

AASHTO Crack Protocol

Brian Michalk, Texas DOT
RPUG 2006
Des Moines, Iowa

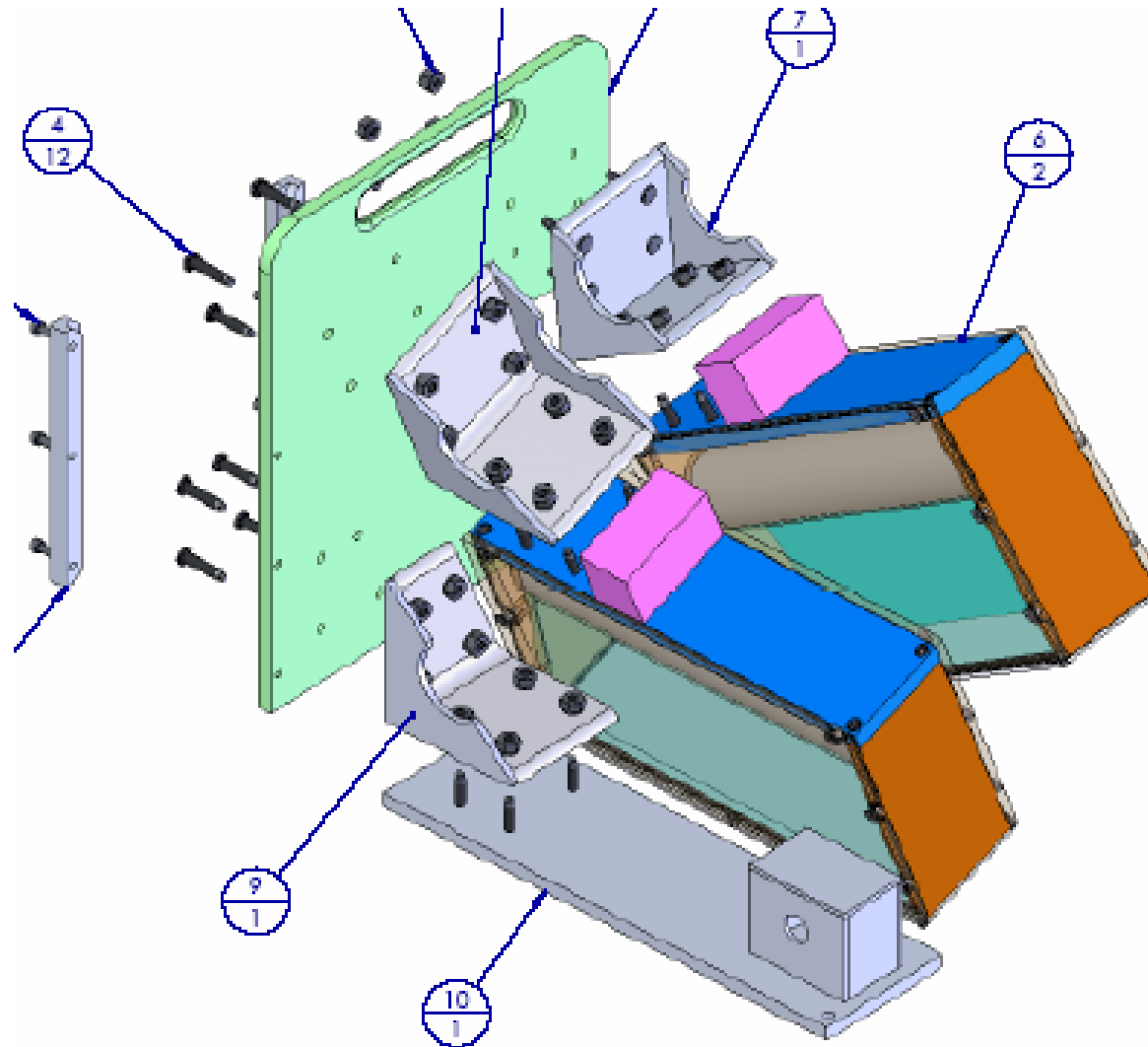
Overview

- TxDOT data collection infrastructure
- Overview of crackpanel
- Overview of crack steering committee
- Overview of system
 - Show web interface
 - Discuss infrastructure, uploads, data requests
 - amount of data and management
 - Discuss hardware
- Industry needs
 - Standardized and extensible reporting protocols
 - Online data format verification
- Overview of pmis ratings
- Opinions on aashto crack
 - Does not necessarily correlate
 - Does it look reasonable?
 - Differences with txdot

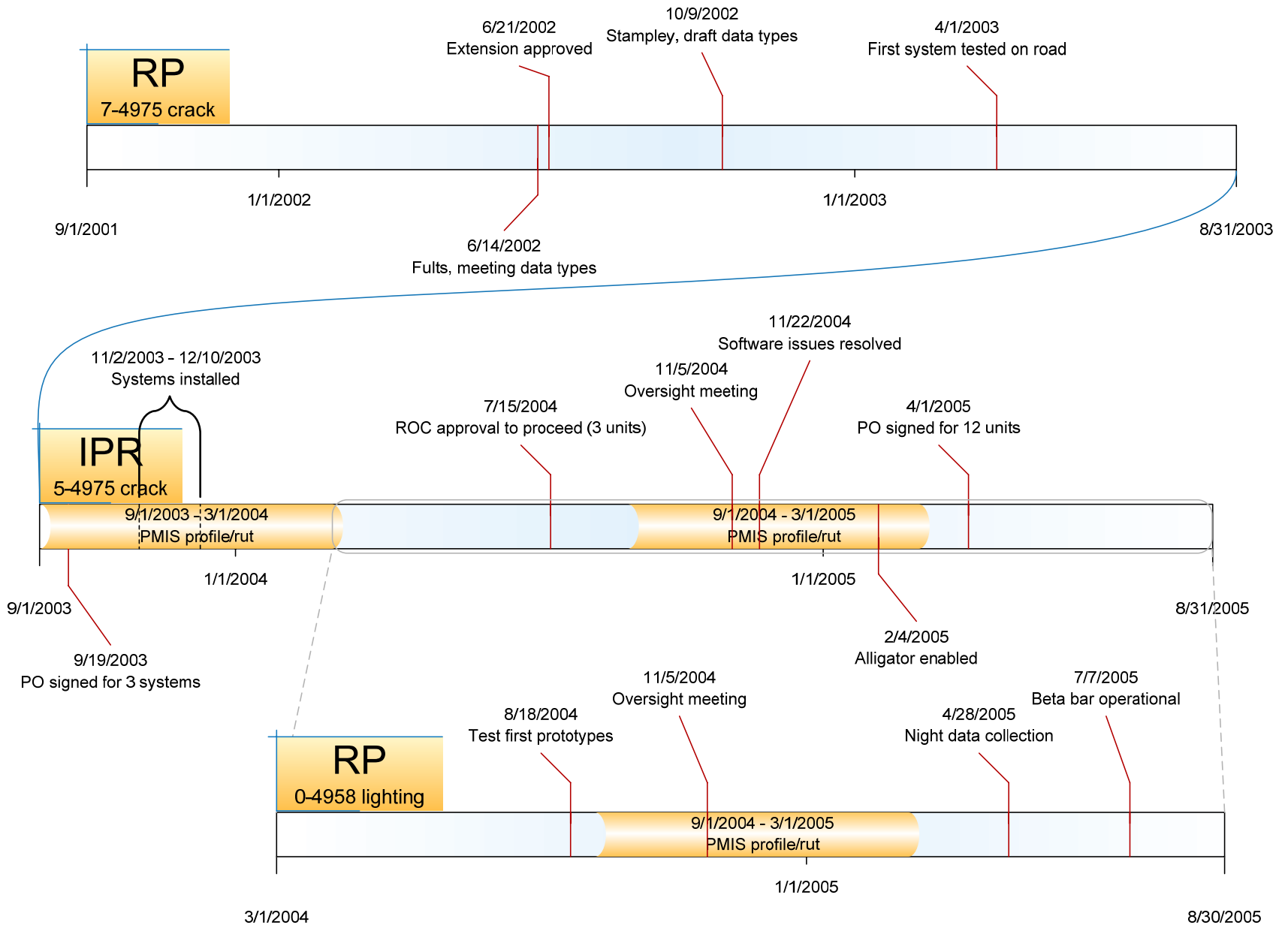
Night Images



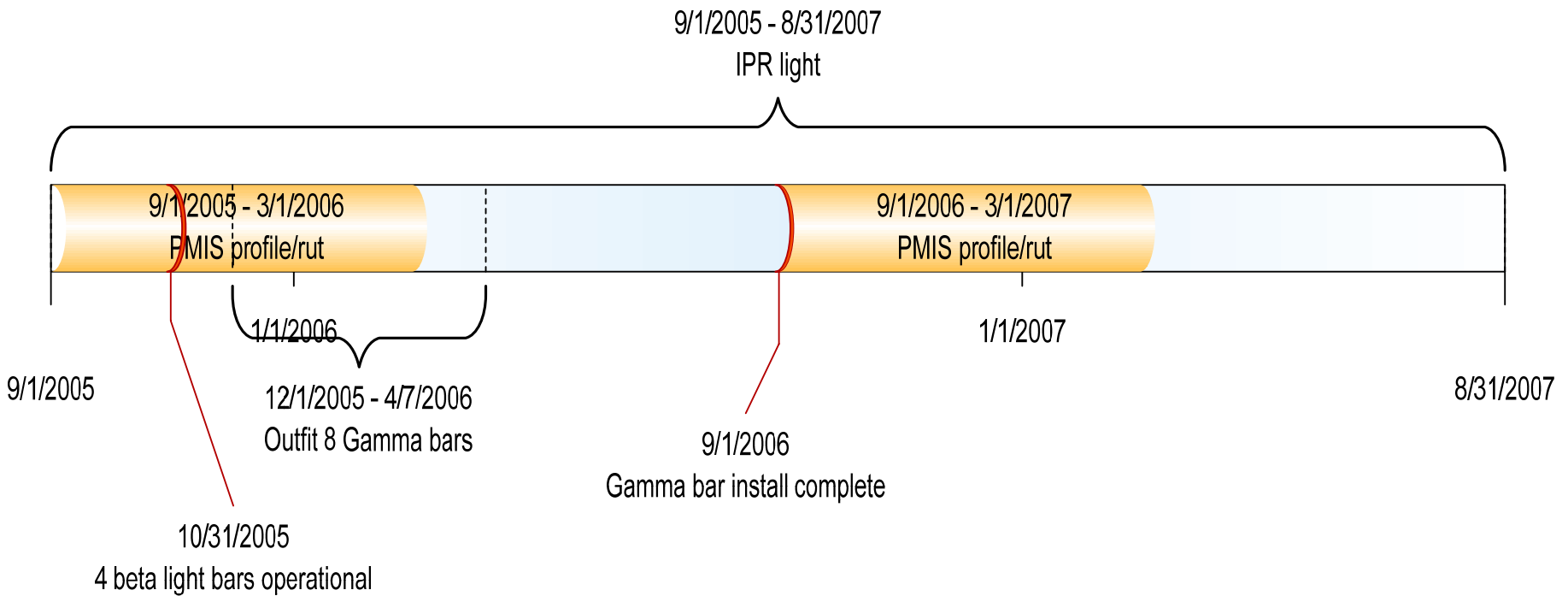
Gamma Light Bar Wing



Timeline to now



Planned Timeline



Infrastructure

- New Gadgets
 - Automated data transfer/PMIS import
 - Immediate access to uploaded data
 - Hourly statewide collection status map
 - Image Browser
 - Uploaded data status
- Industry needs
 - Unified reporting protocols
 - Web based tools to verify data formats

