The challenges of overhauling the old data collected with old technology with data collected with new technology. How to transition from new data collection technology/methods and correlate it with old condition data.

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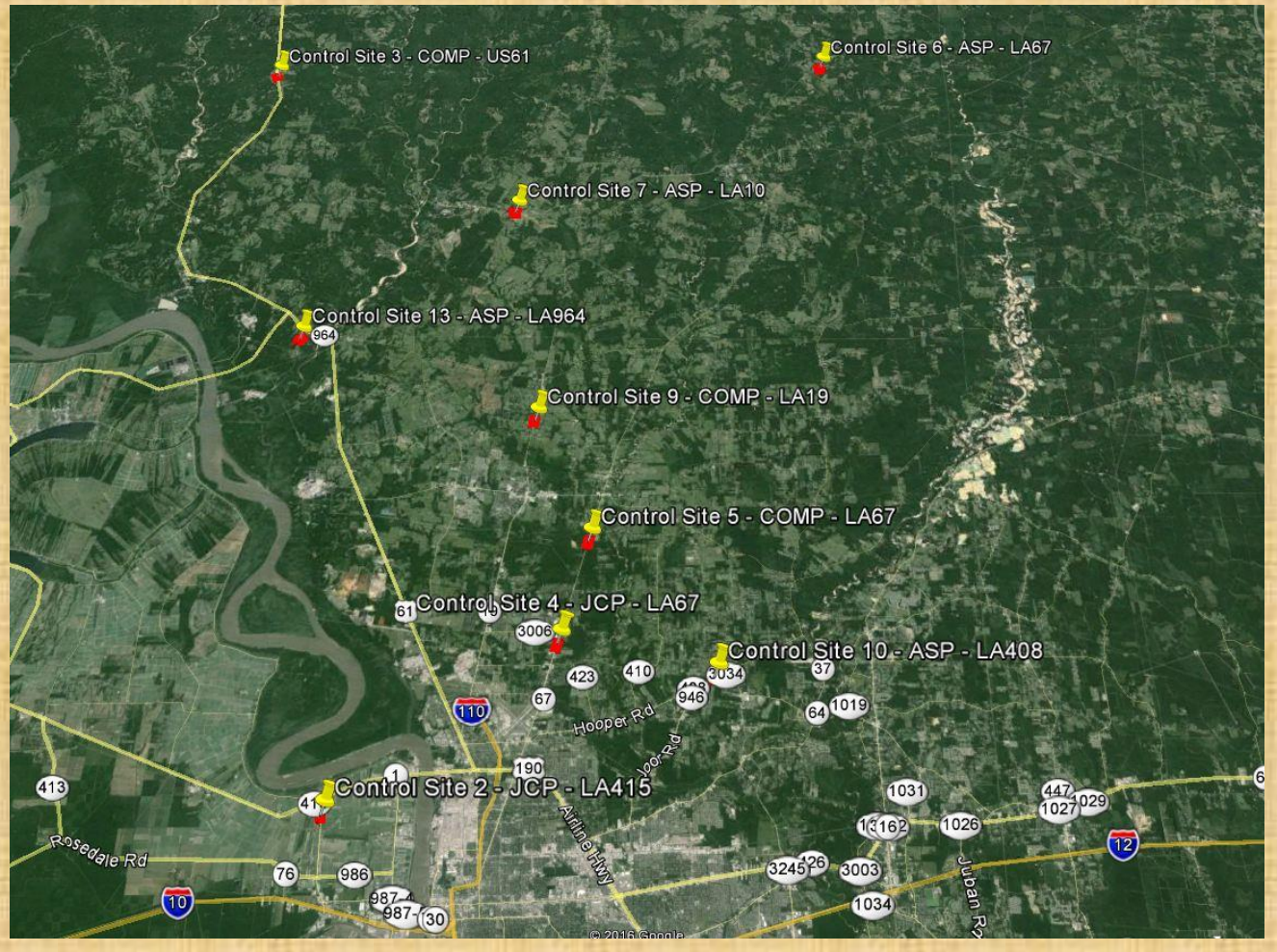
2D - 3D Comparison

