MEMO/CORRESPONDENCE WISCONSIN DEPARTMENT OF TRANSPORTATION

DATE: February 26, 1996

TO: District Directors
Transportation District #____
Attn: District, Chief Construction Engineer
District, Chief Materials Engineer

FROM: Stephen F. Shober, P.E. Bill Duckett for Steve Shober
Chief Pavement Performance and Research Engineer

SUBJECT: 1995 New Construction Ride Quality Measurements

For your information, we are providing you with several copies of the 1995 New Construction Ride Quality Measurements report. The data in this report is in units of International Roughness Index (IRI)...m/km. IRI values close to zero indicate an excellent ride while values above 4.5 indicate a very poor ride.

The testing procedure has remained the same as in the previous years. The 1995 new construction ride quality measurements were conducted on projects completed before December 15, 1995. We tested 53 project (7 PCC and 46 AC) whose combined lane miles were 601 miles. The number of lane miles tested in 1995 is lower than in 1994 due to equipment malfunction. Because of this malfunction only 63 miles of PCC and 537 miles of AC were tested in 1995.

This year's new construction data shows that PCC pavements averaged 1.45 IRI and AC pavement averaged 1.03. The result does not indicate a significant change in ride quality between 1994 and 1995 data.

A five-year analysis of the data indicates no appreciable difference in ride, Figure 1. The low point in Figure 1 may be somewhat due to the transition from the first generation of Profiler to the second.

The roughness data for new construction projects is summarized in the attachment. The data shows lane miles, mean IRI, and the standard deviation for each project. Figure 1 is a summary of the five-year trend and table 1 will help you convert IRI to the Present Serviceability Index (PSI).

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

Attachments

cc: Dan Pritchard
Jim Gruendler

PROFILER ROAD MEASUREMENTS

1995 CONSTRUCTION PROJECTS

FIVE YEAR AVERAGES

Portland Cement Concrete Pavements

CONSTRUCTION Year	Average IRI
1991	1.51
1992	1.50
1993	1.22
1994	1.43
1995	1.45
5–Year Average	1.42

Hot Mix Asphaltic Concrete Pavements

CONSTRUCTION Year	Average IRI
1991	1.25
1992	1.20
1993	0.88
1994	0.96
1995	1.03
5–Year Average	1.06

