Wisconsin Experience with Profiler Certification and Ride Specifications

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WisDOT Profiler Certification

- Test sections established and marked out on asphalt and concrete pavement
  - –ICC SurPro 2000 Reference profiler used to establish a standard for the test sections http://www.surproprofiler.com/surpro_report.pdf
  - –Candidates make five passes on each test section
  - –ERD profile data files are analyzed in ProVAL's Profiler Certification Module
  - –A 92 repeatability score and 90 percent accuracy is required to obtain profiler certification

2008 Profiler Roadeo Notification

Note: Single Point Laser Devices are not eligible for approval on PCC Pavement.

All profilers will be required to make five runs on each test section for which approval is requested.

Single sensor profilers capable of measuring a single wheel path will only be required to test one wheel path of a lane.

Portable devices that can be transferred to different vehicles must demonstrate satisfactory test results for each host vehicle for which approval is requested.

WisDOT 2008 Roadeo Sites

- ICC SurPro 2000

Marking out Profiler Test Site at Road America in Elkhart Lake, Wisconsin

Marking out Profiler Test Site on closed section of USH 151 near Fond du Lac, Wisconsin

WisDOT Profiler Roadeo

- HMA Test Sites for the Roadeo have been located on a section of existing HMA Pavement with a relatively high IRI, 150 in./mi. or greater
- PCC Test Sites have been on newer sections of longitudinally tined PCC Pavement with15 ft joint spacing with an IRI below 75 in./mi.

Profiler Approval

–Profile data is submitted immediately after testing

–Data analyzed on-site using ProVAL Certification Module

–Approval of each profiler is determined within minutes after testing is completed

–Profilers not approved may perform and submit additional runs for approval after adjustments are made

–Approved Profilers are listed on the WisDOT Ride Website:

http://roadwaystandards.dot.wi.gov/standards/qmp/profilers.pdf

Profiler Re-Approval

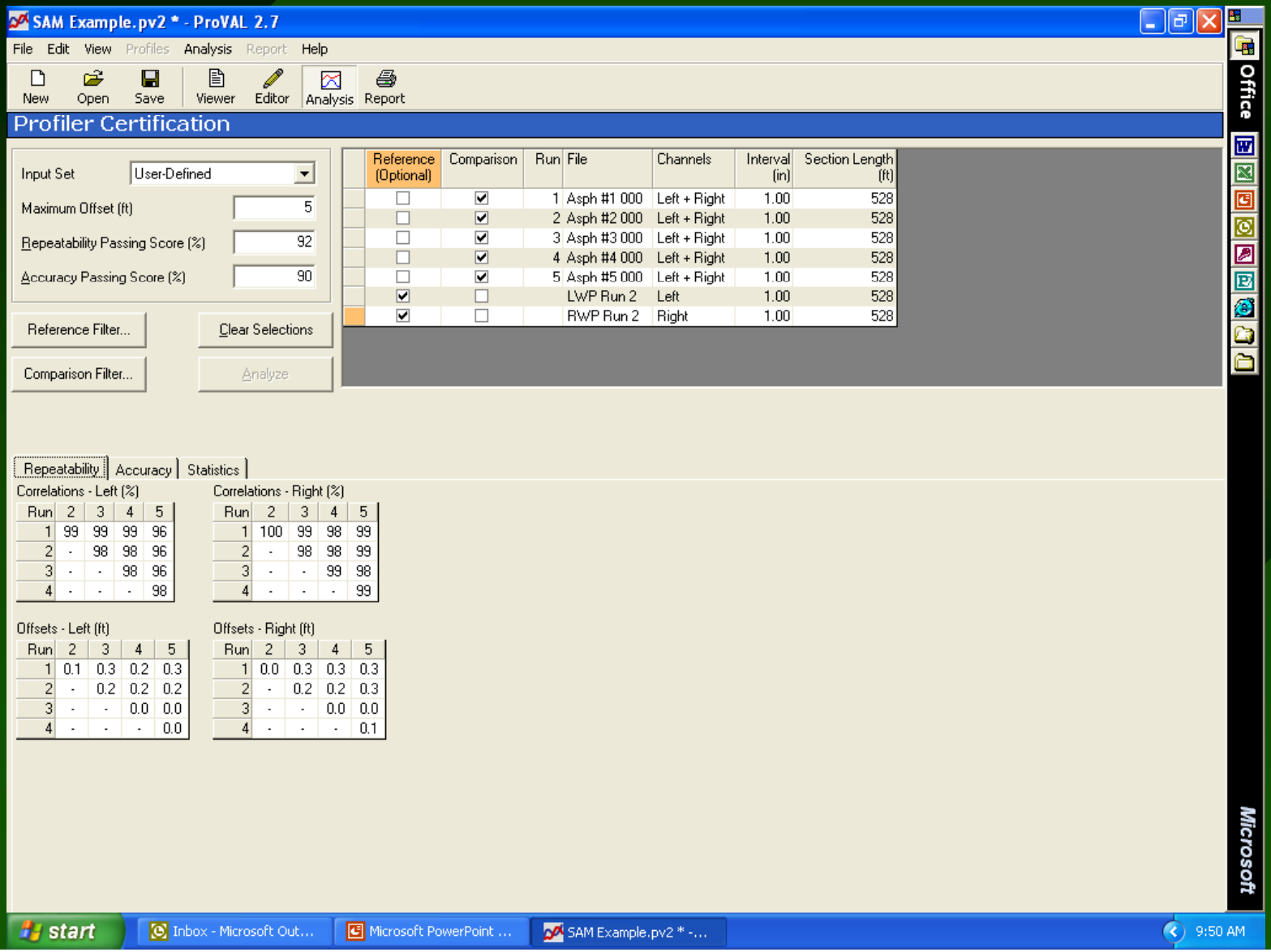
–When repairs or adjustment are made

–When problems or inconsistencies are identified during calibration or verification testing