District Network Access Points



Map Status

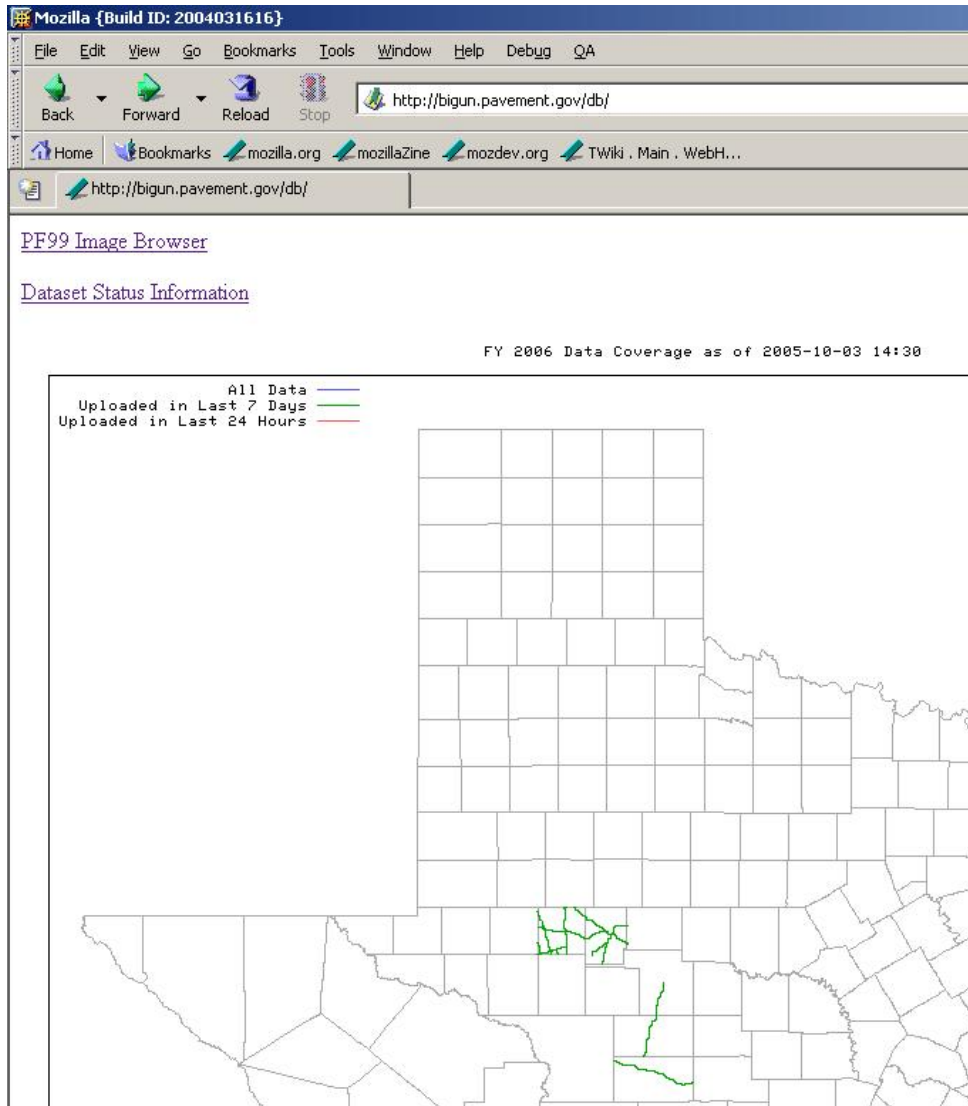


Image Browser

Back Forward Reload Stop http://bigun.pavement.gov/00/image_browse_frame.html


Home Bookmarks mozilla.org mozillaZine mozdev.org TWiki . Main . WebH...

http://bigun.paveme...e_browse_frame.html Google Maps

Select District: Select County: Select Roadway: I

[0406SE 405.6000](#) [0406SE 405.9007](#) [0406SE 406.0003](#) [0406SE 406.1025](#) [0406SE 406.2044](#) [0406SE 406.3000](#)
[0406+004K1 0.2091](#) [0406+004K1 0.3082](#) [0406+004K1 0.4075](#) [0406+004K1 0.5057](#) [0406+004K1 0.6091](#)
[0406+004K1 1.0065](#) [0406+004K1 1.1064](#) [0406+004K1 1.2065](#) [0406+004K1 1.3000](#) [0406+004K1 1.4000](#)
[0406+004K1 1.8000](#) [0406+004K1 1.9060](#) [0406+004K1 2.0000](#) [0406+004K1 2.1000](#) [0406+004K1 2.2061](#)
[0406+004K1 2.6000](#) [0406+004K1 2.7081](#) [0406+004K1 2.8000](#) [0406+004K1 2.9091](#) [0406+004K1 3.0072](#)
[0406+004K1 3.4056](#) [0406+004K1 3.5000](#) [0406+004K1 3.6000](#) [0406+004K1 3.7042](#) [0406+004K1 3.8000](#)

TXDOT Brazos Cty BS0006R 0406 004K1 8.4043 K1



Same Location from Google



Data Report

Pavement Database Dataset Status Report - Mozilla {Build ID: 2004031616}

File Edit View Go Bookmarks Tools Window Help Debug QA

Back Forward Reload Stop http://bigun.pavement.gov/db/dataset_status.pl

Home Bookmarks mozilla.org mozillaZine mozdev.org TWiki Main WebH...

Pavement Database Dataset Status Report

Pavement Database Dataset Status Report

Select Date of Data Collection

9 26 2005

Select Vehicle ID

2903228G

Total Miles: 249.69

Dataset ID	Run Timestamp	Operator	Responsible	HdrType	Start Header	Length	Purpose	PVMT Status	PMIS Status
85788 [DL]	2005-09-26 12:59:34.241000	RAY DOUGLAS	RDOUGLA	VERF	07 226 SL1PFV3 0000 +00.000 R1	2.00	VER	Checked	
85789 [DL]	2005-09-26 13:06:27.069000	RAY DOUGLAS	RDOUGLA	VERF	07 226 SL1PFV3 0000 +00.000 R1	0.00	VER	Checked	
85790 [DL]	2005-09-26 13:06:51.398000	RAY DOUGLAS	RDOUGLA	VERF	07 226 SL1PFV3 0000 +00.000 R1	0.03	VER	Checked	
85791 [DL]	2005-09-26 14:05:10.663000	RAY DOUGLAS	RDOUGLA	PMIS	07 216 US0087 0436 +00.000 L1	32.11		Exported	STORED
85792 [DL]	2005-09-26 14:45:47.257000	RAY DOUGLAS	RDOUGLA	PMIS	07 088 US0087 0404 +00.000 K6	10.20		Exported	STORED
85793 [DL]	2005-09-26 15:11:45.601000	RAY DOUGLAS	RDOUGLA	PMIS	07 216 US0087 0412 +00.000 K1	24.01		Exported	STORED
85794 [DL]	2005-09-26 15:48:03.210000	RAY DOUGLAS	RDOUGLA	PMIS	07 216 SH0163 0442 -00.400 K1	20.05		Exported	STORED
85795 [DL]	2005-09-26 16:19:23.804000	RAY DOUGLAS	RDOUGLA	PMIS	07 216 RM2139 0350 +00.100 K6	0.03		Exported	NO DATA
85796 [DL]	2005-09-26 16:21:16.944000	RAY DOUGLAS	RDOUGLA	PMIS	07 216 RM2139 0338 -02.000 K1	12.73		Exported	STORED

TxDOT share (\\despav\VehicleDaily\)

Windows Explorer window showing the contents of the Samba share \\despav\VehicleDaily\2903228G\BA99.

Address: \\despav\VehicleDaily\2903228G\BA99

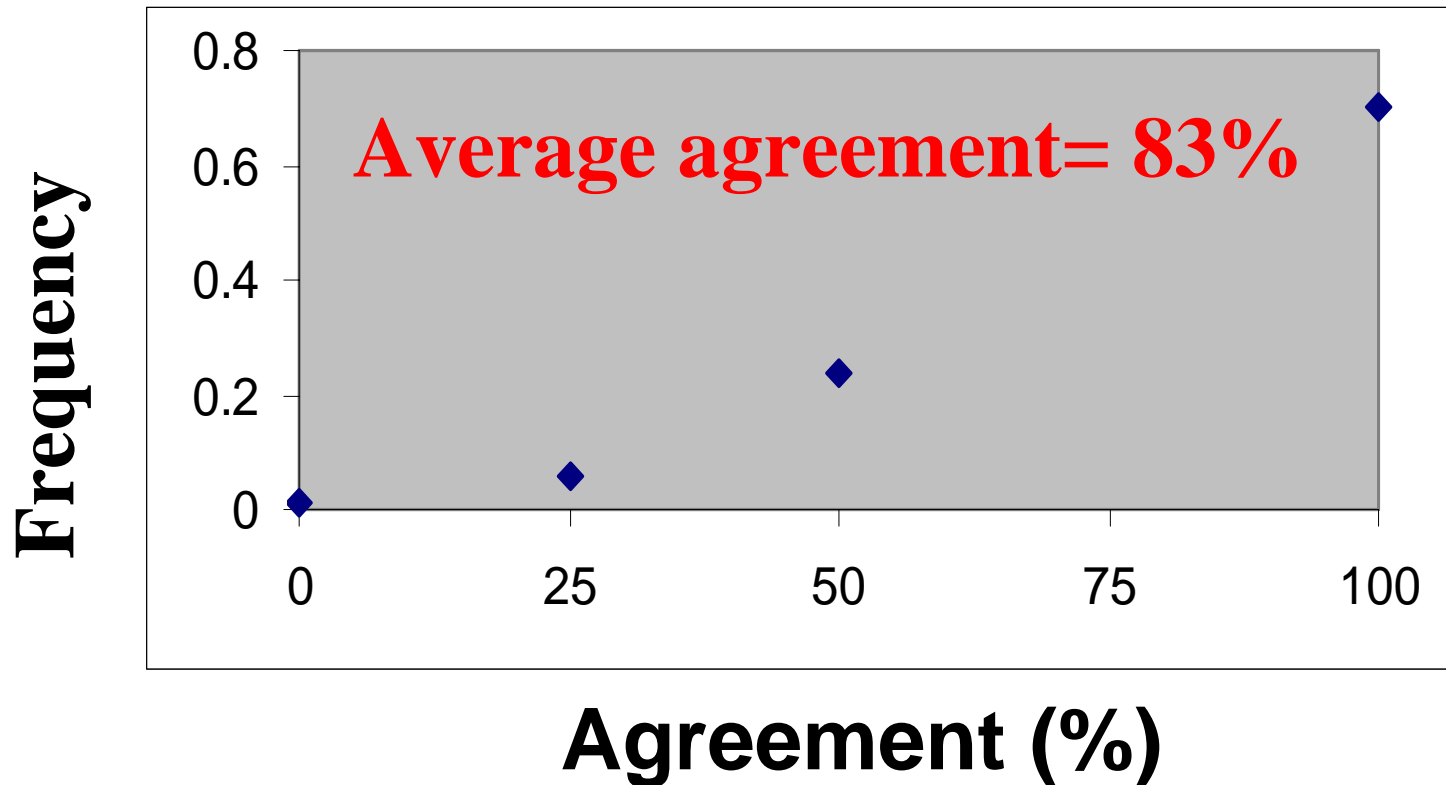
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2903228G_20050803.pf9	38 KB
2903228G_20050808.pf9	231 KB
2903228G_20050823.ba9	0 KB
2903228G_20050830.ba9	2,639 KB
2903228G_20050831.ba9	30,421 KB
2903228G_20050913.ba9	79,005 KB
2903228G_20050914.ba9	84,667 KB
2903228G_20050919.ba9	12,462 KB
2903228G_20050922.ba9	9,582 KB
2903228G_20050923.ba9	8,375 KB
2903228G_20050926.ba9	201,215 KB
2903228G_20050927.ba9	5,918 KB
2903228G_20050928.ba9	135,227 KB
2903228G_20050929.ba9	6,385 KB
2903228G_20051003.ba9	0 KB