* IRI is reported in m/km

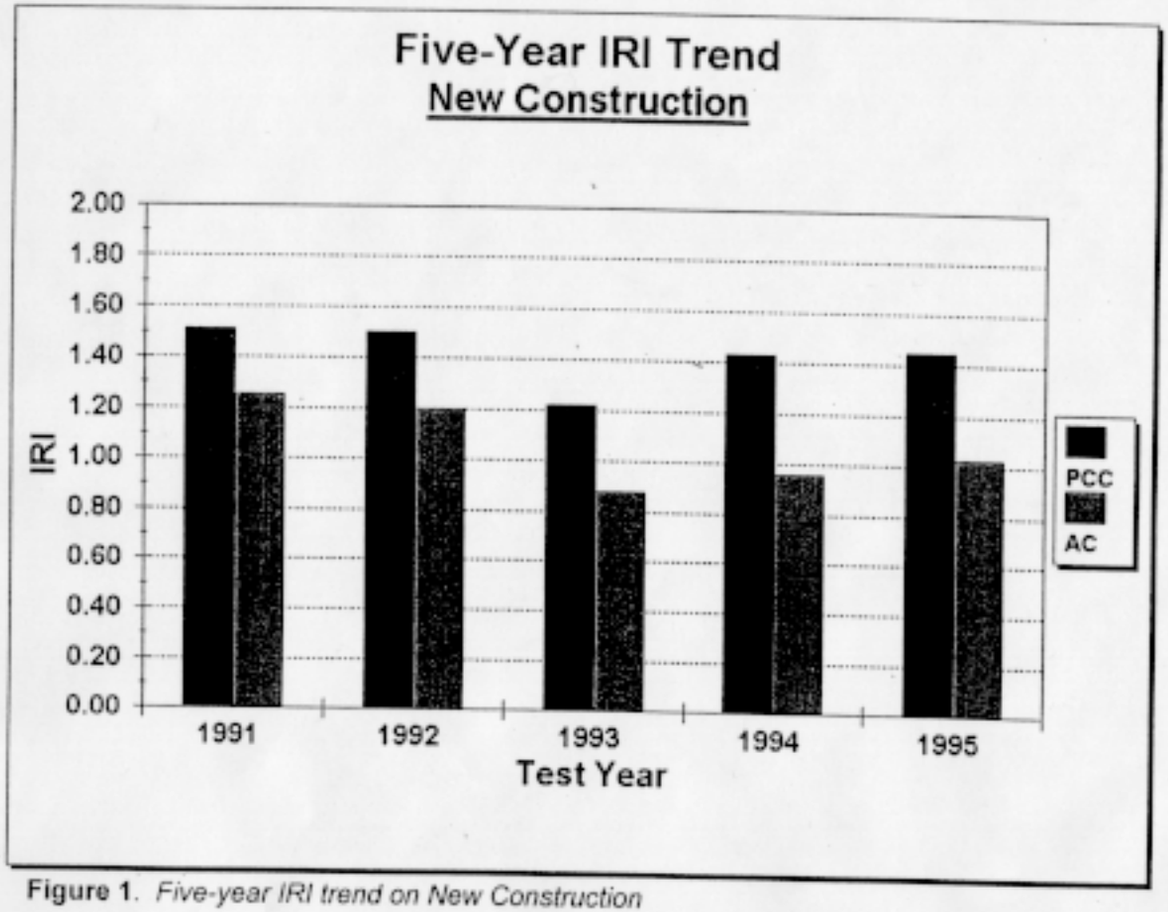

Figure 1. *Five-year IRI trend on New Construction*

CURRENT PSI	EQUIVALENT RANGE IRI(M/KM)
4.5 - 5.0	1.25 - 0.00
4.0 - 4.5	1.50 - 1.25
3.5 - 4.0	2.00 - 1.50
3.0 - 3.5	2.50 - 2.00
2.5 - 3.0	3.00 - 2.50
2.0 - 2.5	3.50 - 3.00
1.5 - 2.0	4.00 - 3.50
1.0 - 1.5	4.50 - 4.00
0.0 - 1.0	12.0 - 4.50

Table 1. *IRI to PSI conversion*

PROFILER ROAD MEASUREMENTS

1995 CONSTRUCTION PROJECTS

AVERAGE BY DISTRICT

Portland Cement Concrete Pavements

District	Lane Miles	No. of Projects	Average IRI
1	2.76	1	2.56
2	9.12	1	1.62
3	11.60	2	1.31
4	21.82	1	1.20
8	19.06	2	1.59
TOTAL	64.36	7.00	1.45

Hot Mix Asphaltic Concrete Pavements

District	Lane Miles	No. of Projects	Average IRI
1	98.05	12	0.97
2	36.62	4	0.94
3	47.84	6	1.02
4	89.09	4	1.04
5	85.10	9	1.02
6	61.39	4	1.17
7	74.69	4	0.97
8	44.13	4	1.18
TOTAL	492.78	43	1.02

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

1995 CONSTRUCTION PROJECTS

AVERAGE BY CONTRACTOR

Portland Cement Concrete Pavement

Contractor	Lane Miles	No. of Projects	Average IRI
Trierweiler Const.	11.27	2	1.85
Streu Const Co.	10.55	1	1.56
James Cape & Sons	33.42	3	1.24
Mashuda Contractors Inc.	9.12	1	1.62
TOTAL	64.36	7	1.45

Hot Mix Asphaltic Concrete Pavement

Contractor	Lane Miles	No. of Projects	Average IRI
Northeast Asphalt	128.52	12	0.89
Monarch	22.87	1	0.99
Mathy Construction	233.62	17	1.09
B.R. Amon & Sons	37.27	3	1.05
American Asphalt	28.05	1	1.31
Rock Road of Wisc	8.95	2	0.96
Payne & Dolan	39.19	4	0.94
Ptaschinski Const.,Inc.	1.47	1	1.75
Clark County	10.47	2	1.19
Barron County	7.88	1	1.34
D.L Gasser	18.64	2	0.87
TOTAL	536.91	46	0.98

