MEMORANDUM/CORRESPONDENCE _____ Wisc/ Pavements Section

Peter Dwight Roger Mike
Dave Scot Ray Deb

DATE: April 4, 1997

TO: District Directors
Transportation District #___
Attn.: District, Chief Construction Engineer

FROM: Bill Duckert, P.E.
Pavement Management Engineer

PAA for Bill

SUBJECT: 1996 New Construction Ride Quality Measurements

Each year the Pavements Section of the Bureau of Highway Construction measures the ride of newly constructed pavements. Attached for your review are several copies of the 1996 New Construction Ride Quality Measurements Report. The data in this report is in units of International Roughness Index(IRI). IRI values close to zero indicate an excellent ride while values above 4.5 indicate a very poor ride.

The testing procedures and test equipment are identical to last year's. The 1996 new construction ride quality measurements were conducted on projects completed before December 15, 1996. A total of 74 projects (61 AC and 13 PCC) were tested, representing 985 lane miles. This year's new construction data shows that AC pavements averaged 1.02 IRI and the PCC pavements averaged 1.41. The results do not indicate a significant change in ride quality between 1995 and 1996 data.

There were 19 AC projects reported under the State Highway Rehabilitation - Maintenance (SHRM) program. SHRM projects represents 20.8% of the AC lane miles tested this year. The average ride quality of 1.22 IRI for SHRM is lower than the overall AC average of 1.02 IRI. Detailed information is shown in the attachments.

The five-year trend analysis indicates a fairly steady performance in ride quality of newly constructed pavements for both AC and PCC pavements. The table on page two of this report shows that in the last three years there has been no major change in ride quality of newly constructed pavements. The low point in figure 1, occurring in 1993, may be due to the transition from the first generation of profiler to the second.

Please make this report available to all interested parties. Your comments concerning the data shown in this report are appreciated. We will be pleased to answer any questions concerning this report or ride quality measurements in general. Contact Peter A. Amakobe (pamakobe, 608 246-5308) if you have questions.

Attachments

cc: Gary Whited
Mark Wolfgram
Randy Wade
David Vieth
Bill Sheppard
Dennis Brush
Kevin McMullen