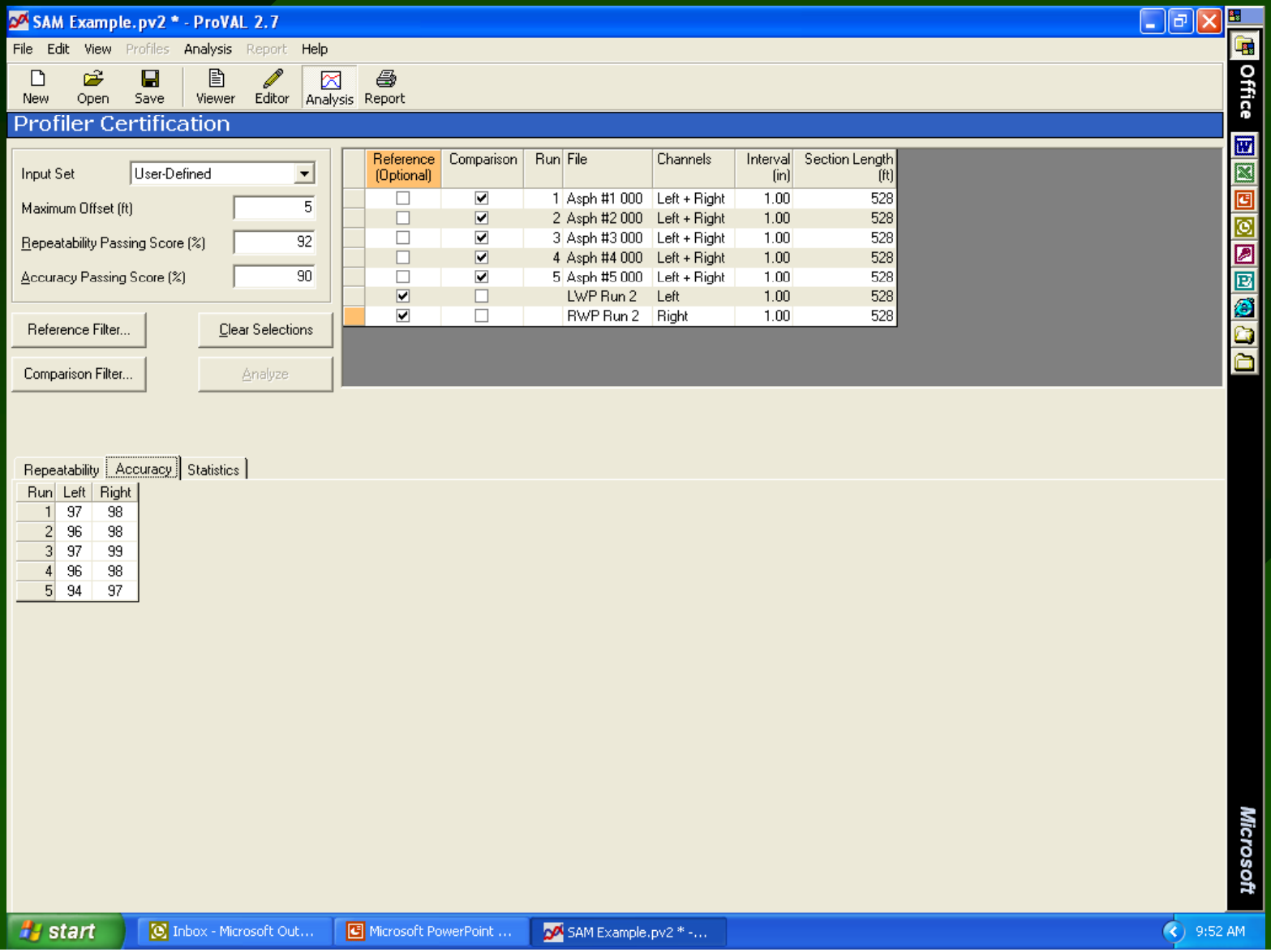
–Testing is performed at original test site when possible or a new test site is set up when needed.