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

1995 CONSTRUCTION PROJECTS

AVERAGE BY SURFACE TYPE

Portland Cement Concrete Pavements

Type	Lane Miles	No. of Projects	Average IRI
PCC Pavements	64.36	7	1.45

(All PCC New Construction Projects used Slip–Form)

Hot Mix Asphaltic Concrete Pavements

Type	Lane Miles	No. of Projects	Average IRI
Recycled	8.57	1	1.05
SMA	43.18	3	0.87
High Volume	83.24	11	0.92
Medium Volume	319.60	27	1.03
Low Volume	82.33	9	1.22
	536.91	51	1.03

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

1995 CONSTRUCTION PROJECTS

AVERAGE BY CONSTRUCTION TECHNIQUE

Portland Cement Concrete Pavements

Type of Technique		No. of Proj.	Mileage	AVG IRI
Doweling:				
	Basket	2	11.27	1.85
	Inserter	5	53.09	1.37
Surface Depth:				
Doweled				
	9.0"	3	21.82	1.71
	11.0"	1	9.12	1.62
	12".0	3	33.42	1.24
Base:				
	OGBC	4	23.48	1.58
	DGBC	3	40.88	1.38
	Grind			
	Joint Repair & Patching			
Joint Spacing:				
	Random	5	52.48	1.36
	20	2	11.88	1.84

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

1995 CONSTRUCTION PROJECTS

AVERAGE BY CONSTRUCTION TECHNIQUE

Hot Mix Asphaltic Concrete Pavements

Type of Technique	No. of Proj.	Mileage	AVG IRI
Depth:			
6.00"	1	4.62	0.89
5.50"	2	10.03	1.15
5.00"	14	140.97	0.87
4.50"	2	12.33	0.82
4.00"	5	36.49	1.27
3.75"	1	15.92	0.87
3.50"	3	32.32	1.17
3.25"	1	18.56	0.92
3.00"	10	143.06	1.01
2.50"	2	28.65	1.17
2.00"	4	54.36	1.13
1.50"	2	39.61	1.27
Paved Over:			
New Base	15	99.00	0.96
Old AC	7	142.94	1.14
DGBC	4	44.13	1.18
Milled	14	151.01	1.03
Old PCC	7	99.83	0.88