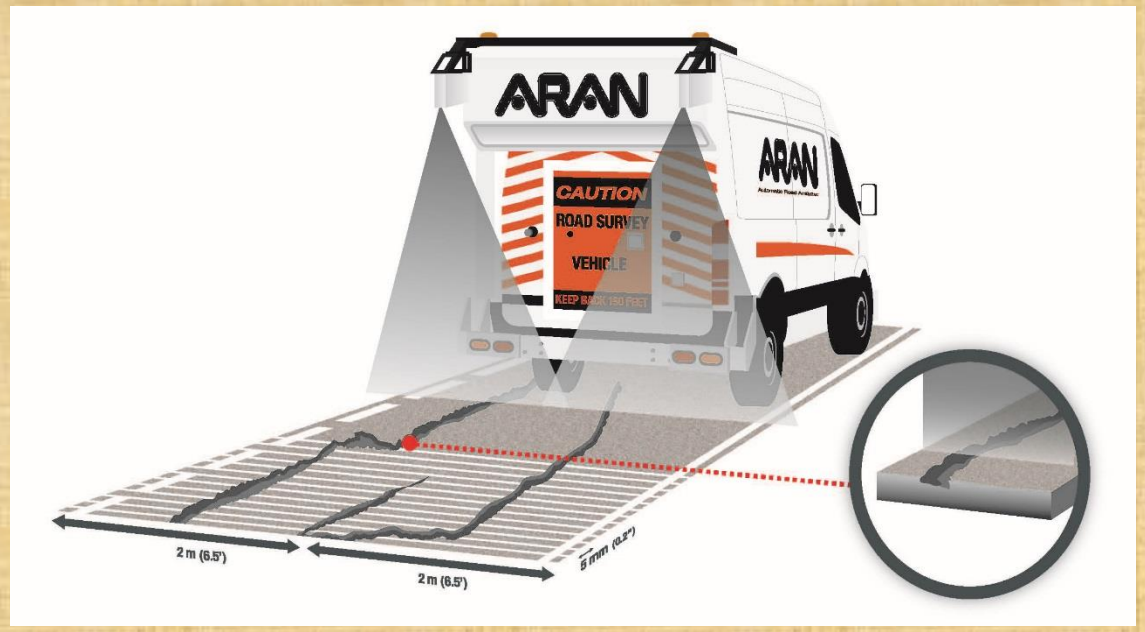
Overall Comparison Testing

- 9 sites collected for a total of 4.5 miles (0.5 mile each)
- 2D and 3D vehicles collected the same sites
- Asphalt (4 sites), Composite (3 sites), JCP (2 sites)



Pave3D System Overview

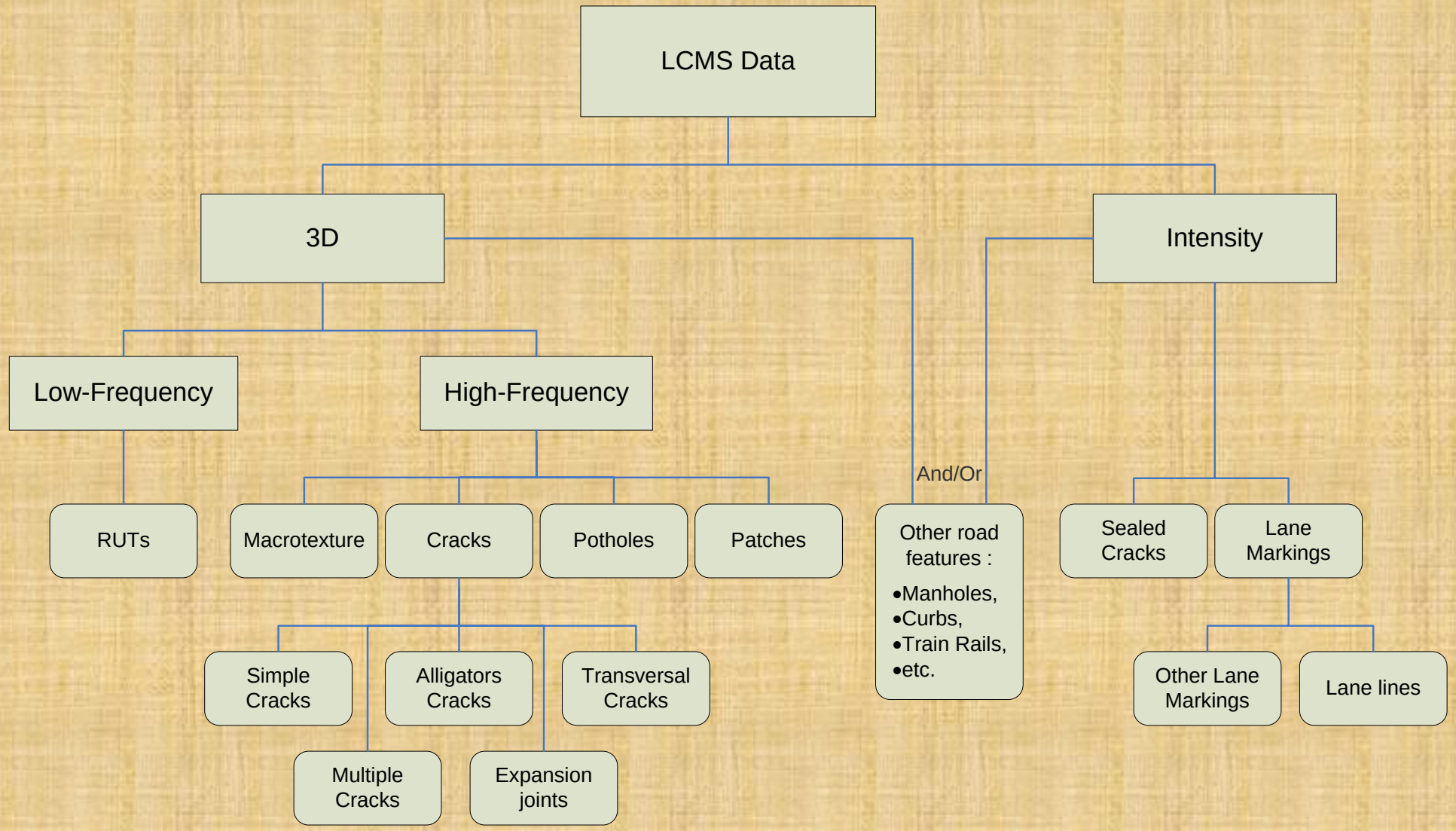
- 3D imaging
  - Range
  - Intensity
- Measures >2mm cracks



