

Mn/DOT Experience with OBSI

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**TRB 2010
Noise Workshop**

OBSI RESEARCH INVESTIGATION & DEPLOYMENT

- Seasonal Evaluation of All MnROAD Cells
- Evaluation of Innovative Grind TPF 5-134
- TH 94, Brandon MN
- TH 94 Near St Cloud
- TH 35 in Duluth 2008
- SP 6925-127 TH 61 SP 6982-290 TH 35
Duluth

Seasonal Surface Evaluation

- MnROAD 56 Test cells (2 lanes each) are tested every season.
- OBSI AASHTO TP 76-08,
 - FRICTION ASTM E-274,
 - TEXTURE (CTM) ASTM E2157
 - TEXTURE (SVT) ASTM E-965
 - IRI ASTM E- 950, E-867
 - SOUND ABSORPTION (ASTM E-1050)
- OBSI database for MnROAD Cells now available

EVALUATION OF INNOVATIVE GRIND

INNOVATIVE Cell 7

	Leading Edge			Trailing Edge			AVG	
	IL	PI	Coh	IL	PI	Coh	IL	
250	87.0		-0.9	0.4	77.9	9.1	0.5	84.5
315	81.0		3.6	0.5	85.1	1.1	0.6	83.5
400	83.2		1.4	0.7	82.3	2.5	0.7	82.7
500	82.3		1.9	0.9	79.5	4.8	0.8	81.1
630	83.1		2.2	1.0	81.1	4.0	0.9	82.3
800	88.1		1.2	1.0	88.4	1.4	1.0	88.3
1000	93.9		0.8	1.0	93.5	0.9	1.0	93.7
1250	89.8		0.7	1.0	92.9	0.7	1.0	91.6
1600	88.9		1.1	1.0	88.8	1.0	1.0	88.8
2000	88.6		1.2	1.0	88.9	1.0	1.0	88.7
2500	86.2		1.1	1.0	87.6	0.6	1.0	87.0
3150	80.9		0.8	1.0	82.1	0.6	0.9	81.5
4000	77.3		1.3	0.8	78.6	0.9	0.9	78.0
5000	74.1		1.6	0.7	74.1	1.2	0.8	74.1
A-wtd	98.2				98.7			98.5

CONVENTIONAL Cell 8

	Leading Edge			Trailing Edge			AVG	
	IL	PI	Coh	IL	PI	Coh	IL	
250	82.8		4.5	0.6	82.4	5.1	0.5	82.6
315	87.0		1.4	0.8	89.2	-0.8	0.7	88.2
400	90.3		0.9	1.0	88.2	0.5	0.8	89.4
500	91.5		1.3	1.0	89.7	1.6	1.0	90.7
630	95.8		1.2	1.0	92.9	1.6	1.0	94.6
800	100.3		0.4	1.0	97.5	0.5	1.0	99.1
1000	95.3		0.9	1.0	96.9	0.8	1.0	96.2
1250	92.7		0.5	1.0	94.6	0.8	1.0	93.8
1600	89.4		0.8	1.0	90.1	0.8	1.0	89.7
2000	86.8		1.1	1.0	85.9	1.2	1.0	86.4
2500	83.9		1.1	1.0	83.3	1.3	1.0	83.6
3150	80.2		1.0	0.9	79.4	1.2	0.9	79.8
4000	76.4		1.3	0.8	75.8	1.6	0.8	76.1
5000	73.8		1.8	0.7	72.6	2.0	0.7	73.2
A-wtd	103.6				102.6			103.1

OBSI is the Main Evaluation Tool

TH 94 in Alex Pre-grind

Location	Test No.	Leading Edge	Trailing Edge	Average
M.P. 78.9	11	107.4	107.0	107.2
	31	108.4	108.2	108.3
	51	108.3	107.9	108.1
M.P. 78.8	12	108.6	108.2	108.4
	32	108.7	108.5	108.6
	52	108.1	107.8	107.9
M.P. 78.7	13	107.9	107.4	107.6
	33	108.1	107.6	107.8
	53	107.7	107.3	107.5
M.P. 78.6	14	108.6	108.3	108.5
	24	108.7	108.3	108.5
	54	107.9	107.5	107.7
M.P. 78.5	15	107.4	107.0	107.2
	35	108.0	107.8	107.9
	55	108.3	108.0	108.1
M.P. 78.4	16	107.8	107.4	107.6
	36	107.9	107.6	107.8
	56	107.6	107.4	107.5
M.P. 78.3	17	108.1	107.6	107.8
	37	108.4	107.9	108.1
	57	108.3	107.8	108.1
M.P. 78.2	18	107.8	107.4	107.6
	38	108.1	107.5	107.8
	58	108.1	107.7	107.9
M.P. 78.1	19	107.0	106.5	106.8
	39	107.9	107.5	107.7
	59	107.7	107.5	107.6
M.P. 78.0	20	108.4	108.0	108.2
	40	108.0	107.7	107.8
	60	108.5	108.1	108.3