* IRI is reported in m/km

WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

HOT MIX ASPHALTIC CONCRETE PAVEMENT
ROAD PROFILER MEASUREMENTS
NEW CONSTRUCTION – 1995

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-Rubbleize 5-Open Grade 6-Dense Grade 7-Old AC 8-Crack & Seat
1	Jefferson	1067-01-72	IH - 94	Madison - Waukesha	Payne & Dolan	18.56	0.37	0.92			1		3.20"	2
1	Dane	3070-00-60	STH 73	IH-90 - Deerfield	Payne & Dolan	6.69	0.34	1.02			2		4.00"	1
1	Dane	3671-00-60	STH 134	Cambridge - CTH O	Payne & Dolan	5.79	0.24	0.86			2		3.00"	1
1	Lafayette	5309-04-71	CTH W	CTH A - CTH P	Rock Road of Wisc	6.80	0.08	0.91			3		3.00"	3
1	Lafayette	5242-00-72	CTH KK	ILL. State Line - CTH DD	Rock Road of Wisc	2.15	0.01	1.12			3		4.00"	3
1	Sauk	5090-03-71	STH 33	Baraboo - IH-90	D.L. Gasser	8.57	0.55	1.05	X		2		5.50"	3
1	Columbia	6040-03-71	STH 33	CTH SS - STH 146	B.R. Amon & Sons	11.24	0.17	0.88			2		5.00"	3
1	Columbia	6040-02-72	STH 33	STH 22 - CTH SS	Northeast Asphalt	8.04	0.02	0.78			2		5.00"	3
1	Sauk/Columbia	5090-02-72	STH 33	Baraboo River - IH-90	D.L. Gasser	10.07	0.26	0.71			2		4.50"	1
1	Dane	3060-00-71	STH 73	IH-94 - Marshall	Payne & Dolan	8.15	0.14	0.98			2		5.00"	3
1	Columbia	6010-00-72	STH 60	Maple Ave - STH 16	Northeast Asphalt	2.26	0.00	1.30			1		4.50"	3
1	Dodge	3021-03-71	STH 28	Mayville - Theresa	Northeast Asphalt	9.73	0.74	1.43			2		3.50"	1
2	Dodge	1107-03-79	USH 41	STH 28 - Super Rd	Northeast Asphalt	10.31	0.34	0.71		X	1		3.00"	2
2	Dodge	1107-03-81	USH 41	STH 28 - Super Rd	Northeast Asphalt	10.01	0.31	0.73		X	1		3.00"	2
2	Washington	2012-08-70	STH 175	STH 60 - Maple St	Ptaschinski Const., Inc.	1.47	0.13	1.75			1		5.50"	3
2	Fond Du Lac	4090-01-70	STH 67	USH 41 - Cambellsport	Northeast Asphalt	14.85	0.41	1.17			2		3.00"	7
3	Manitowoc	1224-05-71	IH-43	Fisher Creek Rd. - CTH F	Northeast Asphalt	4.62	0.36	0.89			1		6.00"	2

WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

HOT MIX ASPHALTIC CONCRETE PAVEMENT
ROAD PROFILER MEASUREMENTS
NEW CONSTRUCTION – 1995

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		
3	Oconto	9180–06–71	STH 22	Gillett – Oconto Falls	B.R. Amon & Sons	12.89	0.45	0.97			2		3.00"	1
3	Oconto	9180–07–71	STH 22	Gillett – Oconto Falls	B.R. Amon & Sons	2.63	0.01	1.04			2		3.00"	1
3	Oconto	9190–08–71	STH 32	South County Line – CTH E	Northeast Asphalt	15.92	0.27	0.87			2		3.75"	1
3	Marinette	9160–05–71	STH 64	USH 141 – CTH E	B.R. Amon & Sons	10.52	0.45	1.33			3		4.00"	3
3	Menominee	9650–08–71	STH 47	South County Line – Duquaine Rd	Northeast Asphalt	1.27	0.00	1.20			2		4.00"	1
4	Wood/Juneau	1628–00–72	STH 80	Necedah – Babcock	Mathy Construction	38.82	0.42	0.93			2		3.00"	7
4	Wood/Juneau	7020–11–63	STH 173	Mather – Babcock	Mathy Construction	28.40	0.36	1.19			2		2.00"	7
4	Marathon	6380–04–71	STH 97	Stratford – STH 29	Mathy Construction	7.17	0.16	1.24			2		5.00"	3
4	Green Lake	6210–07–71	STH 49	Green Lake – Berlin	Northeast Asphalt	14.72	0.40	0.91			2		3.50"	1
5	Vernon	1647–03–75	USH 14	Westby – Viroqua	Mathy Construction	12.93	0.43	1.06			1		3.00"	2
5	Vernon	5150–06–60	STH 82	Desota – Viroqua	Mathy Construction	18.96	0.45	1.21			3		2.50"	7
5	Crawford	5781–02–60	STH 131	Stuben – Gays Mills	Mathy Construction	9.69	0.30	1.07			3		2.50"	7
5	Trempealeau	1023–02–71	IH–94	North County Line – East County Line	Mathy Construction	15.50	0.51	0.96			1		2.00"	7
5	Trempealeau	1535–07–71	USH 10	USH 53 – East County Line	Mathy Construction	11.65	0.42	0.91			1		5.00"	1
5	Trempealeau	7132–01–71	STH 93	Tamarack Rd – Schultz Rd	Mathy Construction	3.83	0.50	0.88			2		5.00"	3
5	Trempealeau	7132–01–72	STH 93	Schultz Rd – Blashico Ave	Mathy Construction	6.50	0.32	0.82			2		5.00"	3
5	Trempealeau	7132–01–73	STH 93	Blashico Ave – STH 95	Mathy Construction	4.95	0.48	0.96			2		5.00"	3
5	Trempealeau	7132–03–71	STH 93	Arcadia – Independence	Mathy Construction	1.11	0.06	0.97			2		5.00"	3

WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

HOT MIX ASPHALTIC CONCRETE PAVEMENT
ROAD PROFILER MEASUREMENTS
NEW CONSTRUCTION – 1995

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		
6	Taylor	9002-02-71	STH 64	Medford – East County Line	American Asphalt	28.05	0.16	1.31			2		3.00"	1
6	Chippewa	1191-03-71	USH 53	Chippewa Falls – Bloomer-	Monarch	22.87	0.25	0.99		X	1		1.50"	2
6	Clark	7835-06-71	CTH O	Globe – STH 29	Clark County	4.07	0.56	0.98			3		2.00"	1
6	Clark	8882-05-70	CTH X	Withee – Owen	Clark County	6.41	0.07	1.33			3		2.00"	1
7	Price	1614-11-70	STH 13	South County Line – CTH A	Mathy Construction	21.15	0.26	0.89			2		5.00"	1
7	Lincoln	9031-08-70	STH 17	STH 64 – Big Hay Meadow Creek	Mathy Construction	16.74	0.32	1.64			2		1.50"	7
7	Langlade	1602-04-71	USH 45	CTH B – CTH J	Northeast Asphalt	16.26	0.25	0.66			1		5.00"	3
7	Langlade	1602-04-70	USH 45	CTH J – North County Line	Northeast Asphalt	20.54	0.34	0.75			2		5.00"	2
8	Barron	8816-04-72	CTH B	Silver Lake – CTH V	Barron County	7.88	0.05	1.34			3		3.50"	6
8	Burnett	8040-03-73	STH 70	West County Line – Siren	Mathy Construction	10.40	0.28	0.92			2		5.00"	6
8	Polk	8868-02-71	CTH M	Osceola – Nye	Mathy Construction	9.98	0.57	1.04			2		5.00"	6
8	Sawyer	8570-06-71	STH 48	CTH C – STH 40	Mathy Construction	15.87	0.22	1.37			3		4.00"	6

WISCONSIN DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PORTLAND CEMENT CONCRETE PAVEMENT
ROAD PROFILER MEASUREMENTS
NEW CONSTRUCTION – 1995

District	County	Project	Highway Number	Name of Road	Paving Contractor	Length Lane–Miles	IRI		Joint Spacing	Plan Thickness	Doweled B – Basket I – Inserted	Base OGBC DGBC
							Std Dev	Proj.				
1	Iowa	5255–04–71	STH 23	Iowa & Bequette St. City of Dodgeville	Trierweiler Const.	2.76	0.08	2.56	20'	9.00"	B	OGBC
2	Dodge	1107–03–70	USH 41	STH 49 Interchange	Mashuda Contractors Inc.	9.12	0.31	1.62	20'	11.00"	I	OGBC
3	Winnebago	1120–17–71	USH 41	Lake Butte Des Mortes – Neenah	James Cape and Sons	9.86	0.56	1.27	Random	12.00"	I	OGBC
3	Winnebago	1120–25–71	USH 41	USH 45 Interchange	James Cape and Sons	1.74	0.01	1.50	Random	12.00"	I	OGBC
4	Juneau	1017–00–79	IH–90	Tomah – Lake Delton	James Cape and Sons	21.82	0.35	1.20	Random	12.00"	I	DGBC
8	Polk	1572–09–71	USH 8	West County Line – CTH Y	Trierweiler Const.	8.51	0.26	1.62	Random	9.00"	B	DGBC
8	Washburn	1198–01–78	USH 53	Trego – Lampson	Streu Const. Co.	10.55	0.32	1.56	Random	9.00"	I	DGBC