PROFILER ROAD MEASUREMENTS

1996 CONSTRUCTION PROJECTS

FIVE YEAR AVERAGES

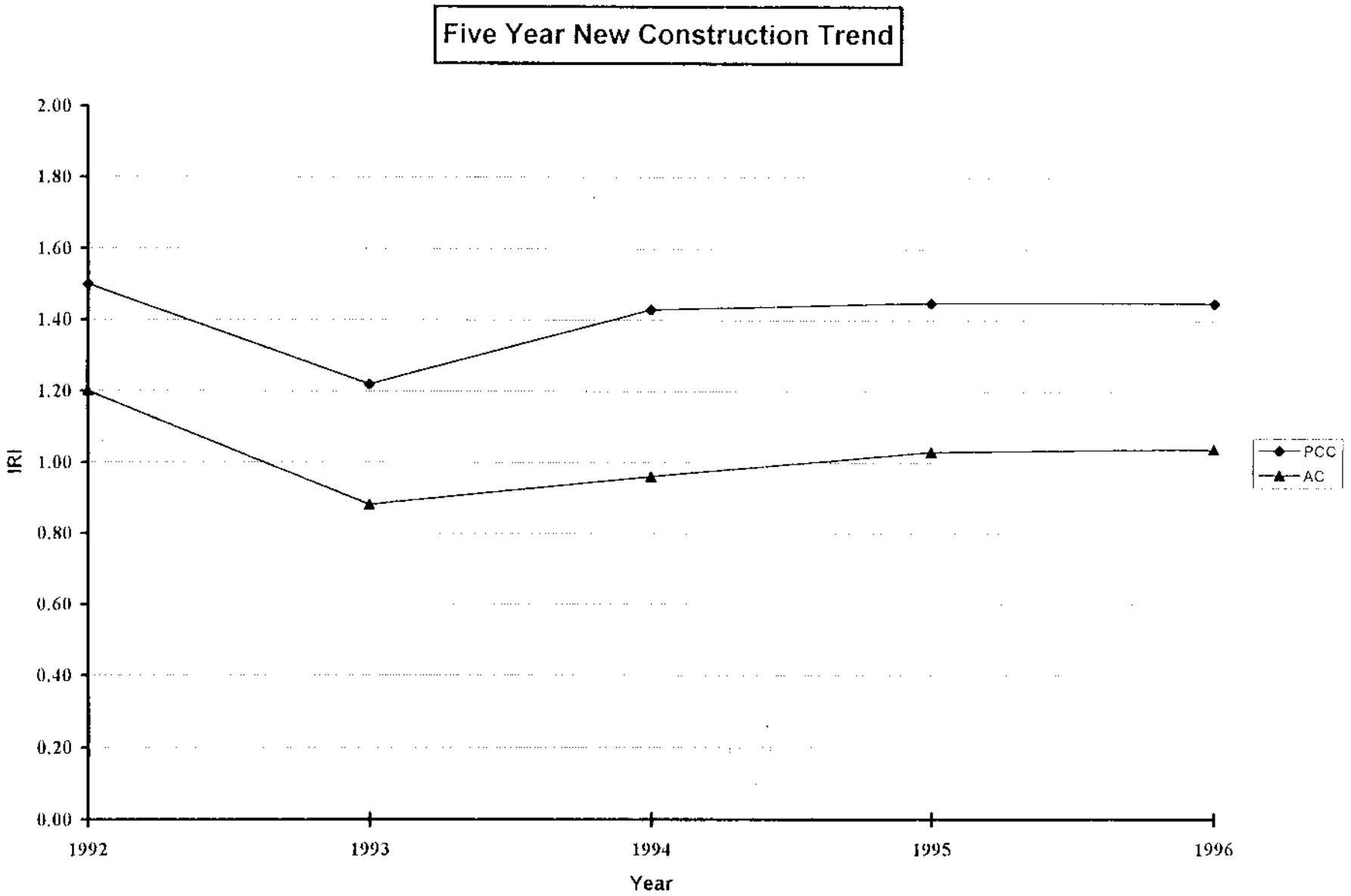
Portland Cement Concrete Pavements

CONSTRUCTION Year	Average IRI
1992	1.50
1993	1.22
1994	1.43
1995	1.45
1996	1.45
5–Year Average	1.41

Hot Mix Asphaltic Concrete Pavements

CONSTRUCTION Year	Average IRI
1992	1.20
1993	0.88
1994	0.96
1995	1.03
1996	1.04
5–Year Average	1.02

* IRI is reported in m/km


Five Year New Construction Trend
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
IRI
1992
1993
1994
1995
1996
Year
PCC
AC

PROFILER ROAD MEASUREMENTS

1996 CONSTRUCTION PROJECTS

AVERAGE BY DISTRICT

Portland Cement Concrete Pavements

District	Lane Miles	No. of Projects	Average IRI
1	49.04	5	1.51
4	47.80	4	1.46
5	18.19	1	1.32
6	5.01	1	1.62
7	46.35	2	1.39
TOTAL	166.39	13.00	1.45

Hot Mix Asphaltic Concrete Pavements

District	Lane Miles	No. of Projects	Average IRI
1	62.11	7	1.04
2	97.57	8	1.01
3	118.16	6	1.03
4	44.03	3	1.00
5	220.69	21	1.12
6	187.28	10	1.01
7	26.92	2	0.95
8	62.13	4	1.02
TOTAL	818.88	61	1.04

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

1996 CONSTRUCTION PROJECTS

AVERAGE BY CONTRACTOR

Portland Cement Concrete Pavement

Contractor	Lane Miles	No. of Projects	Average IRI
Trierweiler	45.92	5	1.43
Streu Const Co.	35.04	2	1.34
James Cape & Sons	33.40	3	1.46
Zignego	22.54	2	1.69
Vinton	29.49	1	1.41
TOTAL	166.39	13	1.45

Hot Mix Asphaltic Concrete Pavement

Contractor	Lane Miles	No. of Projects	Average IRI
Northeast Asphalt	97.61	7	1.06
Monarch Paving	7.73	1	1.13
Mathy Construction	442.14	31	1.05
B.R. Amon & Sons	124.76	7	1.05
American Asphalt	9.70	1	1.00
Rock Road of Wisc	30.47	2	1.04
Payne & Dolan	59.35	5	0.93
Murphy Construction Co	34.09	4	0.93
Clark County	11.93	2	1.22
D.L. Gasser	1.11	1	1.87
TOTAL	818.88	61	1.04

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

1996 CONSTRUCTION PROJECTS

AVERAGE BY SURFACE TYPE

Portland Cement Concrete Pavements

Type	Lane Miles	No. of Projects	Average IRI
PCC Pavements	166.39	13	1.45

(All PCC New Construction Projects used Slip–Form)

Hot Mix Asphaltic Concrete Pavements

Type	Lane Miles	No. of Projects	Average IRI
Special Mix	13.40	1	0.87
SMA	87.75	3	1.09
High Volume	243.40	12	0.99
Medium Volume	348.06	29	0.99
Low Volume	126.28	16	1.30
	818.88	61	1.04

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

1996 CONSTRUCTION PROJECTS

AVERAGE BY CONSTRUCTION TECHNIQUE

Portland Cement Concrete Pavements

Type of Technique		No. of Projects	Lane Miles Tested	AVG IRI
Doweling:				
	Basket	9	77.39	1.56
	Inserter	4	89.00	1.35
Surface Depth:				
Doweled				
	9.0"	4	34.71	1.31
	10.0"	6	84.02	1.57
	12.0"	3	47.67	1.33
Base:				
	OGBC	9	138.05	1.41
	DGBC	4	28.35	1.64
Joint Spacing:				
	Random (Rural)	10	139.61	1.40
	20' (Urban)	3	26.78	1.71