–Same process as performed for approval is used

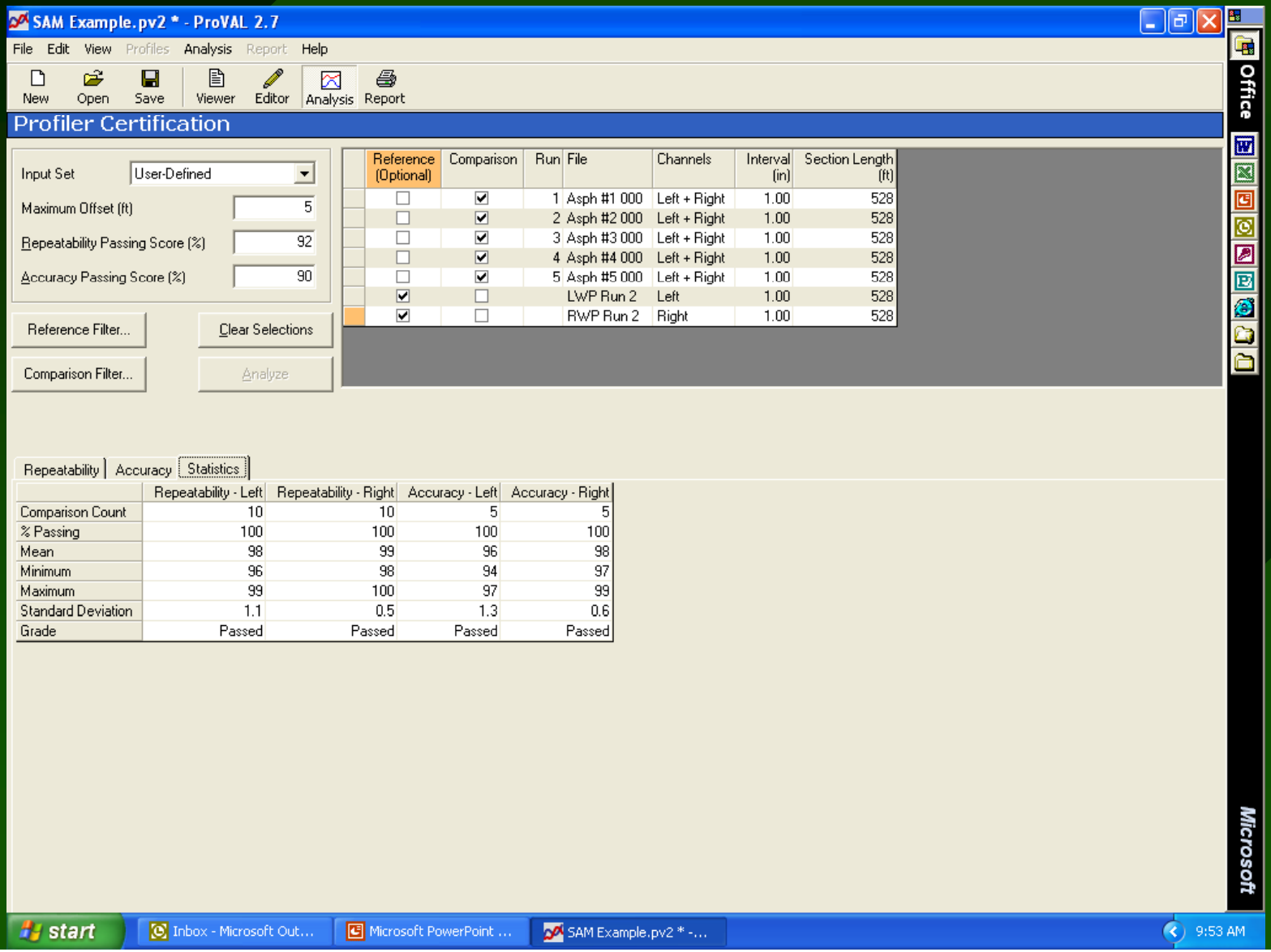
Profiler Repeatability



Profiler Accuracy



Profiler Certification Statistics



WisDOT IRI Ride Spec.

Wisconsin introduced a new IRI Ride specification in 2006.

March - Three Day Smoothathon Event – WisDOT, FHWA, UW Platteville, the Highway Technician Certification Program and the Transtec Group.

March thru May - Meetings held in all the WisDOT regional offices to inform everyone of changes in the ride spec.

April/May - Additional meetings with contractors, consultants and contract administration personnel.

Now/Future – Wisconsin Specific ProVAL and MRS Training

http://roadwaystandards.dot.wi.gov/standards/qmp/440-010line.pdf

WisDOT 2008 IRI Ride Spec.

Spec Highlights:

- Pavement longer than a mile with a speed limit 45 mph or greater
- Quality Control Plan
- Profiled from beginning to end without exclusion.
- Bonus, penalty or corrective action based on IRI results for 500 foot segments
- Localized Roughness when IRI - 25 foot moving average exceeds 175 in./mi.
- Penalty, corrective action or forgiveness for Localized Roughness

WisDOT 2008 IRI Ride Spec.

HMA Pavement Categories

CATEGORY	DESCRIPTION
HMA I	Asphalt pavement with multiple opportunities to achieve a smooth ride. The following operations performed under this contract are considered as opportunities: a layer of HMA, a leveling or wedging layer of HMA, and diamond grinding or milling of the underlying pavement surface.

WisDOT 2008 IRI Ride Spec.

HMA Pavement Categories

CATEGORY	DESCRIPTION
HMA II	Asphalt pavement with a single opportunity to achieve a smooth ride.
HMA III	Asphalt pavement segments containing any portion of a bridge, bridge approach, railroad crossing, or intersection. An intersection is defined as the area within the points of curvature of the intersection radii.

WisDOT 2008 IRI Ride Spec.

PCC Pavement Categories

CATEGORY	DESCRIPTION
PCC II	Concrete pavement including all gaps.
PCC III	Concrete pavement segments containing any portion of a bridge, bridge approach, railroad crossing, or intersection. An intersection is defined as the area within the points of curvature of the intersection radii.

WisDOT 2008 IRI Ride Spec.

500 Foot Segment IRI Requirements

HMA I		HMA II and PCC II	
Initial IRI (inches/mile)	Pay Adjustment[1] (dollars per standard segment)	Initial IRI (inches/mile)	Pay Adjustment[1][2] (dollars per standard segment)
< 30	250	< 50	250
≥ 30 - < 35	1750 – (50 x IRI)	≥ 50 - < 55	2750 – (50 x IRI)
≥ 35 - < 60	0	≥ 55 - < 85	0
≥ 60 - < 75	1000 – (50/3 x IRI)	≥ 85 - < 100	(4250/3) – (50/3 x IRI)
≥ 75	- 250	≥ 100	- 250

WisDOT 2008 IRI Ride Spec.

500 Foot Segment Correction for High IRI

Corrective Actions for Excessive IRI

(1) If an individual segment IRI exceeds 140 in/mile (2210 mm/km) for HMA I, HMA II, and PCC II pavements after correction for localized roughness, the engineer may require the contractor to correct that segment. Correct the segment final surface as follows:

WisDOT 2008 IRI Ride Spec.

500 Foot Segment Correction for High IRI

Corrective Actions for Excessive IRI

(1) HMA I Correct to an IRI of 60 in/mile (947 mm/km) using whichever of the following methods the engineer directs:

- Mill and replace the full lane width of the riding surface excluding the paved shoulder.

- Correct the full lane width using techniques approved by the engineer.

WisDOT 2008 IRI Ride Spec.

500 Foot Segment Correction for High IRI

Corrective Actions for Excessive IRI

HMA II: Correct to an IRI of 85 in/mile (1342 mm/km) using whichever of the following methods the engineer directs:

- Mill and replace the full lane width of the riding surface excluding the paved shoulder.

- Correct the full lane width using techniques approved by the engineer.

WisDOT 2008 IRI Ride Spec.

500 Foot Segment Correction for High IRI

Corrective Actions for Excessive IRI

PCC II: Correct to an IRI of 85 in/mile (1342 mm/km) using whichever of the following methods the engineer directs:

- Continuous diamond grinding of the full lane width of the riding surface including adjustment of the paved shoulders.

- Correct the full lane width using techniques approved by the engineer.

WisDOT 2008 IRI Ride Spec.