PROFILER ROAD MEASUREMENTS

CONSTRUCTION DATA

5 YEAR AVERAGE BY DISTRICT

Portland Cement Concrete Pavements

IRI

District	1991 Lane Miles Tested	1991 Avg IRI	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	Total Lane Miles Tested	Total Avg IRI
1	86.39	1.51	87.06	1.54	30.16	1.51	30.94	1.40	2.76	2.56	237.31	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	9.22	1.78	52.29	1.54	2.55	1.41	63.00	1.47	21.82	1.20	148.88	1.47
5							17.13	1.13			17.13	1.13
6					20.34	1.43	80.17	1.40			100.51	1.41
7	11.70	1.41	14.52	1.48			2.06	1.58			28.28	1.46
8									19.06	1.59	19.06	1.59
TOTAL	107.31	1.52	198.07	1.54	149.09	1.47	246.84	1.44	64.36	1.45	765.67	1.48

Hot Mix Ashpaltic Concrete Pavements

IRI

District	1991 Lane Miles Tested	1991 Avg IRI	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	Total Lane Miles Tested	Total Avg IRI
1	48.61	1.78	206.29	1.66	94.46	1.54	163.57	0.98	98.05	0.97	610.98	1.36
2	51.78	1.70	162.41	1.62	170.09	1.53	209.30	1.12	36.62	0.94	630.20	1.40
3			179.92	1.54	86.59	1.43	139.30	0.81	47.84	1.02	453.65	1.24
4	20.90	1.58	186.49	1.58	103.45	1.49	128.55	0.82	89.09	1.04	528.48	1.29
5			51.99	1.58	137.40	1.44	129.59	1.16	85.10	1.02	404.08	1.28
6			73.67	1.74	111.40	1.54	100.52	0.94	61.39	1.17	346.98	1.34
7	75.58	1.62	113.08	1.62	121.86	1.54	132.15	0.85	74.69	0.97	517.36	1.31
8	137.08	1.66	50.14	1.78	198.72	1.48	142.49	0.90	44.13	1.18	572.56	1.38
TOTAL	333.95	1.67	1023.99	1.62	1023.97	1.50	1145.47	0.96	536.91	1.03	4064.29	1.33

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

CONSTRUCTION DATA

5 YEAR AVERAGE BY CONTRACTOR

Portland Cement Concrete Pavements – IRI

Contractor	1991		1992		1993		1994		1995		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	28.42	1.48	62.66	1.44	42.35	1.45	56.34	1.44	33.42	1.24	223.19	1.42
Milwaukee General			4.00	1.74							4.00	1.74
Mashuda Contractors Inc.									9.12	1.62	9.12	1.62
Peterson & Sons	9.22	1.78									9.22	1.78
Streu Const Co.	32.33	1.51	34.02	1.62	38.76	1.49	78.56	1.43	10.55	1.56	194.22	1.50
Trierweiler	7.79	1.51	45.01	1.54	9.39	1.41	48.77	1.32	11.27	1.85	122.23	1.47
Vinton			29.46	1.58	54.18	1.44	24.74	1.54			108.38	1.50
Zignego	29.56	1.48	22.92	1.44	4.41	1.98	38.43	1.51			95.32	1.51
TOTAL	107.32	1.55	198.07	1.56	149.09	1.55	246.84	1.45	64.36	1.57	765.68	1.57