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

1996 CONSTRUCTION PROJECTS

AVERAGE BY CONSTRUCTION TECHNIQUE

Hot Mix Asphaltic Concrete Pavements

Type of Technique	No. of Proj.	Mileage	AVG IRI
Depth:			
7.00"	3	43.59	0.93
6.00"	2	75.61	1.03
5.50"	2	15.79	1.17
5.00"	6	106.56	0.92
4.50"	4	51.28	0.99
4.00"	2	30.47	1.04
3.75"	2	12.17	0.99
3.50"	5	71.55	1.03
3.00"	17	216.55	1.06
2.75"	1	5.91	1.44
2.50"	8	62.69	1.26
2.25"	1	14.42	0.91
1.75"	1	12.20	1.51
1.50"	5	99.72	1.04
Paved Over:			
New Base	9	67.11	1.14
Old AC	9	103.82	1.05
Milled	27	365.60	1.05
Old PCC	7	183.82	1.05
OGBC	5	51.01	0.94
Rubbleize	4	47.52	1.04

* IRI is reported in m/km

WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

HOT MIX ASPHALTIC CONCRETE PAVEMENT
ROAD PROFILER MEASUREMENTS
NEW CONSTRUCTION -- 1996

District	County	Project	Highway Number	Name of Road	Paving Contractor	Lane-Miles	IRI		Wearing Surface				Total AC Thick (inches)	Paved Over
							Std Dev	Proj	Recycled	SMA	1-HV 2-MV 3-LV	Spec Mix		1-Milled 2-Old PCC 3-New Base 4-Rubblize 5-Open Grade 6-Dense Grade 7-Old AC 8-Crack & Seat
1	Dane	5411-01-74	USH 51	East Madison Beltline	Payne & Dolan	5.68	0.41	1.21			1		5.50"	4
1	Sauk	5988-02-31	STH 123	Walnut St. & Parkway	D.L. Gasser	1.11	0.00	1.87			2		5.00"	3
1	Dodge	1111-08-84	USH 151	Beaver Dam - Waupun	Northeast Asphalt	7.72	0.26	1.28			1		3.00"	2
2	Racine	2240-07-77	STH 36	Loomis Rd	Payne & Dolan	16.22	0.40	0.89			1		7.00"	5
2	Racine	2240-07-78	STH 36	Loomis Rd	Payne & Dolan	12.27	0.34	0.74			1		7.00"	5
2	Racine	2250-06-70	STH 20	Washington Ave	Payne & Dolan	13.78	0.20	1.05			1		4.00"	2
2	Walworth	3120-00-72	USH 12	Whitewater - Elkhorn	B.R. Amon & Sons	15.10	0.39	1.12			1		7.00"	5
2	Racine	2241-03-70	STH 83	South Pine Street	B.R. Amon & Sons	2.42	0.04	1.01			2		3.75"	1
2	Fond Du Lac	1430-00-71	STH 23	Ripon - Rosendale	Northeast Asphalt	15.83	0.36	0.83			1		4.50"	2
2	Fond Du Lac	6110-00-60	STH 44	Ripon - Oshkosh	Northeast Asphalt	9.75	0.27	0.98			2		3.75"	3
3	Calumet	4085-09-71	STH 32	New Holstein - Chilton	B.R. Amon & Sons	11.34	0.60	1.13			2		6.00"	3
3	Manitowoc	1225-02-71	IH 43	STH 310 - STH 96	B.R. Amon & Sons	64.28	0.22	1.01			1		6.00"	2
3	Winnebago	6432-05-71	USH 45	CTH JJ - North County Line	Murphy Construction Co	12.25	0.26	0.89			2		3.00"	1
3	Outagamie	6430-01-72	USH 45	South County Line - USH 10	Murphy Construction Co	3.88	0.07	0.96			2		5.00"	5
3	Outagamie	1146-10-72	USH 45	USH 10 - STH 76	Murphy Construction Co	3.54	0.02	1.11			2		5.00"	5
3	Winnebago	1120-17-72	USH 41	Lake Butte Des Mort - Neenah	Northeast Asphalt	22.88	0.39	1.11		X			5.00"	1
4	Waupaca	6220-04-71	STH 54	STH 22/110 - USH 45	Rock Road of Wisc	19.50	0.20	0.99			1		3.50"	1
4	Waupaca	6580-05-60	STH 156	STH 22 - East County Line	Murphy Construction Co	14.42	0.16	0.91			2		2.25"	1
4	Waupaca	6250-02-71	STH 22	Clintonville - Shawano County Line	Northeast Asphalt	10.11	0.40	1.15			2		5.50"	3

WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

HOT MIX ASPHALTIC CONCRETE PAVEMENT
ROAD PROFILER MEASUREMENTS
NEW CONSTRUCTION – 1996

District	County	Project	Highway Number	Name of Road	Paving Contractor	Lane-Miles	IRI		Wearing Surface				Total AC Thick (Inches)	Paved Over 1-Milled 2-Old PCC 3-New Base 4-Rubbleize 5-Open Grade 6-Dense Grade 7-Old AC 8-Crack & Seat
							Std Dev	Proj	Recycled	SMA	1-HV 2-MV 3-LV	Spec Mix		
5	Jackson	7552-03-71	STH 54	Irving – Black River Falls	Mathy Construction	16.69	0.17	1.03			2		4.00"	1
5	LaCrosse	1071-06-71	IH 90	Minnesota State Line – STH 157	Mathy Construction	17.35	0.26	1.12			1		4.50"	2
5	Vernon	5043-01-71	STH 80	Cornhill Rd – Hillsboro	Mathy Construction	5.57	0.21	1.13	X		2		3.50"	1
5	Vernon	5103-01-71	STH 33/82	Ontario – Hillsboro	Mathy Construction	7.99	0.35	1.14	X		2		3.50"	1
5	Monroe	5134-09-71	STH 131	Ontario – Wilton	B.R. Amon & Sons	8.30	0.46	1.26	X		2		4.50"	1
5	Monroe	7571-08-71	STH 16	West County Line – Sparta	Mathy Construction	5.17	0.57	0.88			2		3.00"	4
5	Jackson	7510-04-71	STH 54	Black River Falls – City Point	Mathy Construction	49.46	0.27	0.76	X		2		5.00"	1
6	Eau Claire	1028-05-78	IH 94	Mallard Rd – CTH NN	Mathy Construction	35.35	0.34	0.92	X		1		3.00"	1
6	Eau Claire	1022-00-71	IH 94	Chippewa River – USH 53	Mathy Construction	20.32	0.29	0.93			1		3.00"	1
6	Pepin	7180-09-75	STH 35	Stockholm – Pepin	Mathy Construction	13.40	0.17	0.87				X	3.00"	1
6	Chippewa	8191-00-70	STH 64	Bloomer – Cornell	Mathy Construction	9.81	0.23	0.81			2		4.50"	1
6	Pierce	1530-08-71	USH 10	CTH A – East County Line	Mathy Construction	25.70	0.31	0.99			2		5.00"	4
6	Chippewa	1192-02-72	USH 53	CTH B – CTH F	Mathy Construction	26.76	0.38	1.03		X			1.50"	2
6	Chippewa	1192-02-73	USH 53	CTH F – North County Line	Mathy Construction	38.11	0.15	1.12		X			1.50"	2
6	Pepin	7871-03-71	CTH N	Ella – CTH SS	Mathy Construction	5.91	0.00	1.44			3		2.75"	3
6	Clark	7836-05-70	CTH P	CTH K – CTH N	Clark County	5.99	0.00	1.19			3		2.50"	7
6	Clark	7837-03-70	CTH E	CTH N – STH 29	Clark County	5.95	0.02	1.25			3		2.50"	7
7	Lincoln	9675-11-70	BUS 51	USH 51 – Joe Snow Rd	American Asphalt	9.70	0.40	1.00			2		3.00"	1
7	Vilas	9230-10-60	STH 47	Woodruff – Flambeau	B.R. Amon & Sons	17.22	0.29	0.92			2		1.50"	7
8	Barron	8120-07-71	STH 48	STH 25 – Rice Lake	Monarch Paving	7.73	0.05	1.13			2		3.00"	7
8	Polk	8060-05-71	STH 35	Osceola – USH 8	Mathy Construction	18.79	0.29	1.16			2		3.50"	7
8	Rusk	1580-13-71	USH 8	Ladysmith – Glenflora	Mathy Construction	19.70	0.10	0.87			2		3.50"	7
8	Rusk	1582-03-71	USH 8	Bruce – Ladysmith	Mathy Construction	15.92	0.24	0.97			2		1.50"	7

WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

HOT MIX ASPHALTIC CONCRETE PAVEMENT
ROAD PROFILER MEASUREMENTS
NEW CONSTRUCTION - 1996

MAINTENANCE PROJECTS

District	County	Project	Highway Number	Name of Road	Paving Contractor	Lane-Miles	IRI Std Dev	IRI Proj	Wearing Surface Recycled	Wearing Surface SMA	Wearing Surface 1-HV 2-MV 3-LV	Wearing Surface Spec Mix	Total AC Thick (Inches)	Paved Over 1-Milled 2-Old PCC 3-New Base 4-Rubblize 5-Open Grade 6-Dense Grade 7-Old AC 8-Crack & Seat
1	Dane/Rock	5924-00-60	STH 138	STH 59 – Stoughton	Payne & Dolan	11.40	0.30	0.91			2		3.00"	1
1	Dane/Jeff	3576-06-60	STH 106	Albion – Fort Atkinson	B.R. Amon & Sons	6.11	0.14	1.27			2		3.00"	1
1	Rock/Green	5320-01-60	STH 104	Broadhead – Evansville	Rock Road of Wisc	10.98	0.63	1.13			2		3.00"	4
1	Dodge	6070-00-60	STH 68	Fox Lake – Waupun	Northeast Asphalt	19.12	0.22	0.80			2		3.00"	1
2	Fond Du Lac	4070-05-60	USH 45	West Bend – Fond Du Lac	Northeast Asphalt	12.20	0.61	1.51			2		1.75"	1,7
5	Buffalo	7127-02-60	STH 37	CTH J – STH 88	Mathy Construction	10.82	0.26	1.23			3		2.50"	7
5	Vernon	5101-03-60	STH 33	Ontario – Hillsboro	Mathy Construction	6.52	0.21	1.28			3		2.50"	1
5	Crawford	5790-02-60	STH 171	Mt. Sterling – Gays Mills	Mathy Construction	10.04	0.27	1.28			3		2.50"	1
5	LaCrosse	7930-07-61	STH 108	STH 16 – Mindoro	Mathy Construction	9.78	0.26	1.32			3		2.50"	1
5	LaCrosse	5120-04-63	STH 33	LaCrosse – East County Line	Mathy Construction	5.16	0.31	1.14			3		2.50"	1
5	LaCrosse	5823-02-61	STH 162	STH 33 – IH 90	Mathy Construction	8.44	0.35	1.30			3		2.50"	1
5	LaCrosse	5121-02-60	STH 33	LaCrosse – East County Line	Mathy Construction	6.25	0.02	0.95			3		3.00"	1
5	LaCrosse	5823-02-63	STH 162	South County Line – STH 33	Mathy Construction	9.79	0.33	1.02			3		3.00"	3
5	Monroe	7712-01-60	STH 71	West County Line – STH 27	Mathy Construction	12.67	0.28	1.13			3		3.00"	3
5	Jackson	7712-01-61	STH 71	STH 108 – East County Line	Mathy Construction	2.68	0.12	1.03			3		3.00"	3
5	Vernon	5867-01-61	STH 162	Chaseburg – USH 14	Mathy Construction	8.48	0.26	1.10			3		3.00"	1
5	Vernon	5820-03-60	STH 162	USH 14 – North County Line	Mathy Construction	3.77	0.03	1.22			3		3.00"	3
5	Vernon	1646-06-63	USH 14	Central Ave – Village of Coon Valley	Mathy Construction	1.72	0.01	1.40			2		1.50"	7
5	Jackson	7505-03-60	STH 121	Northfield – STH 95	Mathy Construction	14.07	0.23	2.10	X		3		3.00"	1

WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PORTLAND CEMENT CONCRETE PAVEMENT
ROAD PROFILER MEASUREMENTS
NEW CONSTRUCTION – 1996

District	County	Project	Highway Number	Name of Road	Paving Contractor	Length Lane-Miles	IRI Std Dev	IRI Proj.	Joint Spacing	Plan Thickness	Doweled B – Basket I – Inserted	Base OGBC DGBC
1	Dane	5411-01-81	USH 51	East Madison Beltline	James Cape and Sons	3.84	0.02	1.92	Random	10.00"	B	OGBC
1	Dane	5411-01-88	STH 30	Madison – Milwaukee Rd	James Cape and Sons	5.09	0.07	1.95	Random	10.00"	B	OGBC
1	Jefferson	1391-03-71	STH 26	Jefferson – Watertown Rd	Trierweiler	12.15	0.30	1.29	Random	9.00"	B	OGBC
1	Jefferson	1391-04-71	STH 26	Jefferson – Watertown Rd	Trierweiler	11.87	0.29	1.06	Random	9.00"	B	OGBC
1	Dodge	1111-08-77	USH 151	Beaver Dam – Waupun Rd	Zignego	16.09	0.29	1.78	20'	10.00"	B	OGBC
4	Juneau	1017-00-75	IH – 90	Tomah – Lake Delton	James Cape and Sons	24.47	0.18	1.28	Random	12.00"	I	OGBC
4	Wood	1526-03-78	STH 54	48th St – CTH U	Zignego	6.45	0.10	1.45	20'	9.00"	B	DGBC
4	Wood	6932-02-71	STH 54	54 – CTH U	Trierweiler	4.24	0.00	1.84	20'	9.00"	B	DGBC
4	Waupaca	1510-08-71	USH 10	Anderson Rd – CTH E	Trierweiler	12.65	0.18	1.69	Random	10.00"	B	DGBC
5	Jackson	1021-09-78	IH-94	Milston – Kirby	Streu Const. Co.	18.19	0.43	1.32	Random	12.00"	I	OGBC
6	Eau Claire	1020-06-72	IH – 94	USH 53 Interchange	Trierweiler	5.01	0.03	1.62	Random	12.00"	B	DGBC
7	Lincoln	1176-01-71	USH 51	Merrill – CTH H	Vinton	29.49	0.43	1.41	Random	10.00"	I	OGBC
7	Lincoln	1176-01-76	USH 51	CTH H – Pine Creek	Streu Const. Co.	16.85	0.54	1.36	Random	10.00"	I	OGBC