Localized Roughness Provisions

Localized Roughness IRI (in/mile)	Pay Reduction[1] (dollars)
> 175	(Length in Feet) x (IRI - 175)

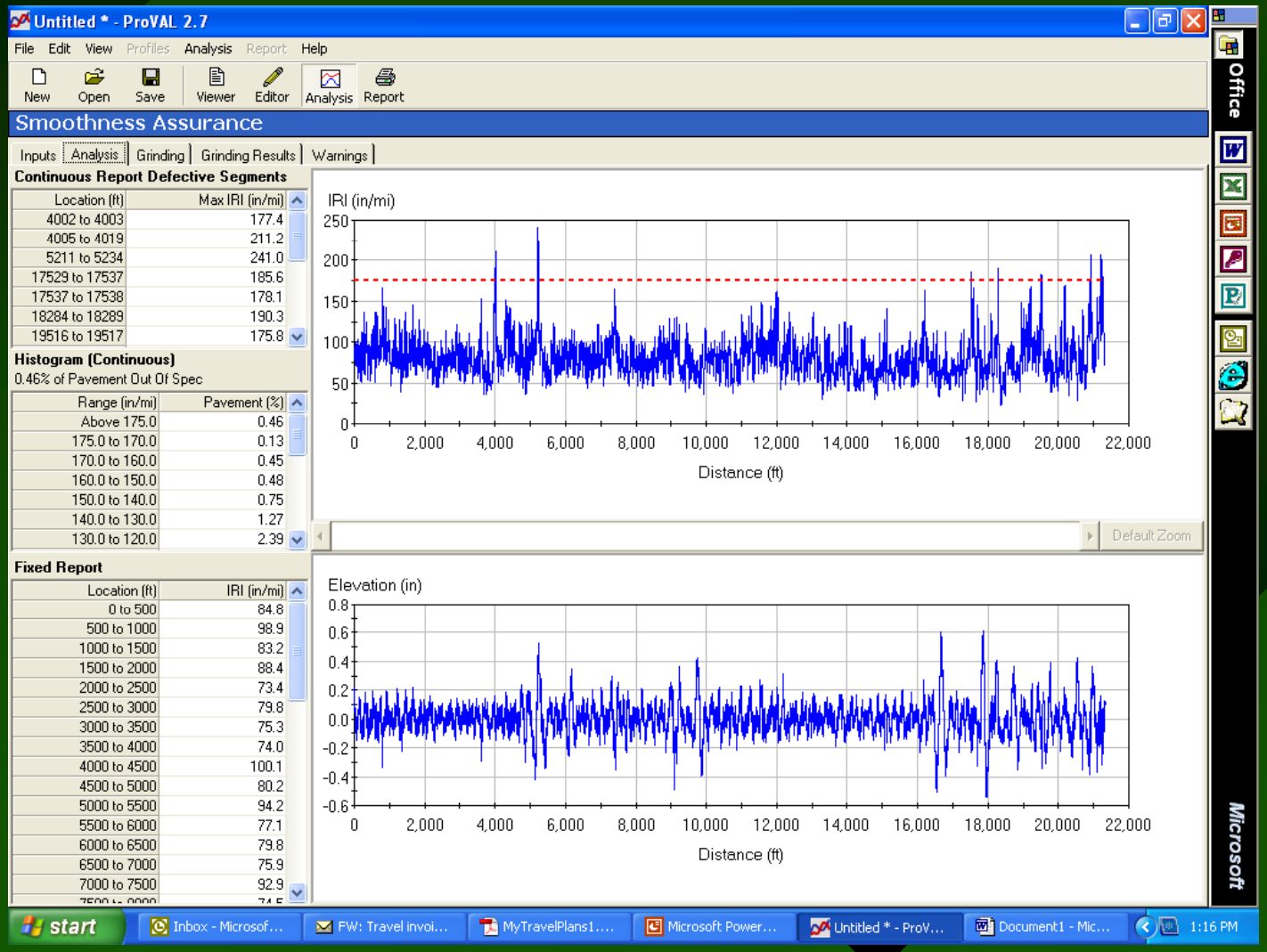
[1] **A maximum $250 pay reduction may be assessed for locations of localized roughness that are less than or equal to 25 feet (7.6 m) long. Locations longer than 25 feet (7.6 m) may be assessed a maximum pay reduction of $10 per foot (0.3 m).**

(3) **The engineer will not direct corrective action or assess a pay reduction for an area of localized roughness without independent identification of that area as determined by physically riding the pavement. For corrections, use only techniques the engineer approves.**

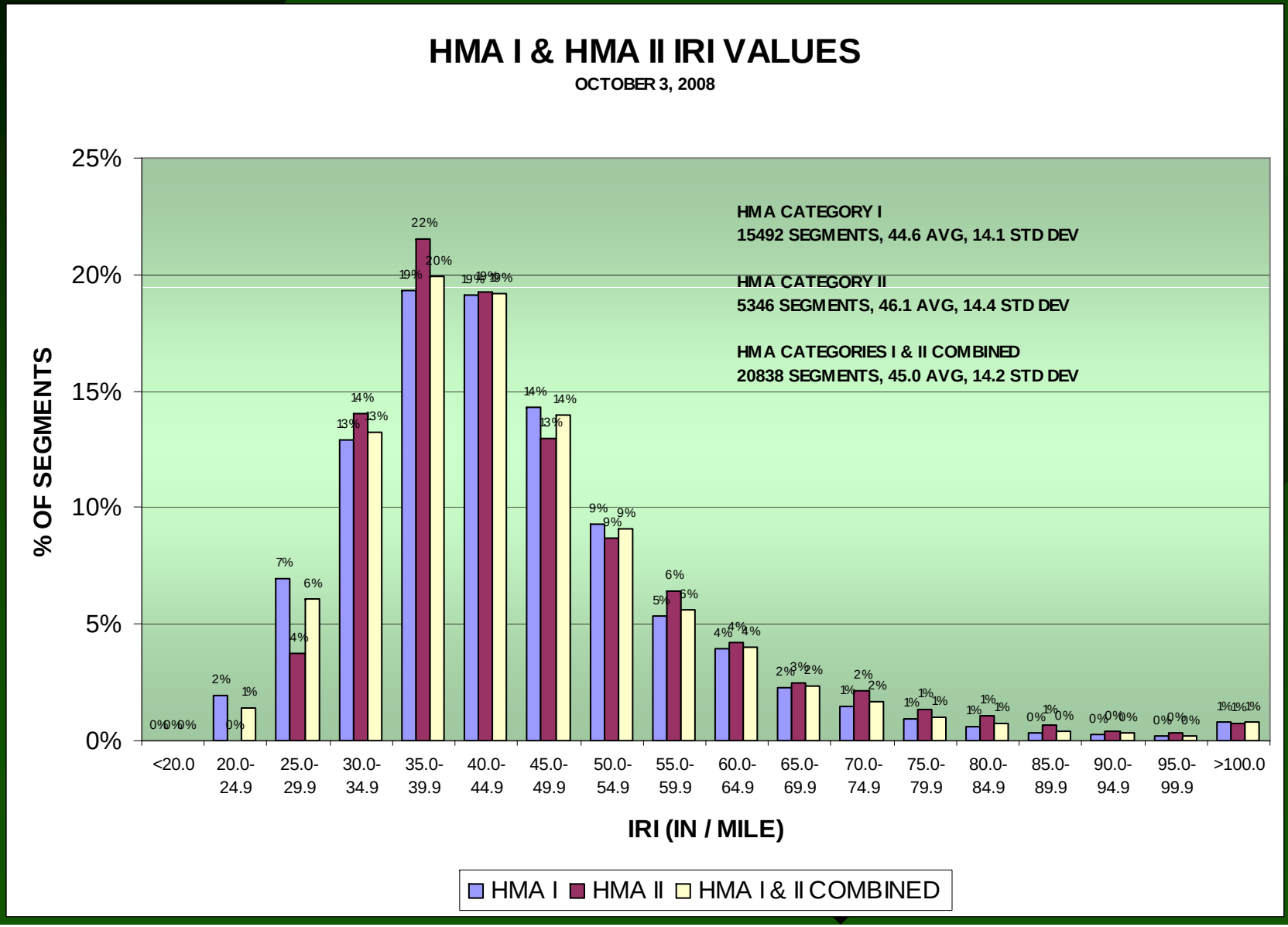
(4) **Re-profile corrected areas to verify that the IRI is less than 140 in/mile (2210 mm/km) after correction. Submit a revised ProVAL smoothness assurance report for the corrected areas to validate the results.**