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

5 YEARS CONSTRUCTION DATA

5 YEAR AVERAGE BY CONTRACTOR

Hot Mix Asphaltic Concrete Pavement – IRI

Contractor	1991		1992		1993		1994		1995		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	23.20	1.16	24.81	1.35	30.87	1.05	72.10	1.00	28.05	1.31	179.03	1.13
Bacco							19.41	1.04			19.41	1.04
Barron County									7.88	1.34	7.88	1.34
B.R. Amon & Sons	64.50	1.31	63.19	1.17	46.91	0.99	105.01	0.98	37.27	1.05	316.88	1.09
Clark County					5.98	1.02			10.47	1.19	16.45	1.13
Fox Valley Const	17.29	1.45	16.55	1.12	5.06	0.95					38.90	1.24
D.L. Gasser					11.24	1.07	4.89	1.65	18.64	0.87	34.77	1.04
Hoffman Construction Co.	19.13	1.21									19.13	1.21
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	105.67	1.25	322.77	1.17	427.09	1.00	450.96	0.96	233.62	1.09	1540.11	1.05
Milwaukee General					1.33	2.35					1.33	2.35
Monarch			16.85	1.51	54.28	1.03	47.23	0.92	22.87	0.99	141.23	1.04
Munson Bros. Inc.					1.29	2.10					1.29	2.10
Murphy Construction			4.94	1.25	7.60	1.13					12.54	1.18
Northeast Asphalt			274.68	1.08	218.86	1.03	217.64	0.78	128.52	0.89	839.70	0.96
Payne & Dolan	43.50	1.35	195.08	1.25	92.85	1.03	212.94	1.09	39.19	0.94	583.56	1.14
Pitlick & Wick Inc.	10.86	0.96	3.49	1.17	13.70	0.94	4.31	0.84			32.36	0.96
Ptaschinski Const.,Inc.									1.47	1.75	1.47	1.75
Reliance Const.	10.20	1.17									10.20	1.17
Rodrigues					4.67	1.49					4.67	1.49
Rock Road of Wisc	26.08	1.04	38.50	1.17	46.53	1.03	9.29	1.00	8.95	0.96	129.35	1.07
Scott Const. Co	13.52	1.35									13.52	1.35
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	333.95	1.23	1023.99	1.02	1023.97	1.22	1145.47	0.88	536.93	1.13	4064.31	1.26

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

CONSTRUCTION DATA

5 YEAR AVERAGE BY SURFACE TYPE

IRI

Pavement Type	1991 Lane Miles Tested	1991 Avg IRI	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	Total Lane Miles Tested	Total Avg IRI
PCC PAVEMENTS												
Slipform – Jointed	107.31	1.51	198.07	1.54	134.91	1.48	246.85	1.43	64.36	1.45	751.50	1.48

IRI

Pavement Type	1991 Lane Miles Tested	1991 Avg IRI	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	Total Lane Miles Tested	Total Avg IRI
Standard Plant Mix –												
Asphaltic Concrete	206.64	1.26	261.41	1.21							468.05	1.23
Single Aggregate	53.27	1.31	206.70	1.26							259.97	1.27
Recycled	46.98	1.08	239.53	1.16	57.47	1.04	48.34	0.98	8.57	1.05	400.89	1.11
Rut Resistant	27.05	1.26	316.35	1.12							343.40	1.13
Stone Matrix –												
Asphaltic Concrete					96.41	1.08	74.40	1.37	43.18	0.87	213.99	1.14
High Volume					191.73	1.00	233.96	0.88	83.24	0.92	508.93	0.93
Medium Volume					498.69	1.04	623.49	0.92	319.60	1.03	1441.78	0.99
Low Volume					115.88	1.04	165.28	1.03	82.33	1.22	363.49	1.08
Special Mix					63.79	1.12					63.79	1.12
Total	333.94	1.24	1023.99	1.18	1023.97	1.04	1145.47	0.96	536.92	1.03	4064.29	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	1991 Lane Miles Tested	1991 Avg IRI	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	Total Lane Miles Tested	Total Avg IRI
Jointed:												
8.0"			19.50	1.78							19.50	1.78
9.0"	41.75	1.54	35.93	1.51	56.78	1.48	72.44	1.46	21.82	1.71	228.72	1.51
10.0"	56.34	1.51	12.74	1.62	92.31	1.48	33.29	1.40			194.68	1.48
11.0"	9.22	1.78	40.62	1.54			109.34	1.37	9.12	1.62	168.30	1.45
12".0			89.28	1.41			31.77	1.66	33.42	1.24	154.47	1.42
Joint Repair & Patching												
Doweling:												
Basket	78.86	1.54	126.14	1.54	50.77	1.44	109.59	1.44	11.27	1.85	376.63	1.51
Inserted	28.42	1.48	71.93	1.41	98.32	1.48	137.25	1.43	53.09	1.37	389.01	1.43
Doweled												
8.0"	1.66		19.50	1.78							21.16	1.64
9.0"	41.75	1.54	35.93	1.51	56.78	1.44	72.44	1.46	21.82	1.71	228.72	1.50
10.0"	56.34	1.51	12.74	1.62	92.31	1.48	33.29	1.40			194.68	1.48
11.0"	9.22	1.78	40.62	1.54			109.34	1.37	9.12	1.62	168.30	1.45
12.0"			89.28	1.41			31.77	1.66	33.42	1.24	154.47	1.42
Base:												
OGBC	30.05	1.54			126.20	1.48	154.44	1.49	23.48	1.58	334.17	1.50
DGBC					22.89	1.41	92.40	1.35	40.88	1.38	156.17	1.37
CABC												
Other												
Patch &Grind												
Joint Repair & Patching												
Joint Spacing:												
Random	107.31	1.58	198.07	1.51	120.68	1.44	239.40	1.42	52.48	1.36	717.94	1.47
20					28.41	1.51	7.44	1.97	11.88	1.84	47.73	1.66