PROFILER ROAD MEASUREMENTS

CONSTRUCTION DATA

5 YEAR AVERAGE BY DISTRICT

Portland Cement Concrete Pavements

IRI

District	1992 Lane Miles Tested	1992 Avg IRI	1993 Lane Miles Tested	1993 Avg IRI	1994 Lane Miles Tested	1994 Avg IRI	1995 Lane Miles Tested	1995 Avg IRI	1996 Lane Miles Tested	1996 Avg IRI	Total Lane Miles Tested	Total Avg IRI
1	87.06	1.54	30.16	1.51	30.94	1.40	2.76	2.56	49.04	1.51	199.96	1.52
2	4.00	1.74	5.52	1.93	19.63	1.58	9.12	1.62			38.27	1.66
3	40.20	1.54	90.52	1.44	33.91	1.55	11.60	1.31			176.23	1.48
4	52.29	1.54	2.55	1.41	63.00	1.47	21.82	1.20	47.80	1.46	187.46	1.45
5					17.13	1.13			18.19	1.32	35.32	1.23
6			20.34	1.43	80.17	1.40			5.01	1.62	105.52	1.42
7	14.52	1.48			2.06	1.58			46.35	1.39	62.93	1.42
8							19.06	1.59			19.06	1.59
TOTAL	198.07	1.54	149.09	1.47	246.84	1.44	64.36	1.45	166.39	1.45	824.75	1.47

Hot Mix Ashpaltic Concrete Pavements

IRI

District	1992 Lane Miles Tested	1992 Avg IRI	1993 Lane Miles Tested	1993 Avg IRI	1994 Lane Miles Tested	1994 Avg IRI	1995 Lane Miles Tested	1995 Avg IRI	1996 Lane Miles Tested	1996 Avg IRI	Total Lane Miles Tested	Total Avg IRI
1	206.29	1.66	94.46	1.54	163.57	0.98	98.05	0.97	62.11	1.04	624.48	1.29
2	162.41	1.62	170.09	1.53	209.30	1.12	36.62	0.94	97.57	1.01	675.99	1.32
3	179.92	1.54	86.59	1.43	139.30	0.81	47.84	1.02	118.16	1.03	571.81	1.20
4	186.49	1.58	103.45	1.49	128.55	0.82	89.09	1.04	44.03	1.00	551.61	1.25
5	51.99	1.58	137.40	1.44	129.59	1.16	85.10	1.02	220.69	1.12	624.77	1.22
6	73.67	1.74	111.40	1.54	100.52	0.94	61.39	1.17	187.28	1.01	534.26	1.23
7	113.08	1.62	121.86	1.54	132.15	0.85	74.69	0.97	26.92	0.95	468.70	1.24
8	50.14	1.78	198.72	1.48	142.49	0.90	44.13	1.18	62.13	1.02	497.61	1.26
TOTAL	1023.99	1.62	1023.97	1.50	1145.47	0.96	536.91	1.03	818.88	1.04	4549.22	1.25

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

CONSTRUCTION DATA

5 YEAR AVERAGE BY CONTRACTOR

Portland Cement Concrete Pavements – IRI

Contractor	1992		1993		1994		1995		1996		5 Year Avg	
	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI
James Cape & Sons	62.66	1.44	42.35	1.45	56.34	1.44	33.42	1.24	33.40	1.46	228.17	1.42
Milwaukee General	4.00	1.74									4.00	1.74
Mashuda Contractors Inc.							9.12	1.62			9.12	1.62
Streu Const Co.	34.02	1.62	38.76	1.49	78.56	1.43	10.55	1.56	35.04	1.34	196.93	1.47
Trierweiler	45.01	1.54	9.39	1.41	48.77	1.32	11.27	1.85	45.92	1.43	160.36	1.46
Vinton	29.46	1.58	54.18	1.44	24.74	1.54			29.49	1.41	137.87	1.48
Zignego	22.92	1.44	4.41	1.98	38.43	1.51			22.54	1.69	88.30	1.56
TOTAL	198.07	1.52	149.09	1.47	246.84	1.43	64.36	1.45	166.39	1.45	824.75	1.47