WisDOT 2008 IRI Ride Spec.

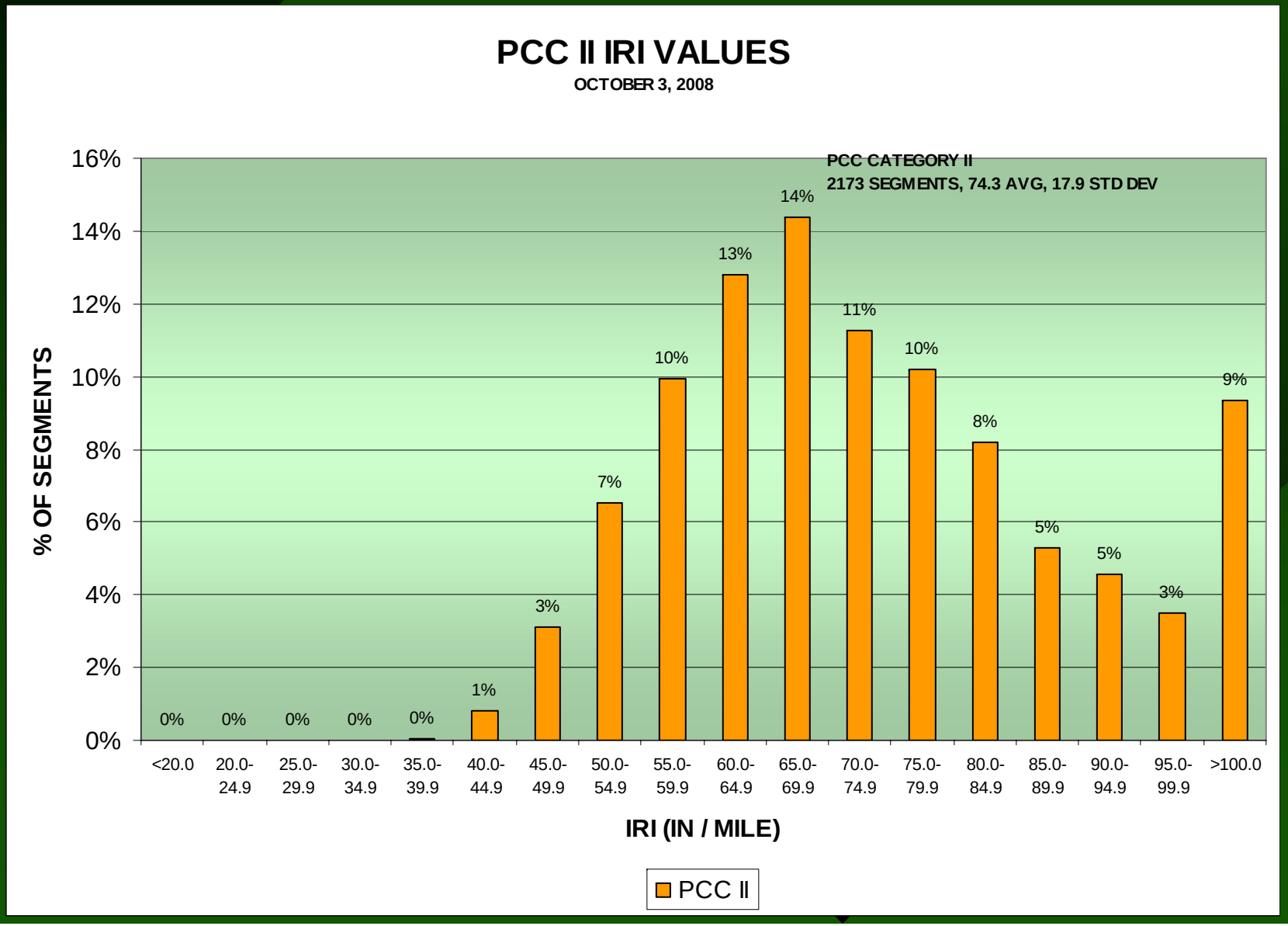
ProVAL Smoothness Assurance Module



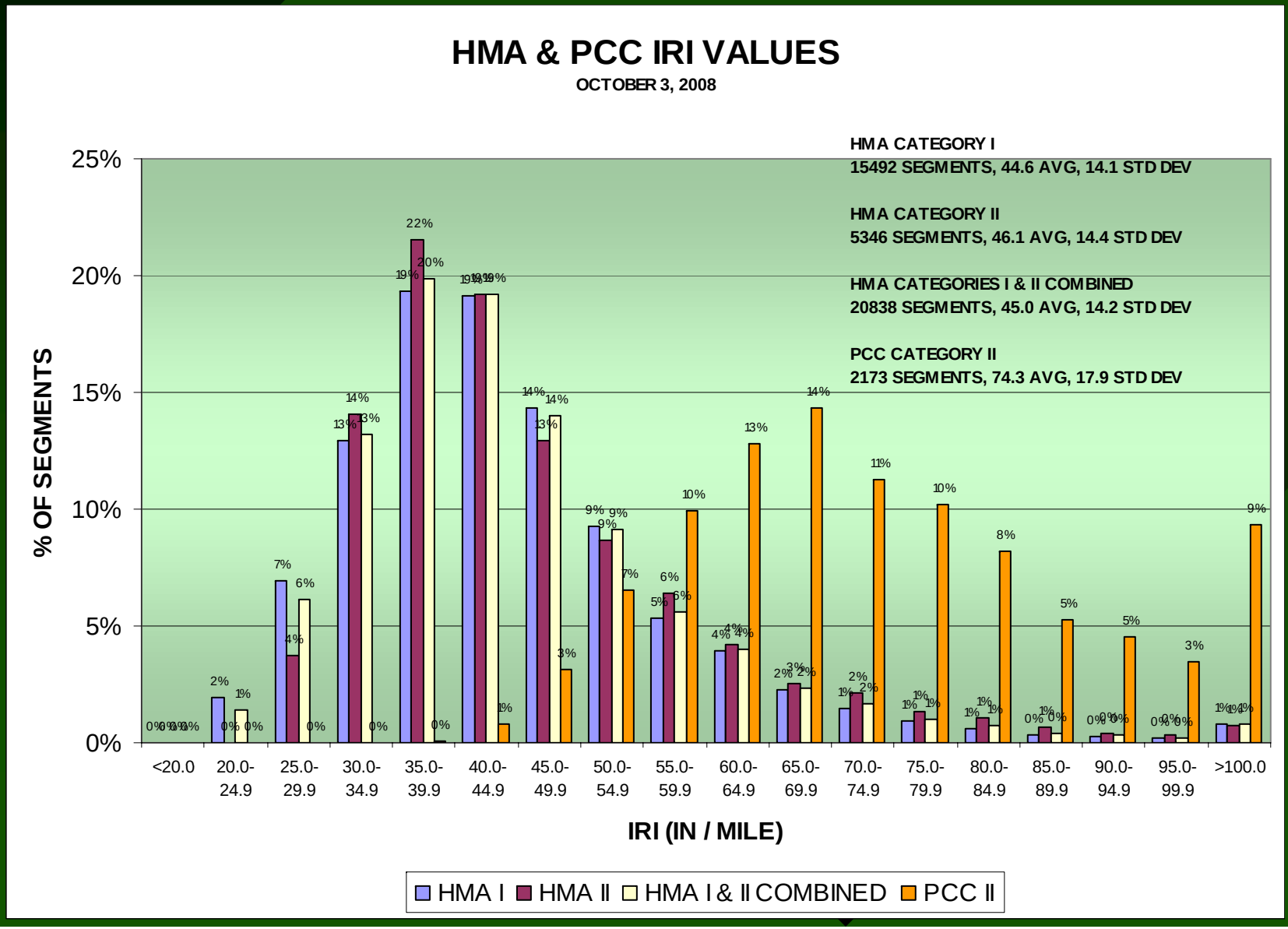
HMA I and II IRI Values



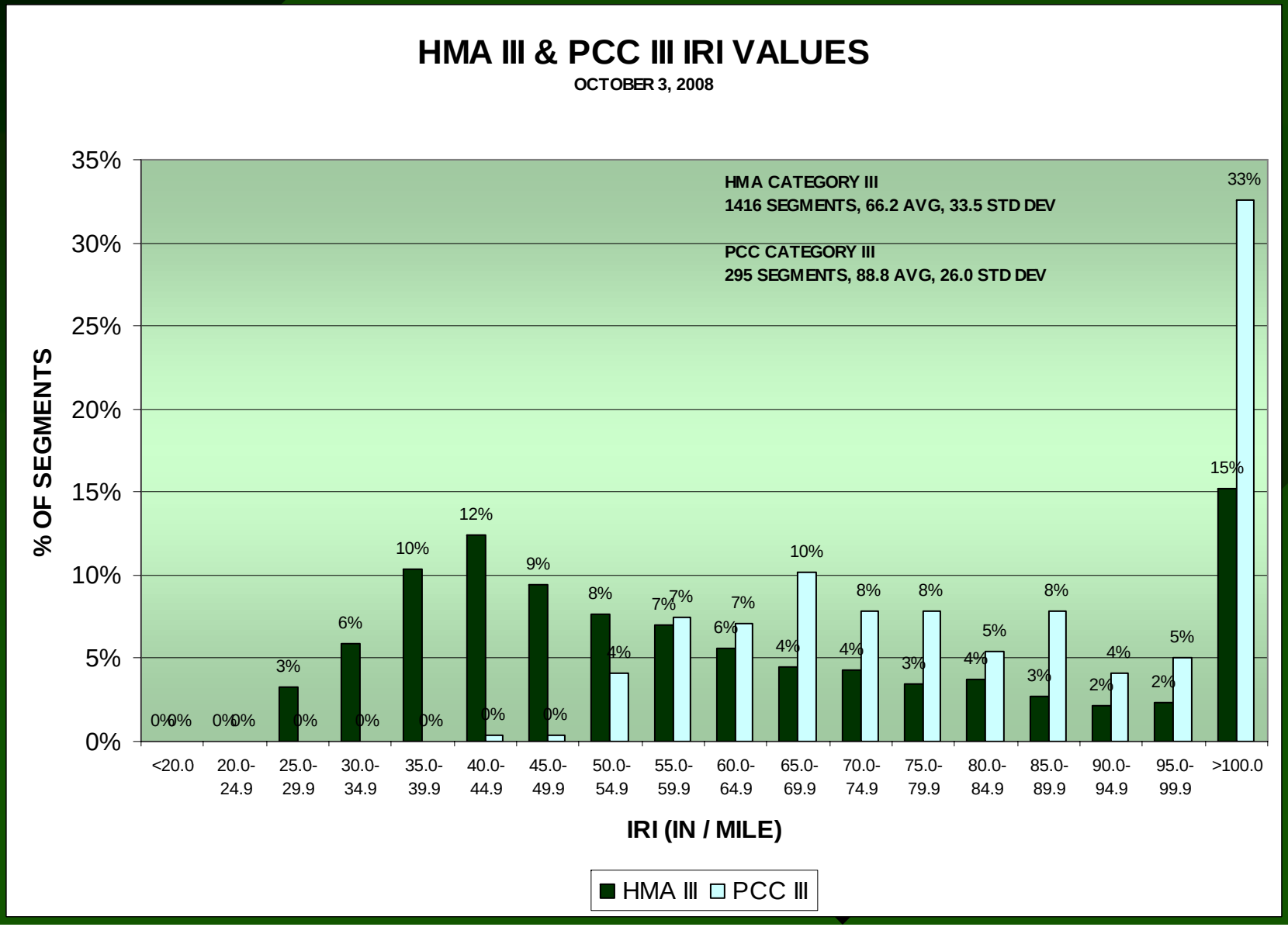
PCC II IRI Values



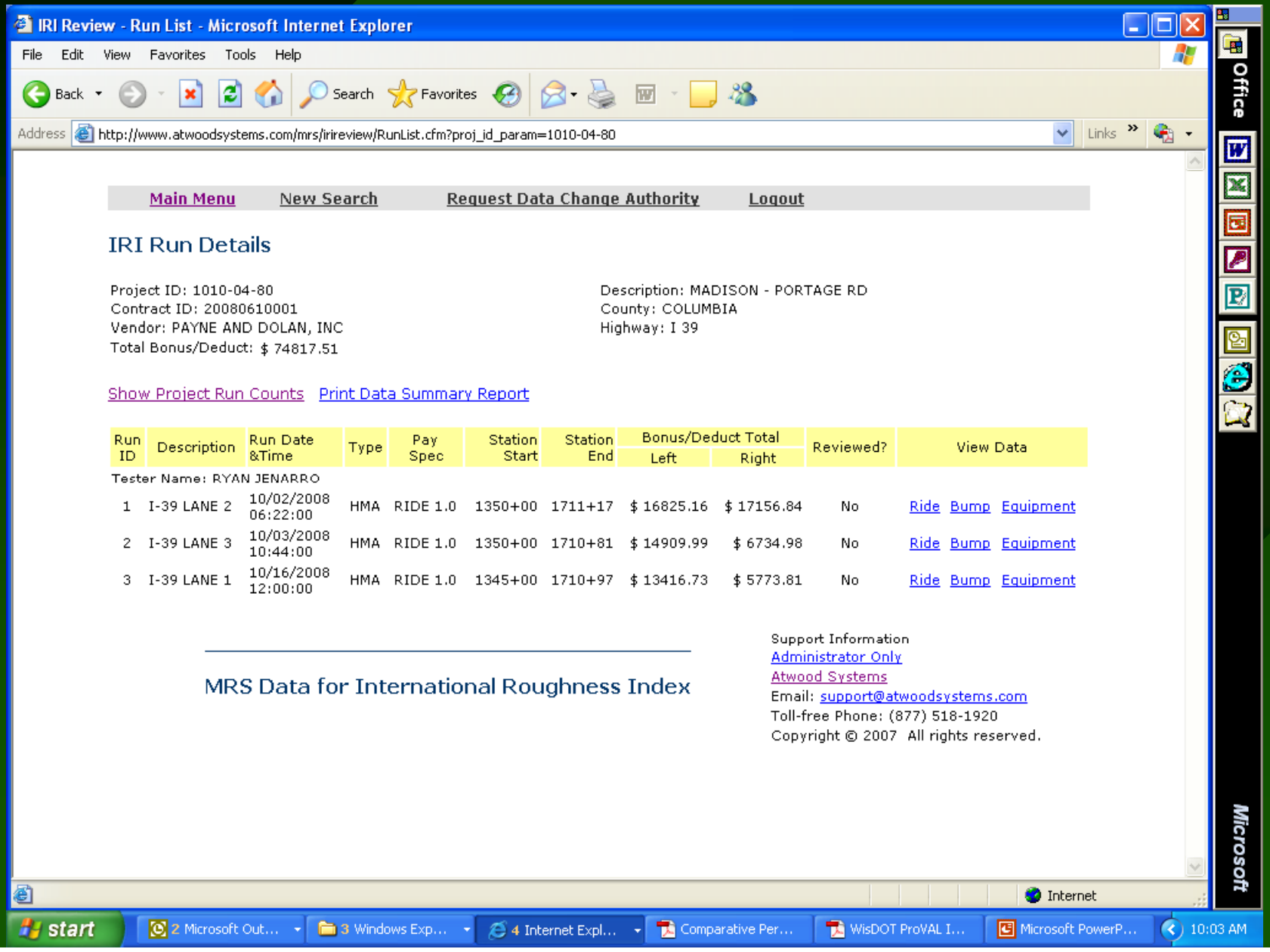
HMA and PCC IRI Values



Category III IRI Values



MRS IRI Data


IRI Review - Run List - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://www.atwoodsystems.com/mrs/irireview/RunList.cfm?proj_id_param=1010-04-80
Links
Main Menu New Search Request Data Change Authority Logout
IRI Run Details
Project ID: 1010-04-80
Contract ID: 20080610001
Vendor: PAYNE AND DOLAN, INC
Total Bonus/Deduct: $ 74817.51
Description: MADISON - PORTAGE RD
County: COLUMBIA
Highway: I 39
Show Project Run Counts Print Data Summary Report