Crack Panel, June 2002

- Various pavements
- 247 images with varying levels of distress.
- Five people, one second per image
- One person rated longitudinal cracked images four times over several days.
- The automated system ran five times in variable conditions

Repeatability of Longitudinal Visual Rating

100 images of a pavement were rated 4 times by the same person.



Person-Person Agreement

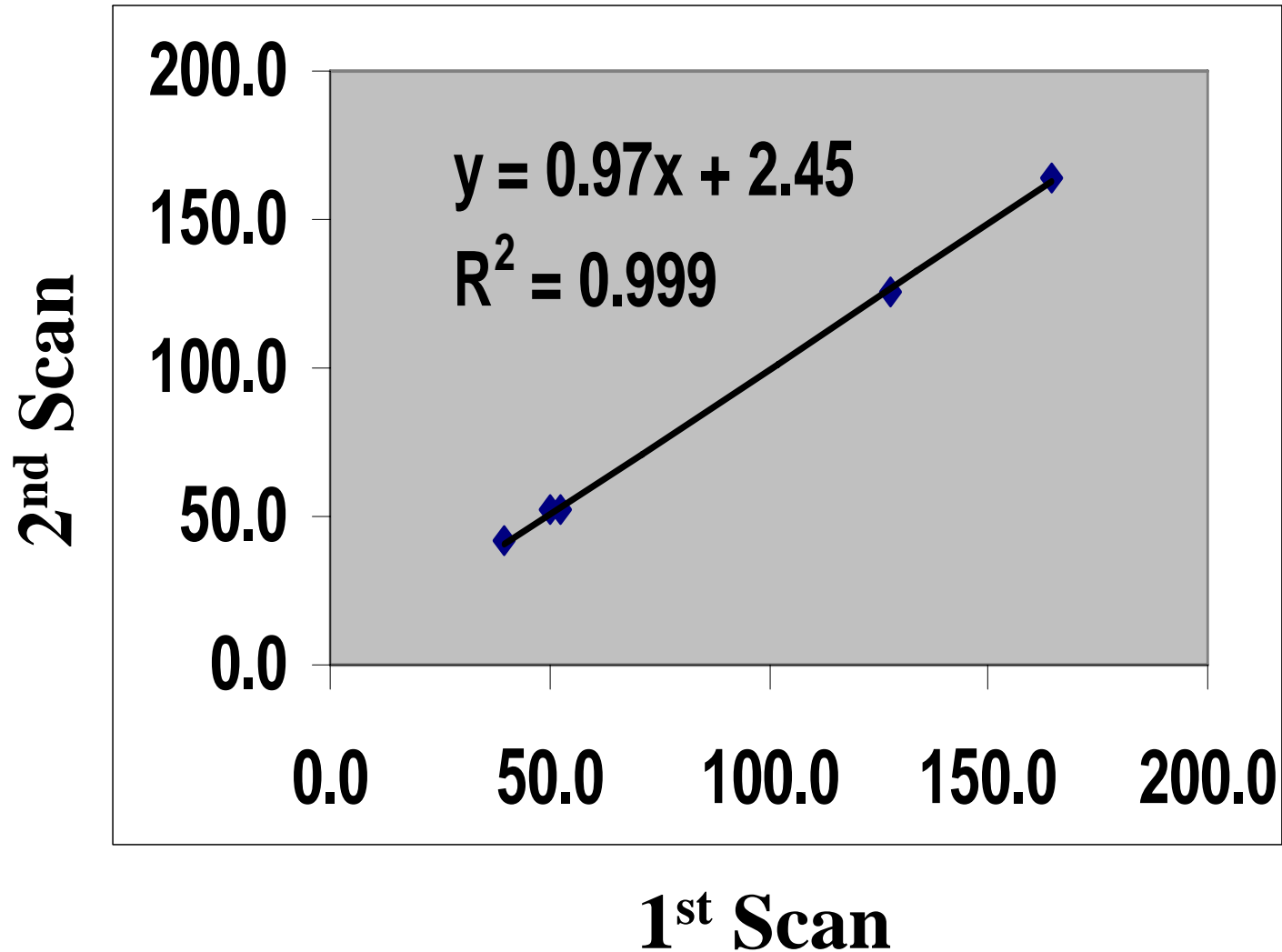
Longitudinal Crack Counts

Average agreement=74%.

	p1	p2	p3	p4	p5
p1		0.80	0.68	0.79	0.71
p2	0.80		0.72	0.74	0.71
p3	0.68	0.72		0.75	0.77
p4	0.79	0.74	0.75		0.75
p5	0.71	0.71	0.77	0.75	

*** 247 images of pavements were rated.**

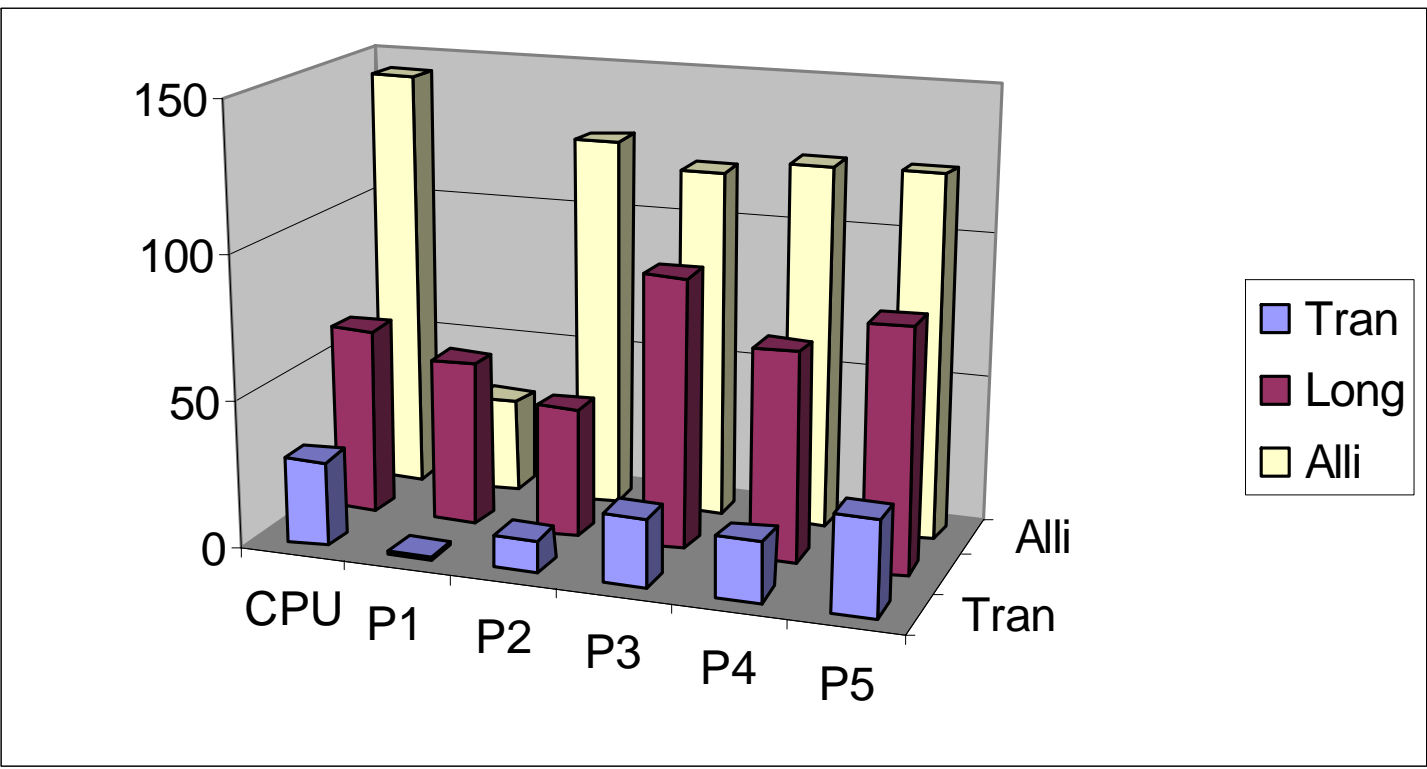
% Longitudinal Cracks



Brian K. Michalk: Notice that the computer gives answers within the range of the human panel.