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

CONSTRUCTION DATA

5 YEAR AVERAGE BY CONTRACTOR

Hot Mix Asphaltic Concrete Pavement -- IRI

Contractor	1992		1993		1994		1995		1996		5 Year Avg	
	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI	Lane Miles Tested	Avg IRI
American Asphalt	24.81	1.35	30.87	1.05	72.10	1.00	28.05	1.31	9.70	1.00	165.53	1.11
Bacco					19.41	1.04					19.41	1.04
Barron County							7.88	1.34			7.88	1.34
B.R. Amon & Sons	63.19	1.17	46.91	0.99	105.01	0.98	37.27	1.05	124.76	1.05	377.14	1.04
Clark County			5.98	1.02			10.47	1.19	11.93	1.22	28.38	1.17
Fox Valley Const	16.55	1.12	5.06	0.95							21.61	1.08
D.L. Gasser			11.24	1.07	4.89	1.65	18.64	0.87	1.11	1.87	35.88	1.07
Lakeside Pavers	21.20	1.21									21.20	1.21
Langlade County	1.69	1.12			1.69	1.10					3.38	1.11
Lincoln County	7.04	1.25									7.04	1.25
Mathy Construction	322.77	1.17	427.09	1.00	450.96	0.96	233.62	1.09	442.14	1.05	1876.58	1.04
Milwaukee General			1.33	2.35							1.33	2.35
Monarch Paving	16.85	1.51	54.22	1.03	47.23	0.92	22.87	0.99	7.73	1.13	148.96	1.05
Munson Bros. Inc.			1.29	2.10							1.29	2.10
Murphy Construction Co	4.94	1.25	7.60	1.13					34.09	0.93	46.63	1.00
Northeast Asphalt	274.68	1.08	218.86	1.03	217.64	0.78	128.52	0.89	97.61	1.06	937.31	0.97
Payne & Dolan	195.08	1.25	92.85	1.03	212.94	1.09	39.19	0.94	59.35	0.93	599.41	1.11
Pitlick & Wick Inc.	3.49	1.17	13.70	0.94	4.31	0.84					21.50	0.96
Ptaschinski Const.,Inc.							1.47	1.75			1.47	1.75
Rodrigues			4.67	1.49							4.67	1.49
Rock Road of Wisc	38.50	1.17	46.53	1.03	9.29	1.00	8.95	0.96	30.47	1.04	133.74	1.07
Tower Asphalt			10.12	1.55							10.12	1.55
Valley Paving	21.00	1.08									21.00	1.08
Washburn County	2.00	1.35									2.00	1.35
Waupaca County	10.20	1.21									10.20	1.21
WM. Beaudoin & Son			42.83	1.05							42.83	1.05
No Contractor			2.76	1.07							2.76	1.07
TOTAL	1023.99	1.17	1023.97	1.03	1145.47	0.96	536.93	1.03	818.88	1.04	4549.24	1.05

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

CONSTRUCTION DATA

5 YEAR AVERAGE BY SURFACE TYPE

IRI

Pavement Type	1992 Lane Miles Tested	1992 Avg IRI	1993 Lane Miles Tested	1993 Avg IRI	1994 Lane Miles Tested	1994 Avg IRI	1995 Lane Miles Tested	1995 Avg IRI	1996 Lane Miles Tested	1996 Avg IRI	Total Lane Miles Tested	Total Avg IRI
PCC PAVEMENTS												
Slipform – Jointed	198.07	1.54	134.91	1.48	246.85	1.43	64.36	1.45	166.39	1.45	810.58	1.47

IRI

Pavement Type	1992 Lane Miles Tested	1992 Avg IRI	1993 Lane Miles Tested	1993 Avg IRI	1994 Lane Miles Tested	1994 Avg IRI	1995 Lane Miles Tested	1995 Avg IRI	1996 Lane Miles Tested	1996 Avg IRI	Total Lane Miles Tested	Total Avg IRI
Standard Plant Mix –												
Asphaltic Concrete	261.41	1.21									261.41	1.21
Single Aggregate	206.70	1.26									206.70	1.26
Recycled	239.53	1.16	57.47	1.04	48.34	0.98	8.57	1.05			353.91	1.11
Rut Resistant	316.35	1.12									316.35	1.12
Stone Matrix –												
Asphaltic Concrete			96.41	1.08	74.40	1.37	43.18	0.87	87.75	1.09	301.74	1.12
High Volume			191.73	1.00	233.96	0.88	83.24	0.92	243.40	0.99	752.33	0.95
Medium Volume			498.69	1.04	623.49	0.92	319.60	1.03	348.06	0.99	1789.84	0.99
Low Volume			115.88	1.04	165.28	1.03	82.33	1.22	126.28	1.30	489.77	1.13
Special Mix			63.79	1.12					13.40	0.87	77.19	1.08
Total	1023.99	1.18	1023.97	1.04	1145.47	0.96	536.92	1.03	818.88	1.04	4549.23	1.11