TH 94 in Alex CONV Ground

Location	Test No.	Leading Edge	Trailing Edge	Average
M.P. 85.9	1	104.3	103.0	103.9
	21	104.1	103.4	103.7
	41	104.2	103.6	103.9
M.P. 85.8	2	103.4	102.7	103.1
	22	103.3	102.8	103.0
	42	103.1	102.6	102.8
M.P. 85.7	3	102.9	101.8	102.1
	23	102.7	102.0	102.4
	43	102.7	102.1	102.4
M.P. 85.6	4	103.0	102.2	102.6
	24	103.4	102.7	103.1
	44	102.9	102.2	102.5
M.P. 85.5	5	102.8	102.2	102.5
	25	103.0	102.4	102.7
	45	103.2	102.8	102.9
M.P. 85.4	6	103.3	102.6	102.9
	26	103.1	102.4	102.8
	46	103.2	102.8	102.9
M.P. 85.3	7	103.1	102.4	102.7
	27	103.8	103.1	103.5
	47	103.2	102.6	102.8
M.P. 85.2	8	104.2	103.6	103.9
	28	104.4	103.8	104.0
	48	103.7	103.1	103.4
M.P. 85.1	9	104.2	103.6	103.9
	29	104.3	103.6	103.9
	49	104.0	103.3	103.7
M.P. 85.0	10	104.2	103.8	103.9
	30	104.2	103.6	103.9
	60	104.6	103.7	104.1

EDGWATER HOTEL DULUTH

- **Mn/DOT Received noise Complaints from Edge water Hotel**
- **Residents believed the noise was coming from the Pavements.**
- **Someone in the District heard that we could determine if a pavement was quiet or not. (OBSI)**

....In response to your request, an On-Board Sound Intensity (OBSI) test was conducted on the pavement surface on TH 35 proximate to Edgewater Hotel in Duluth. The Test was conducted at approximately 4:00PM on Tuesday the 30th of October 2007 by the crew from the Research Section of the Mn/DOT Office of Materials & Roads Research.

Excerpt of Communication with District Office

RESULTS FOR EDGEWATER EVALUATION

TABLE 1 OBSI RESULTS

S.B. run starts @ Edgewater Hotel
at end of noisewall- (2) tests taken in series
N.B. runs starts at plane mark by O.H. sign
for London Rd/ Highway 61 exit. (2) tests taken in series.
All tests in rt.
Lane.

O.B.S.I. Data Sheet

Date: 10/30/2007

Operator: J. Pantelis, T. Snyder

Location	Test No.	Leading Edge	Trailing Edge	Average	Location
I-35 S.B.	1	105.1	104.7	104.9	Adjacent to Hotel
	7	106.1	105.9	105.9	
	11	105.6	105.4	105.5	
I-35 S.B.	2	104.3	103.9	104.1	Adjacent to Hotel
	8	105.4	105.0	105.2	
	12	106.6	105.9	106.2	
I-35 N.B.	3	107.0	106.3	106.6	Adjacent to Hotel
	5	107.6	107.0	107.3	
	9	106.8	106.4	106.6	
I-35 N.B.	4	104.2	103.6	103.9	Adjacent to Hotel
	6	106.6	106.0	106.3	
	10	106.9	106.2	106.6	

Calibration
*

	Mic 1	Mic 2	Mic 3	Mic 4	
Cal. 1					<u>AM</u>
Cal. 2					

	Mic 1	Mic 2	Mic 3	Mic 4	
Cal. 1	1.032	1.074	1.077	1.078	PM
Cal. 2	1.031	1.074	1.076	1.076	

* Calib. Should be done 2 times daily

Tests 1,7,11, 4,6,&10 are adjacent to Edgewater Hotel

CONCLUDED THAT PAVEMENT WAS NOISY RECOMMENDED GRINDING

Current Initiatives

- Parallel OBSI and SPB to validate far field correlations
- Mn/DOT / TPF 5-134 on Contract with HDR to perform parallel SPB to Mn/DOT's OBSI.
- 1000-ft 4-lane section on TH 94 near St Cloud.
- Porous concrete, pavement asphalt acoustic evaluation.
- Evaluation of new textures at MnROAD

Conclusion

- There is a high level of awareness of OBSI as an evaluation tool for pavement noise evaluation.
- Accentuated by Mn/DOT Green pavement Initiatives:
 - Innovative Grinding
 - Porous asphalt
 - Pervious Concrete
 - Porous Concrete Overlay
- Environmental office awaits results of parallel testing.
- Data requests are welcome:
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SKATER'S CHOICE!!!!