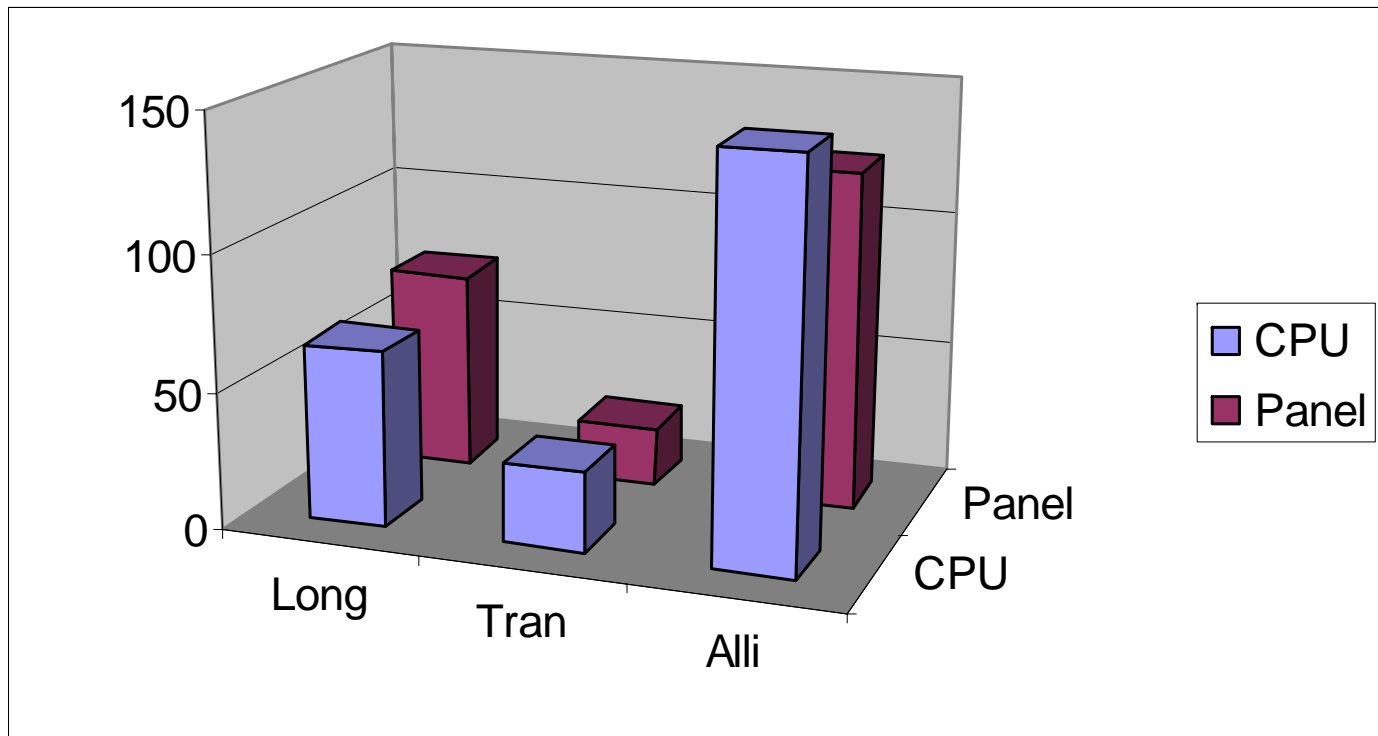
Crack Counts

Counts for 247 images of pavements.



Crack Counts

Panel is the average of 5 people's counts.

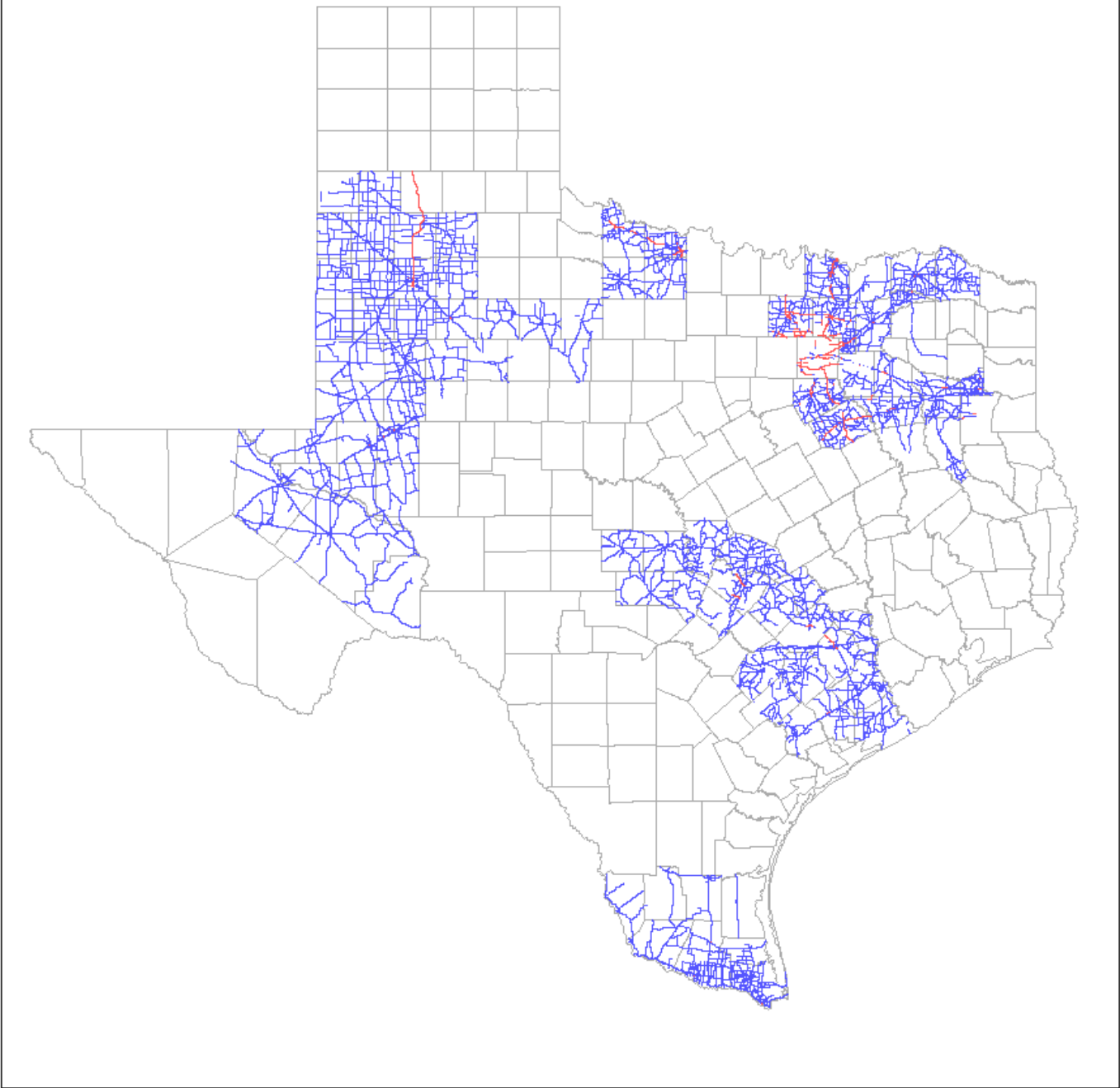


Comparison on Repeatability

	longitudinal	transverse	alligator
1 person, 4x	83	N/A	N/A
5 people, 1x	74	83	61
1 computer, 5x	90.2	92.5	90.4