* IRI is reported in k/km

PROFILER ROAD MEASUREMENTS

CONSTRUCTION PROJECT DATA

AVERAGE BY CONSTRUCTION TECHNIQUE

Portland Cement Concrete Pavements

Type of Technique	1992 Lane Miles Tested	1992 Avg IRI	1993 Lane Miles Tested	1993 Avg IRI	1994 Lane Miles Tested	1994 Avg IRI	1995 Lane Miles Tested	1995 Avg IRI	1996 Lane Miles Tested	1996 Avg IRI	Total Lane Miles Tested	Total Avg IRI
Jointed:												
8.0"	19.50	1.78									19.50	1.78
9.0"	35.93	1.51	56.78	1.48	72.44	1.46	21.82	1.71	34.71	1.31	221.68	1.47
10.0"	12.74	1.62	92.31	1.48	33.29	1.40			84.02	1.57	222.36	1.51
11.0"	40.62	1.54			109.34	1.37	9.12	1.62	47.67	1.33	206.75	1.41
12".0	89.28	1.41			31.77	1.66	33.42	1.24			154.47	1.42
Joint Repair & Patching												
Doweling:												
Basket	126.14	1.54	50.77	1.44	109.59	1.44	11.27	1.85	77.39	1.56	375.16	1.51
Inserted	71.93	1.41	98.32	1.48	137.25	1.43	53.09	1.37	89.00	1.35	449.59	1.41
Doweled												
8.0"	19.50	1.78									19.50	1.78
9.0"	35.93	1.51	56.78	1.44	72.44	1.46	21.82	1.71	34.71	1.31	221.68	1.46
10.0"	12.74	1.62	92.31	1.48	33.29	1.40			84.02	1.57	222.36	1.51
11.0"	40.62	1.54			109.34	1.37	9.12	1.62			206.75	1.41
12.0"	89.28	1.41			31.77	1.66	33.42	1.24	47.67	1.33	202.14	1.40
Base:												
OGBC			126.20	1.48	154.44	1.49	23.48	1.58	138.05	1.41	442.17	1.47
DGBC			22.89	1.41	92.40	1.35	40.88	1.38	28.35	1.64	184.52	1.41
CABC												
Other												
Patch &Grind												
Joint Repair & Patching												
Joint Spacing:												
Random	198.07	1.51	120.68	1.44	239.40	1.42	52.48	1.36	139.61	1.40	750.24	1.44
20			28.41	1.51	7.44	1.97	11.88	1.84	26.78	1.71	74.51	1.68
Total Jointed	198.07	1.50	149.09	1.48	246.84	1.44	64.36	1.45	166.39	1.45	824.75	1.46
Total Doweled	198.07	1.50	149.09	1.48	246.84	1.44	64.36	1.45	166.39	1.45	824.75	1.46

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

CONSTRUCTION PROJECT DATA

AVERAGE BY CONSTRUCTION TECHNIQUE

Hot Mix Asphaltic Concrete Pavements

Type of Technique	1992 Lane Miles Tested	1992 Avg IRI	1993 Lane Miles Tested	1993 Avg IRI	1994 Lane Miles Tested	1994 Avg IRI	1995 Lane Miles Tested	1995 Avg IRI	1996 Lane Miles Tested	1996 Avg IRI	Total Lane Miles Tested	Total Avg IRI
Depth:												
7.00"					19.14	0.80			43.59	0.93	62.73	0.89
6.00"	4.35	0.96	22.30	1.26	7.96	1.00	4.62	0.89	75.61	1.03	114.84	1.06
5.50"	51.71	1.30	37.65	1.21	76.67	1.01	10.03	1.15	15.79	1.17	191.85	1.15
5.00"	145.21	1.21	159.58	1.00	129.40	0.91	140.97	0.87	106.56	0.92	681.72	0.99
4.50"	151.64	1.16	196.53	0.96	74.37	0.84	12.33	0.82	51.28	0.99	486.15	1.00
4.00"	218.84	1.08	54.60	1.08	81.23	0.88	36.49	1.27	30.47	1.04	421.63	1.05
3.75"					27.08	1.04	15.92	0.87	12.17	0.99	55.17	0.98
3.50"	108.55	1.12	112.11	0.96	106.77	0.86	32.32	1.17	71.55	1.03	431.30	1.00
3.25"							18.56	0.92			18.56	0.92
3.00"	240.22	1.21	277.29	1.12	283.72	0.93	143.06	1.01	216.91	1.06	1161.20	1.07
2.75"					8.43	0.97			5.91	1.44	14.34	1.16
2.50"	31.41	1.12	17.53	1.12	46.68	1.01	28.65	1.17	62.69	1.26	186.96	1.15
2.25"					14.47	1.09			14.42	0.91	28.89	1.00
2.00"	42.92	1.16	89.80	1.16	187.38	1.20	54.36	1.13			374.46	1.18
1.75"					41.77	0.72			12.20	1.51	53.97	0.90
1.50"	28.40	1.36	56.58	1.12	28.57	0.89	39.61	1.27	99.72	1.04	252.88	1.11
0.75"					11.83	0.92					11.83	0.92
Paved Over:												
OGBC	46.27	1.26	6.35	1.40	17.48	0.93			51.01	0.94	121.11	1.09
DGBC			115.11	1.00	92.74	0.96	44.13	1.18			251.98	1.02
Rubbleized	28.49	1.12			41.67	0.71			47.52	1.04	117.68	0.94
Crack & Seat	6.00	1.57									6.00	1.57
New Base	324.34	1.21	245.98	1.16	212.12	0.88	99.00	0.96	67.11	1.14	948.55	1.09
Old AC	47.48	1.16	211.28	1.00	292.32	0.95	142.94	1.14	103.82	1.05	797.84	1.02
Old PCC	161.47	1.16	259.78	1.12	130.72	1.16	99.83	0.88	183.82	1.05	835.62	1.09
Milled	455.47	1.08	324.46	1.04	354.94	0.97	151.01	1.03	365.60	1.05	1651.48	1.04
Other					3.48	1.01					3.48	1.01
Total	1023.25	1.17	1023.97	1.06	1145.47	0.96	536.92	1.03	818.88	1.04	4548.49	1.05

* IRI is reported in m/km