75 (Chrysler Expressway) from Piquette Avenue to Clay Avenue	Conc	NBOL	0.40	0.42	0.41
			NB#3	0.35	0.40	0.37
			NB#2	0.43	0.46	0.44
			NBIL	0.47	0.48	0.48
			SBOL	0.40	0.41	0.40
			SB#3	0.37	0.40	0.38
			SB#2	0.38	0.44	0.41
			SBIL	0.42	0.48	0.44
82271A, C2	I-75 Connector from N. of Penn Rd. to N. of Eureka Road	Conc	NBOL	0.26	0.30	0.28
			NBIL	0.34	0.36	0.35
			SBOL	0.28	0.30	0.29
			SBIL	0.35	0.38	0.36
83012-04995A	M-115 - M-37, West of Mesick	Bit	EBOL	0.36	0.40	0.39
			EBIL	0.38	0.42	0.39
			WBOL	0.42	0.46	0.44
			WBIL	0.33	0.34	0.34

Project Number	Location	Surface Type	Direction and Lane	Coefficient of wsf Low	High	Avg.
2 SC-5B (Control 41031)	M-37 from S. of 108th Street, N'ly 4.87 miles to S. of Kraft Road	S. of Kraft Road (North end of project)				
		Bit	NB	0.34	0.47	0.41
			SB	0.31	0.38	0.35
		North of Caledonia				
		Bit	NB	0.35	0.53	0.43
			SB	0.37	0.52	0.45