*** Computer's repeatability is based on C.V. data;
People's repeatability is based on agreements.**

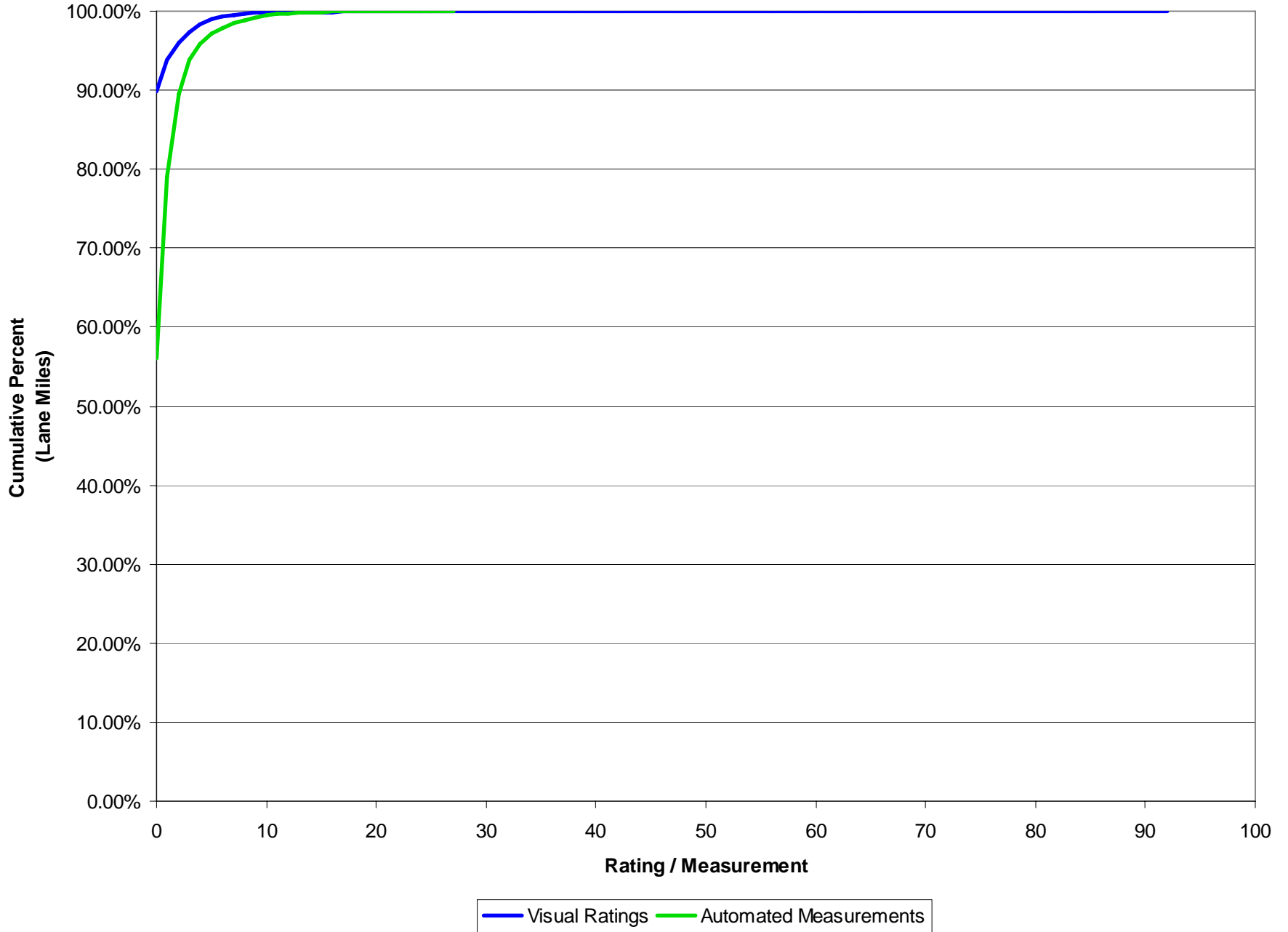
Flexible Data —
Rigid Data —



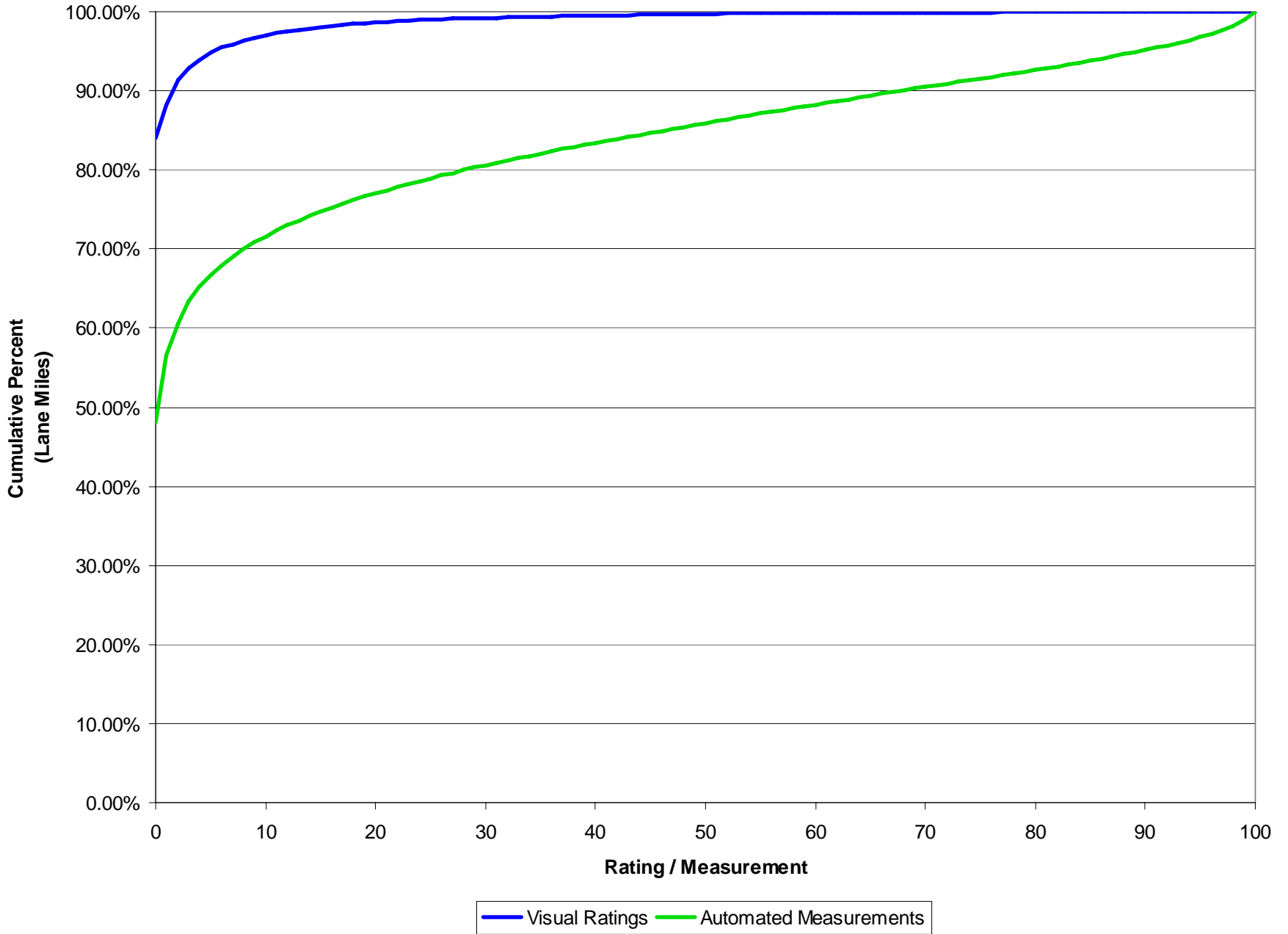
m1

3431 miles of flex
127 miles of rigid
michalk, 3/17/2006

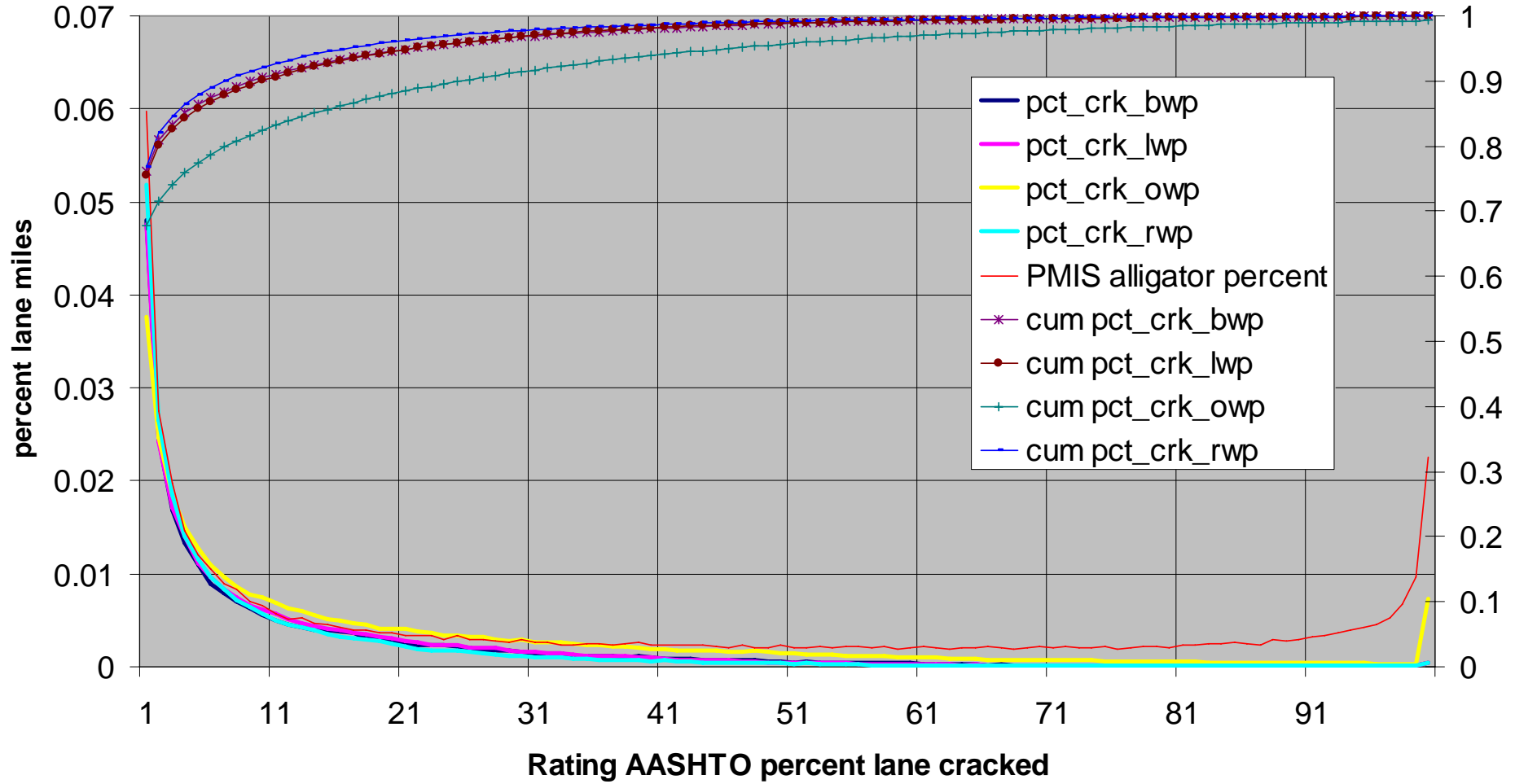
Fiscal Year 2006 ACP Transverse Cracking



Fiscal Year 2006 ACP Alligator Cracking



Flexible AASHTO %cracked



Select District:
 Select County:
 Select Roadway:
 Fiscal Year:

- All
- 2003
- 2004
- 2005
- 2006**
- 2007

and 4183 Images.

3+003	0.0003	0163+003	0.0004	0163+003	0.0037	0163+003	0.0062	0163+003	0.0078	0163+003	0.0121	0163+003	0.0131	0163+003	0.0131	0163+003	0.0131
3+003	0.0536	0163+003	0.0561	0163+003	0.0621	0163+003	0.0647	0163+003	0.0770	0163+003	0.1037	0163+003	0.1042	0163+003	0.1042	0163+003	0.1042
3+003	0.1161	0163+003	0.1540	0163+003	0.1568	0163+003	0.1570	0163+003	0.1601	0163+003	0.1649	0163+003	0.2072	0163+003	0.2072	0163+003	0.2072
3+003	0.2107	0163+003	0.2162	0163+003	0.2204	0163+003	0.2607	0163+003	0.2609	0163+003	0.2609	0163+003	0.2634	0163+003	0.2689	0163+003	0.2689
3+003	0.3122	0163+003	0.3122	0163+003	0.3146	0163+003	0.3203	0163+003	0.3244	0163+003	0.3645	0163+003	0.3649	0163+003	0.3649	0163+003	0.3649

15IH002001 64 00.500X1



Image ID: 4760776 - View: FROW
 Dataset ID: [102542](#) - Line: 91731
 RefMark: 08 115 0163+003 - Offset: 0.0003
 GPS Location: [32.1693100,-101.6813990](#)
 Heading: 246 - Altitude: 727.850 - GPSID: 21738628
 Collection Time: 2006-04-03 15:39:34
[Download Raw Profile Data](#)

Low Standard Deviation

08115IH002001 81 00.000R1



Image ID: 4758348 - View: FROW
Dataset ID: [102535](#) - Line: 35975
RefMark: 08 115 0181+000 - Offset: 0.1568
GPS Location: [32.2640783,-101.4333639](#)
Heading: 75 - Altitude: 710.680 - GPSID: 21731:
Collection Time: 2006-04-03 13:35:50
[Download Raw Profile Data](#)