Run ID | Description | Run Date &Time | Type | Pay Spec | Station Start | Station End | Bonus/Deduct Total Left | Bonus/Deduct Total Right | Reviewed? | View Data
Tester Name: RYAN JENARRO
1 I-39 LANE 2 10/02/2008 06:22:00 HMA RIDE 1.0 1350+00 1711+17 $ 16825.16 $ 17156.84 No Ride Bump Equipment
2 I-39 LANE 3 10/03/2008 10:44:00 HMA RIDE 1.0 1350+00 1710+81 $ 14909.99 $ 6734.98 No Ride Bump Equipment
3 I-39 LANE 1 10/16/2008 12:00:00 HMA RIDE 1.0 1345+00 1710+97 $ 13416.73 $ 5773.81 No Ride Bump Equipment
MRS Data for International Roughness Index
Support Information
Administrator Only
Atwood Systems
Email: support@atwoodsystems.com
Toll-free Phone: (877) 518-1920
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Internet
start
2 Microsoft Out...
3 Windows Exp...
4 Internet Expl...
Comparative Per...
WisDOT ProVAL I...
Microsoft PowerP...
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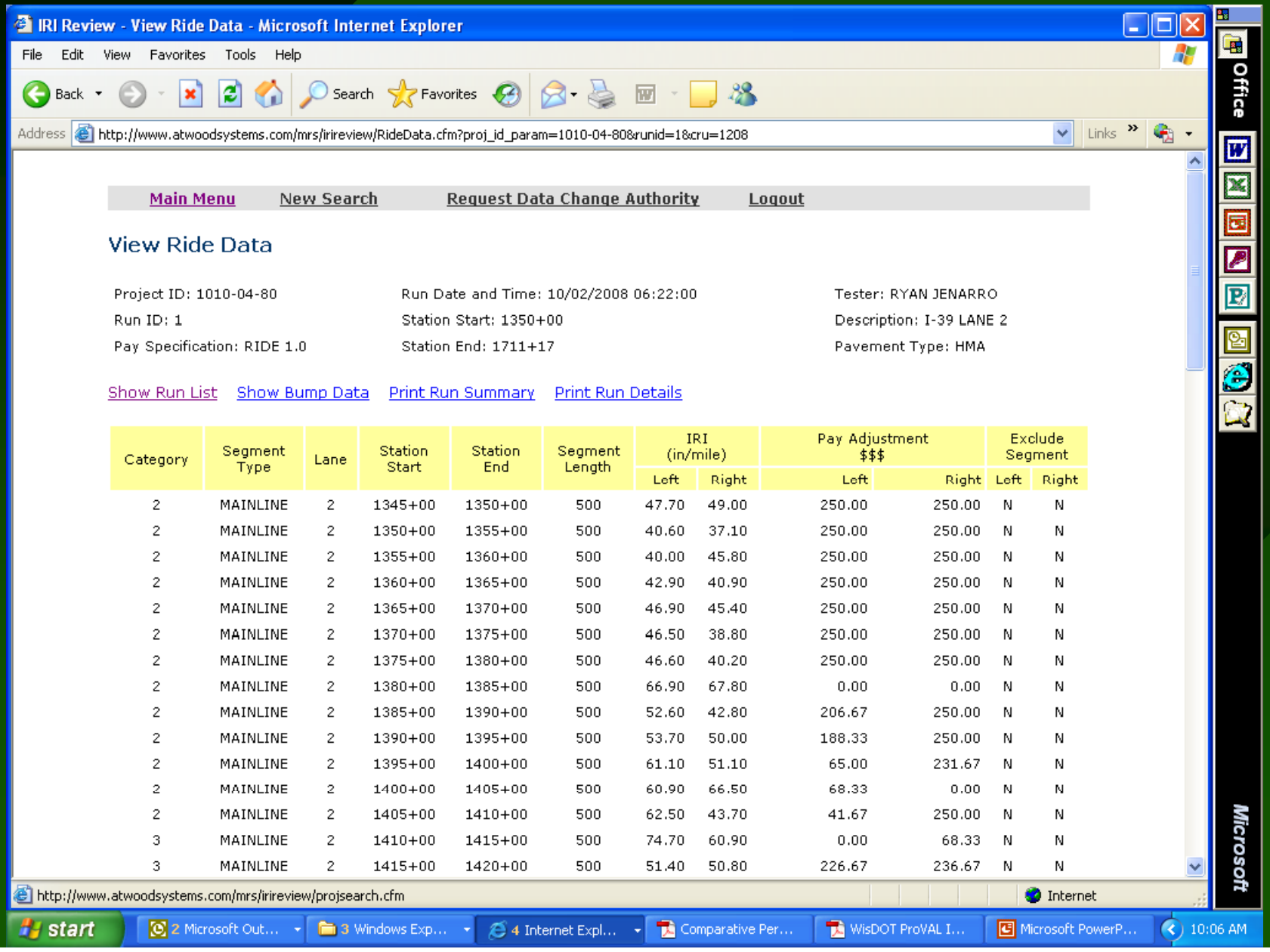