* IRI is reported in m/km

PROFILER ROAD MEASUREMENTS

CONSTRUCTION PROJECT DATA

AVERAGE BY CONSTRUCTION TECHNIQUE

Hot Mix Asphaltic Concrete Pavements

Type of Technique	1991 Lane Miles Tested	1991 Avg IRI	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	Total Lane Miles Tested	Total Avg IRI
Depth:												
7.00*							19.14	0.80			19.14	0.80
6.00*			4.35	0.96	22.30	1.26	7.96	1.00	4.62	0.89	39.23	1.13
5.50*	26.08	1.04	51.71	1.30	37.65	1.21	76.67	1.01	10.03	1.15	202.14	1.13
5.00*	41.58	1.26	145.21	1.21	159.58	1.00	129.40	0.91	140.97	0.87	616.74	1.02
4.50*	10.86	0.96	151.64	1.16	196.53	0.96	74.37	0.84	12.33	0.82	445.73	1.00
4.00*	82.65	1.26	218.84	1.08	54.60	1.08	81.23	0.88	36.49	1.27	473.81	1.09
3.75*							27.08	1.04	15.92	0.87	43.00	0.98
3.50*	91.55	1.16	108.55	1.12	112.11	0.96	106.77	0.86	32.32	1.17	451.30	1.03
3.25*									18.56	0.92	18.56	0.92
3.00*	54.17	1.30	240.22	1.21	277.29	1.12	283.72	0.93	143.06	1.01	998.46	1.08
2.75*							8.43	0.97			8.43	0.97
2.50*			31.41	1.12	17.53	1.12	46.68	1.01	28.65	1.17	124.27	1.09
2.25*							14.47	1.09			14.47	1.09
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			41.77	0.72
1.50*	27.05	1.26	28.40	1.36	56.58	1.12	28.57	0.89	39.61	1.27	180.21	1.18
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			70.10	1.19
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			70.16	0.88
Crack & Seat			6.00	1.57							6.00	1.57
New Base	97.10	1.30	324.34	1.21	245.98	1.16	212.12	0.88	99.00	0.96	978.54	1.11
Old AC	91.83	1.16	47.48	1.16	211.28	1.00	292.32	0.95	142.94	1.14	785.85	1.04
Old PCC	29.24	1.16	161.47	1.16	259.78	1.12	130.72	1.16	99.83	0.88	681.04	1.10
Milled	115.77	1.16	455.47	1.08	324.46	1.04	354.94	0.97	151.01	1.03	1401.65	1.04
Other							3.48	1.01			3.48	1.01
Total	667.88	1.18	2092.77	1.19	2186.93	1.11	2268.32	0.95	1073.83	1.04	8289.73	1.08

* IRI is reported in m/km