High Standard Deviation

08115IH00200196 00.000R1



Image ID: 4758677 - View: FROW

Dataset ID: [102535](#) - Line: 42927

RefMark: 08 115 0196+000 - Offset: 0.1041

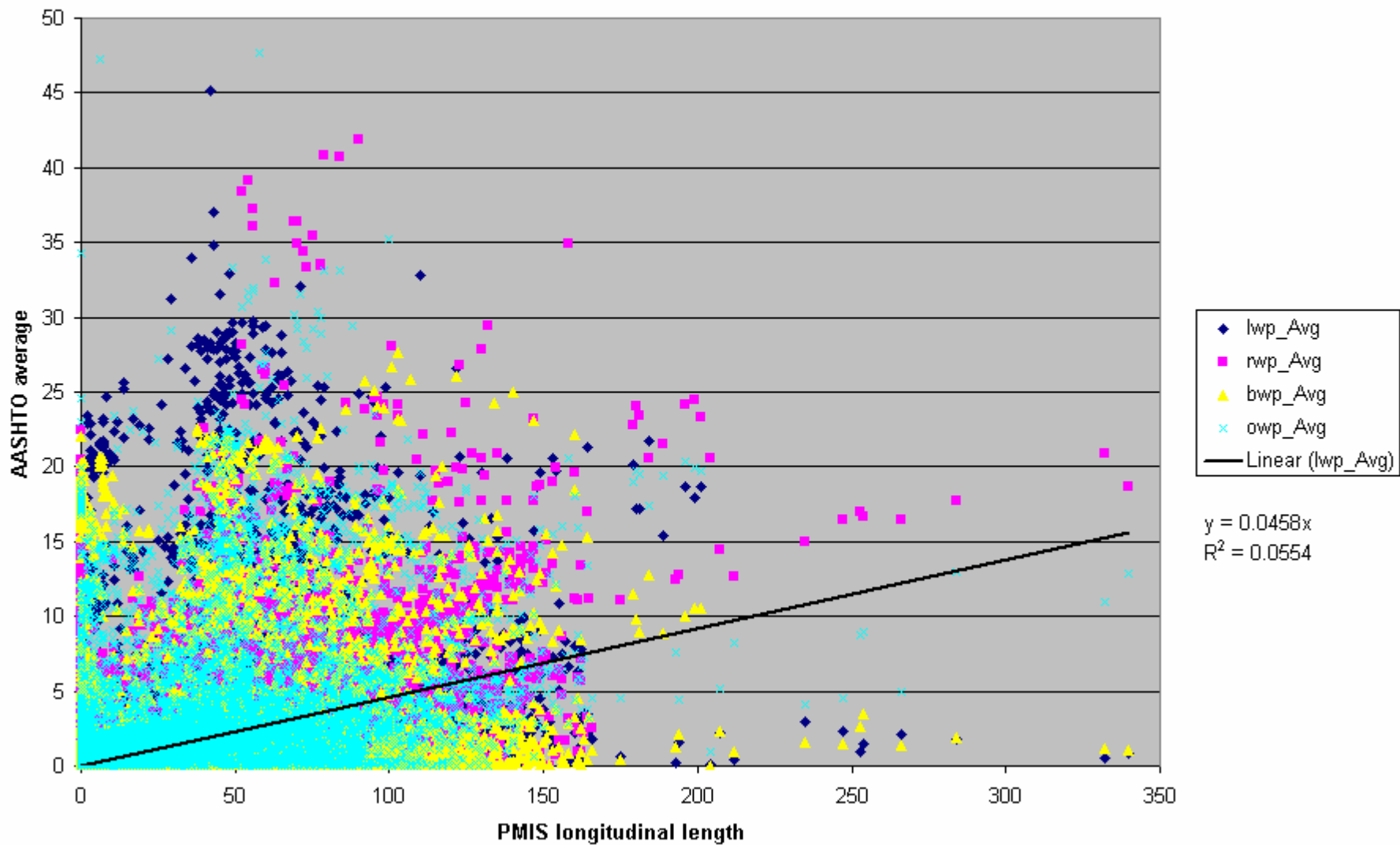
GPS Location: [32.3254673,-101.1924844](#)

Heading: 88 - Altitude: 659.690 - GPSID: 2173

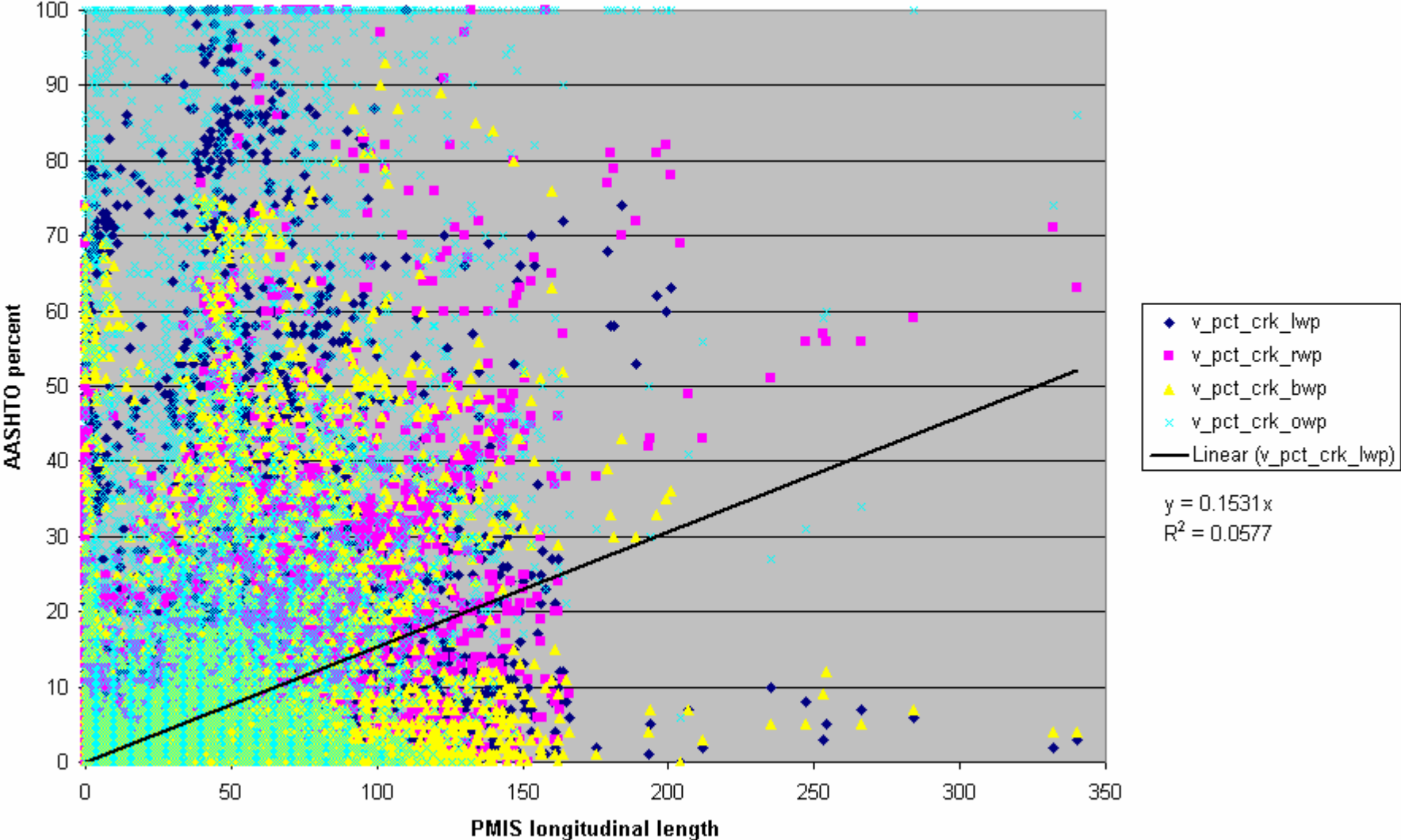
Collection Time: 2006-04-03 13:35:50

[Download Raw Profile Data](#)