MRS IRI Data



Category	Segment Type	Lane	Station Start	Station End	Segment Length	IRI (in/mile)		Pay Adjustment $$$		Exclude Segment	
						Left	Right	Left	Right	Left	Right
2	MAINLINE	2	1345+00	1350+00	500	47.70	49.00	250.00	250.00	N	N
2	MAINLINE	2	1350+00	1355+00	500	40.60	37.10	250.00	250.00	N	N
2	MAINLINE	2	1355+00	1360+00	500	40.00	45.80	250.00	250.00	N	N
2	MAINLINE	2	1360+00	1365+00	500	42.90	40.90	250.00	250.00	N	N
2	MAINLINE	2	1365+00	1370+00	500	46.90	45.40	250.00	250.00	N	N
2	MAINLINE	2	1370+00	1375+00	500	46.50	38.80	250.00	250.00	N	N
2	MAINLINE	2	1375+00	1380+00	500	46.60	40.20	250.00	250.00	N	N
2	MAINLINE	2	1380+00	1385+00	500	66.90	67.80	0.00	0.00	N	N
2	MAINLINE	2	1385+00	1390+00	500	52.60	42.80	206.67	250.00	N	N
2	MAINLINE	2	1390+00	1395+00	500	53.70	50.00	188.33	250.00	N	N
2	MAINLINE	2	1395+00	1400+00	500	61.10	51.10	65.00	231.67	N	N
2	MAINLINE	2	1400+00	1405+00	500	60.90	66.50	68.33	0.00	N	N
2	MAINLINE	2	1405+00	1410+00	500	62.50	43.70	41.67	250.00	N	N
3	MAINLINE	2	1410+00	1415+00	500	74.70	60.90	0.00	68.33	N	N
3	MAINLINE	2	1415+00	1420+00	500	51.40	50.80	226.67	236.67	N	N

In Conclusion

- Regardless of how well everything is thought out and how well everyone is prepared, there will always be questions and challenges to deal with.
- We have found that the inertial profiler is a very useful tool in identifying problems in design features and construction practices which is the first step in learning how to correct them.
- Designers and contractors need to work together to design and build smoother and safer roads that last longer and help to improve the fuel efficiency of the vehicles that travel them.

The END of the Profilograph

- Say goodbye to PI and hello to IRI