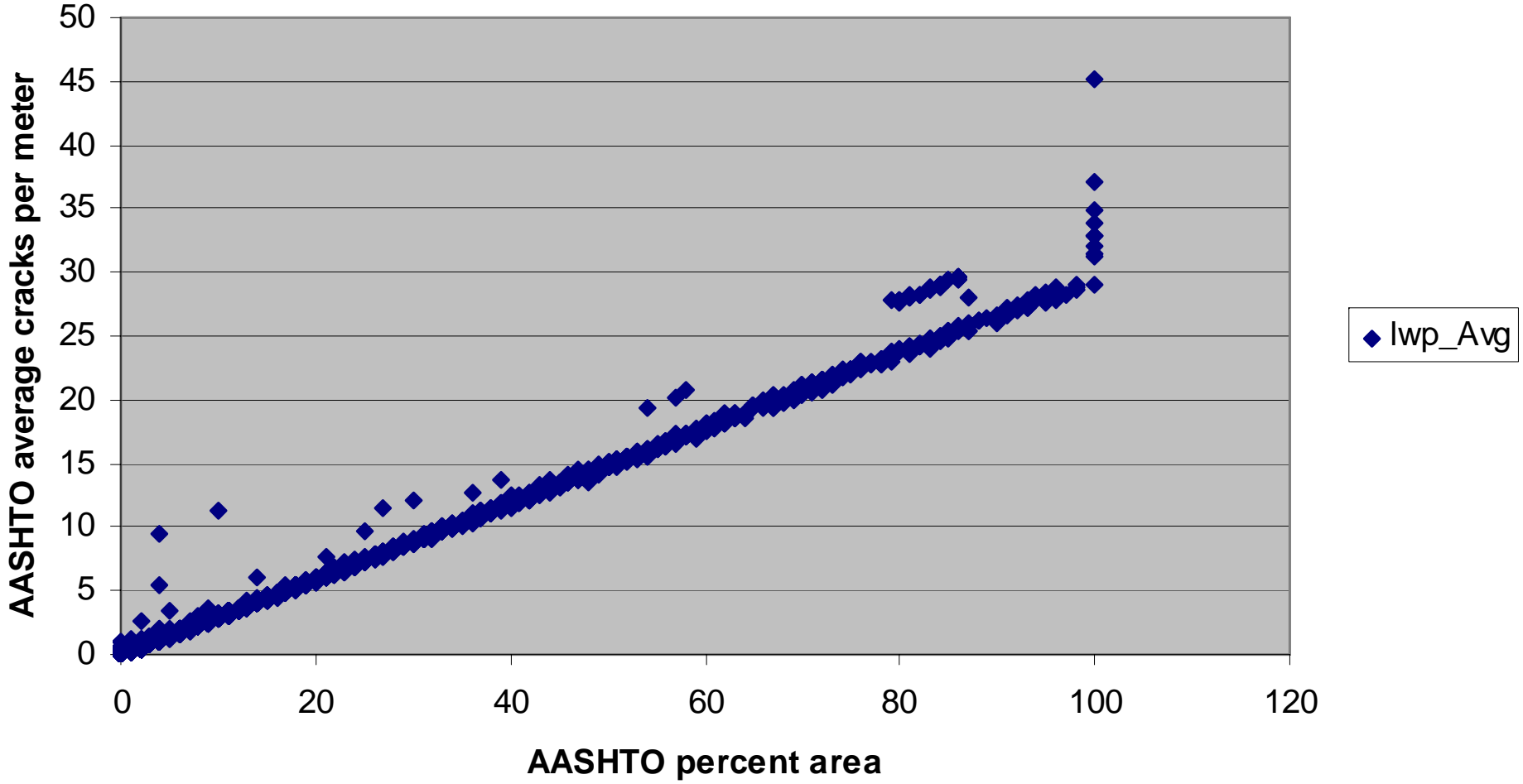
Longitudinal vs Average



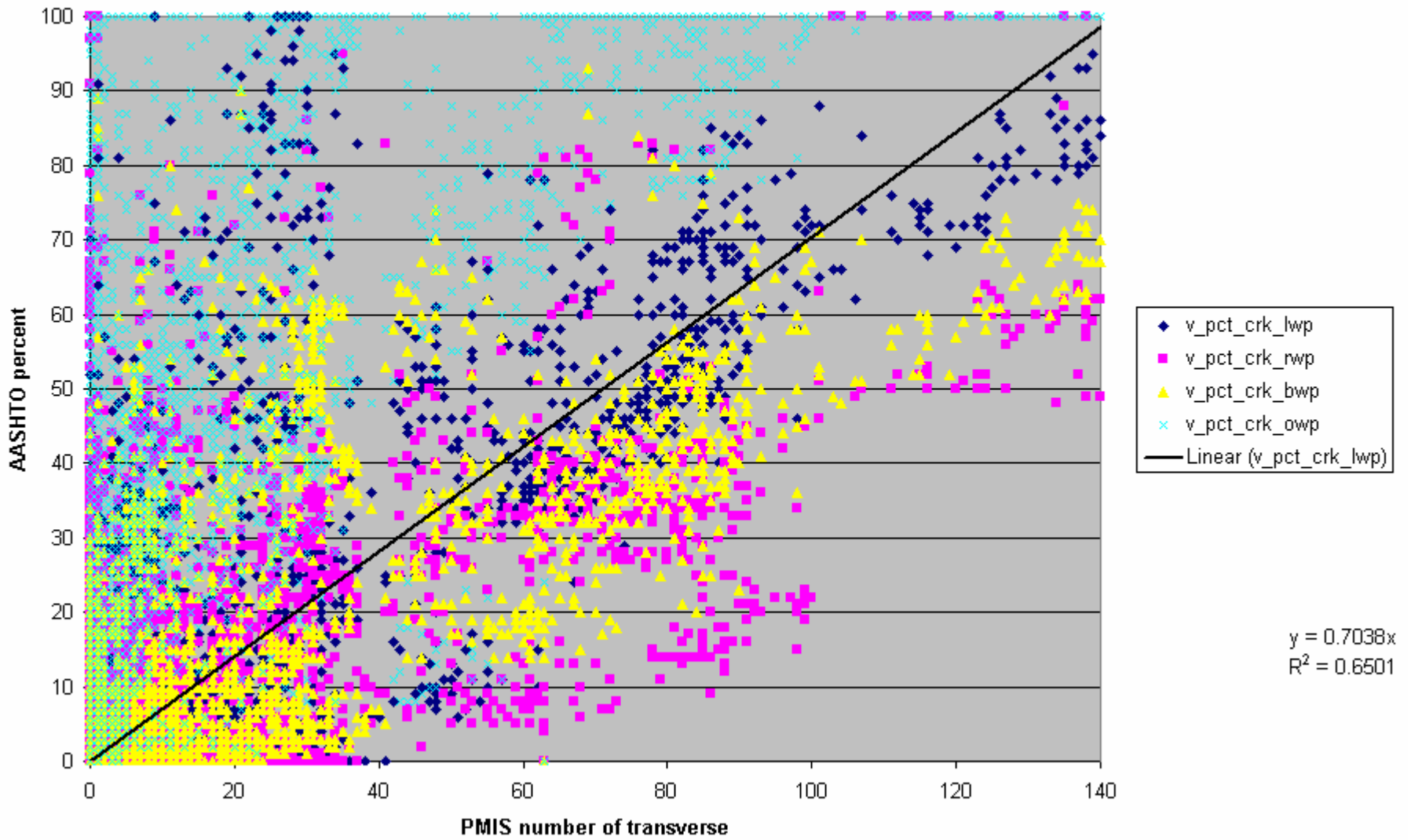
Longitudinal vs Percent



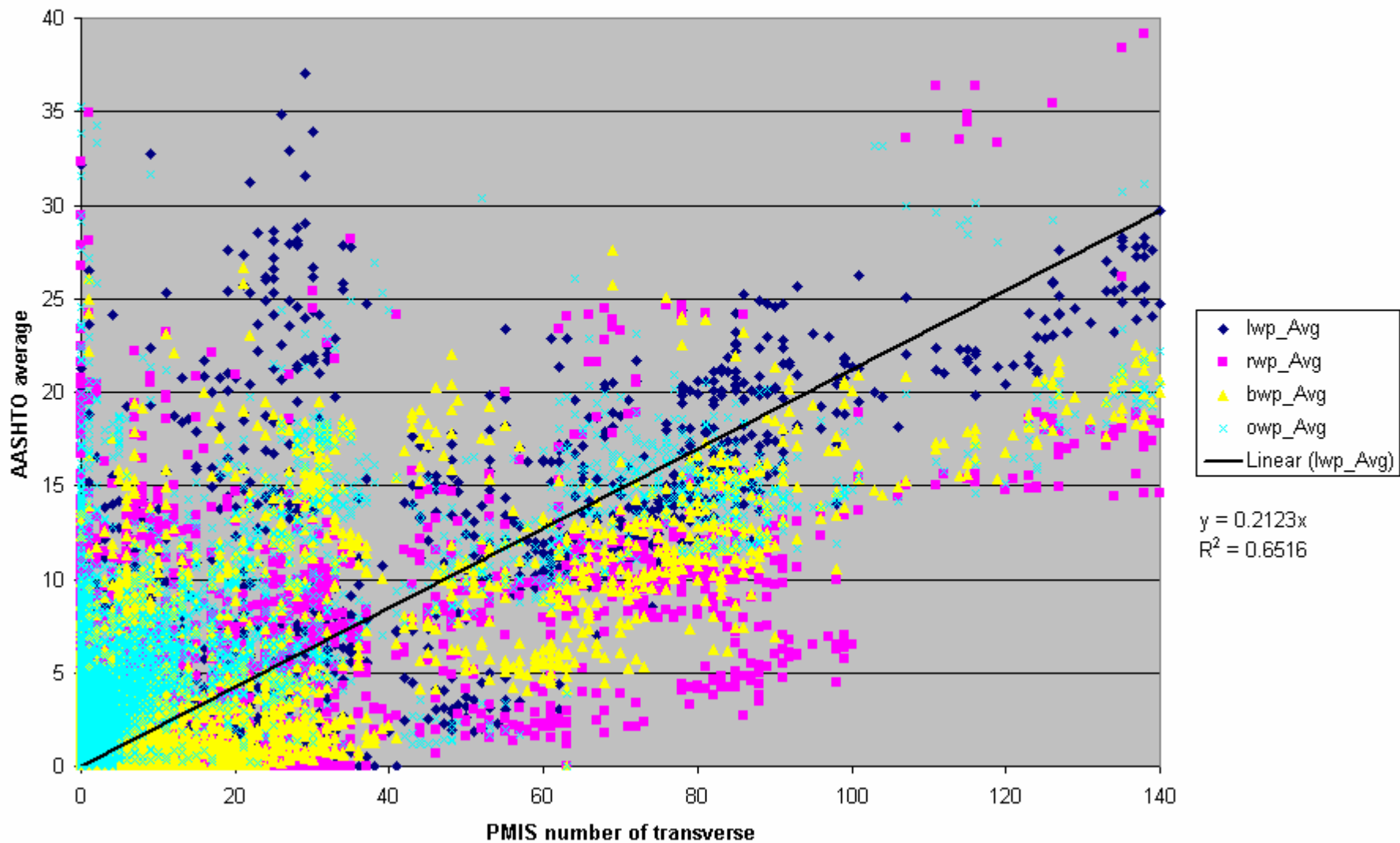
AASHTO % vs Average



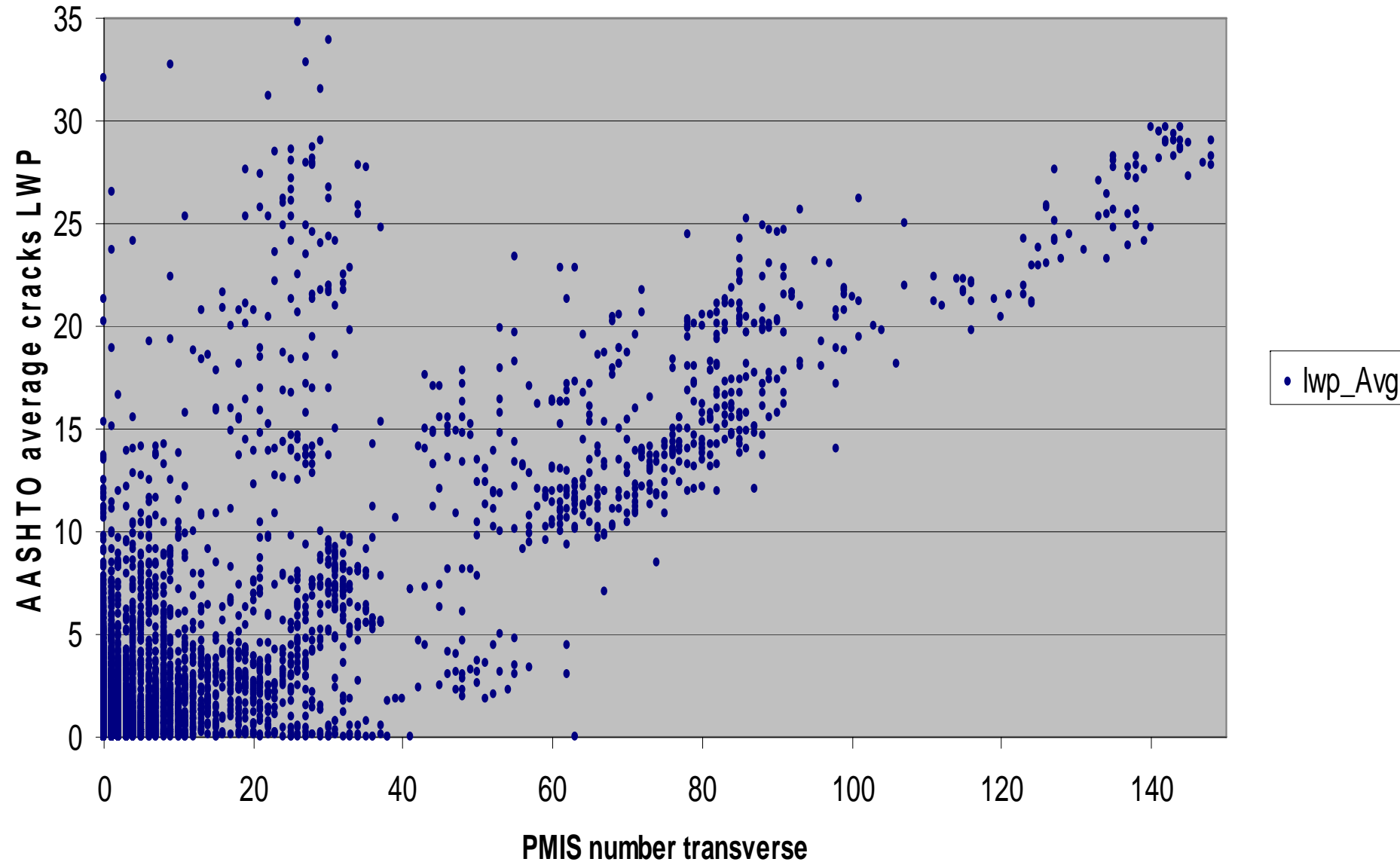
Transverse vs Percent



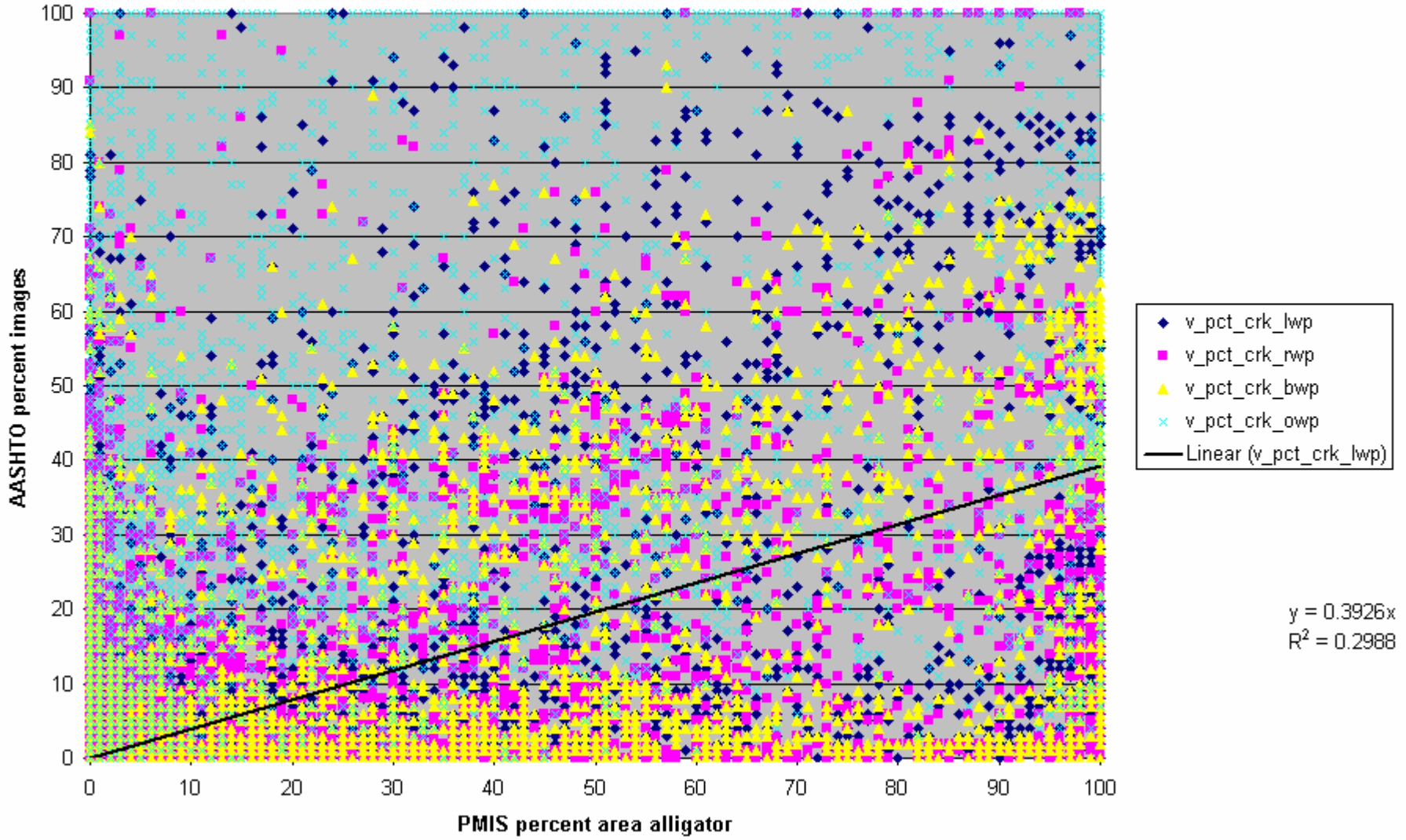
Transverse vs Average



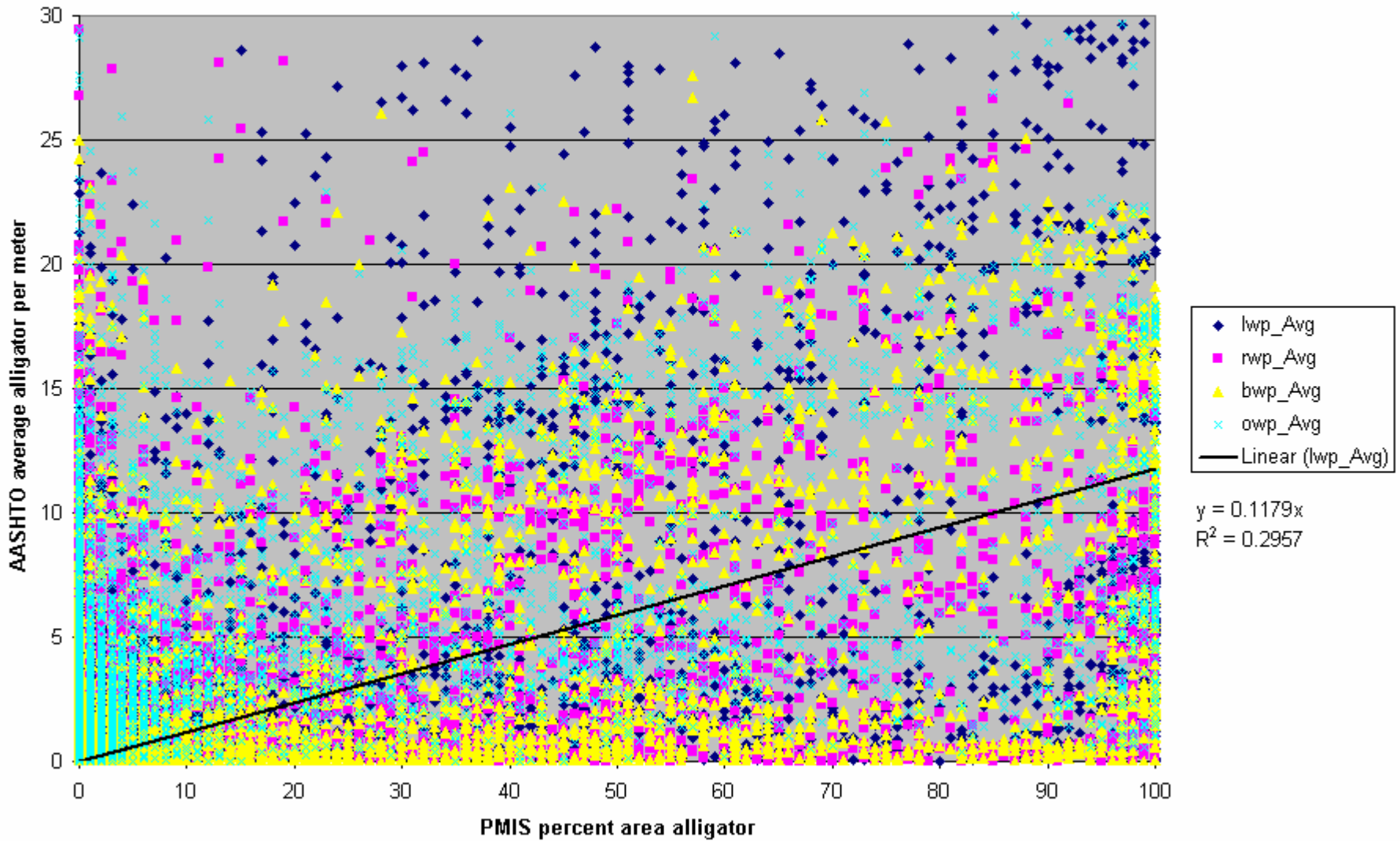
Transverse vs LWP average



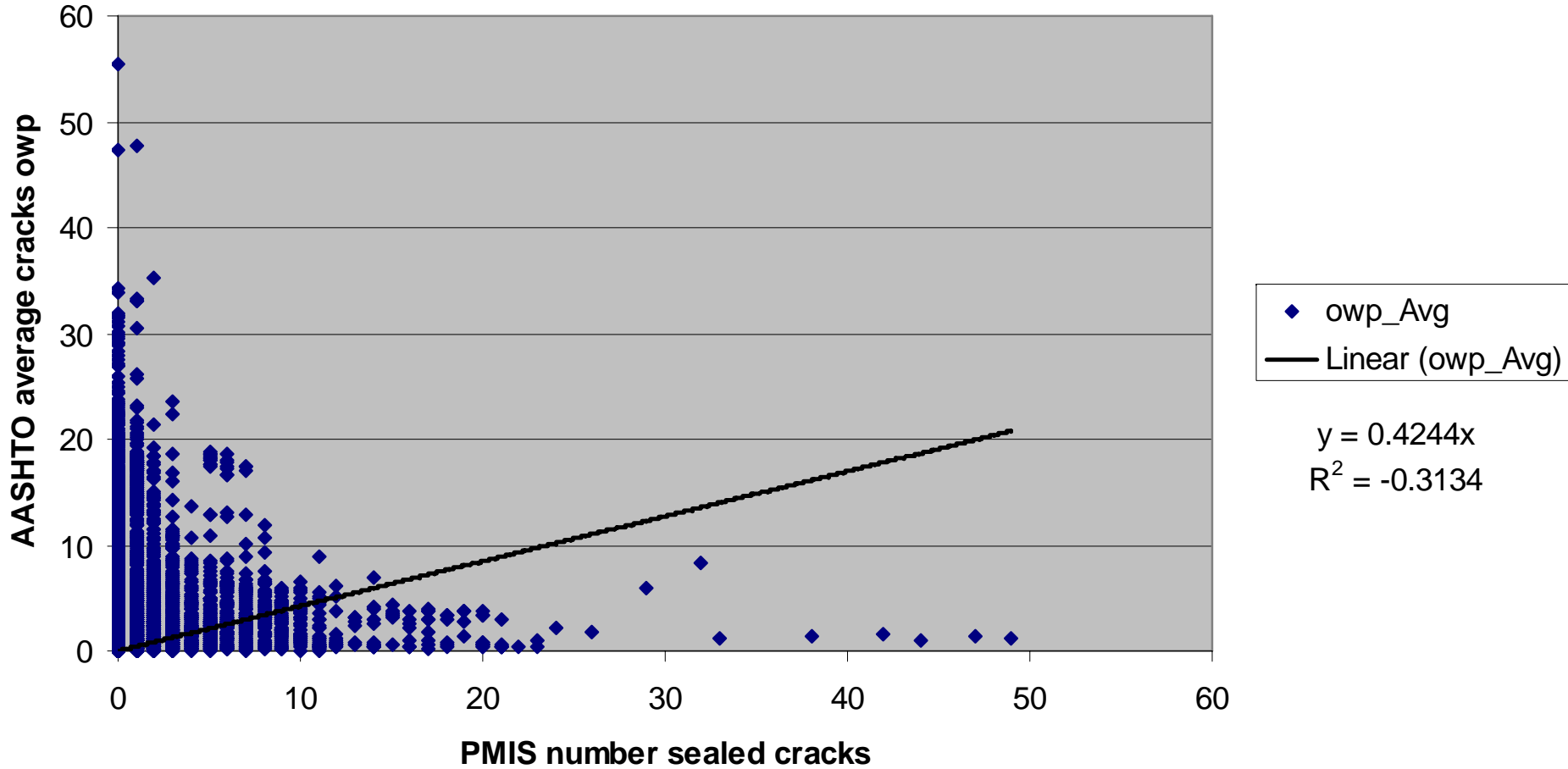
Alligator vs Percent



Alligator vs Average



Transverse Sealed vs Outside Wheelpath



AASHTO Crack Observations

- Need to pay attention to averages per unit area to compare state to state
- When reporting must qualify
 - Area of image
 - Apparent system resolution
- AASHTO
 - 1mm minimum width
 - 25mm minimum length
- Not reporting severity
- Should separate “outside of wheelpath” into left and right.