Acquisition Rate	5,600 profiles/s
Longitudinal Resolution	0.2“ (5mm)
Range (Depth) Accuracy	0.02” (0.5mm)
Transverse Resolution	0.04” (1mm)
Transverse Width	13.5ft (4.1m)

Pave3D (LCMS) Data

Laser **C**racking **M**easuring **S**ystem

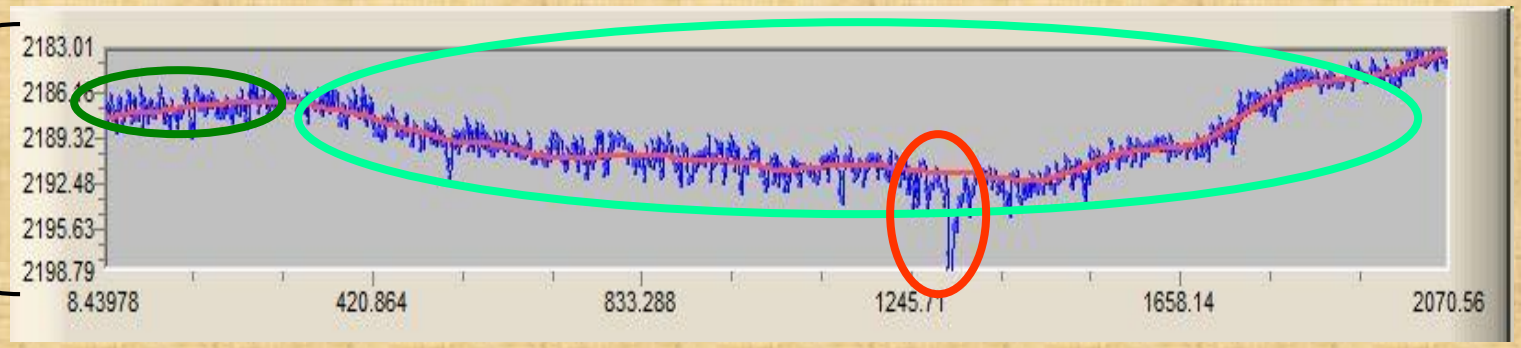


Profile Data

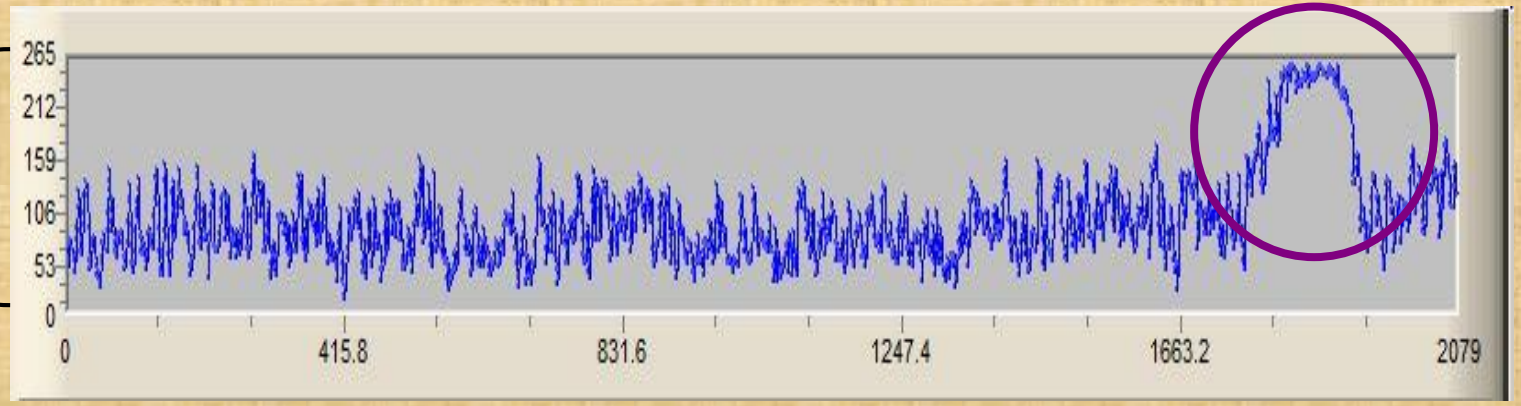
Macro-texture

Rut

Distance between Sensor and ground (in mm)



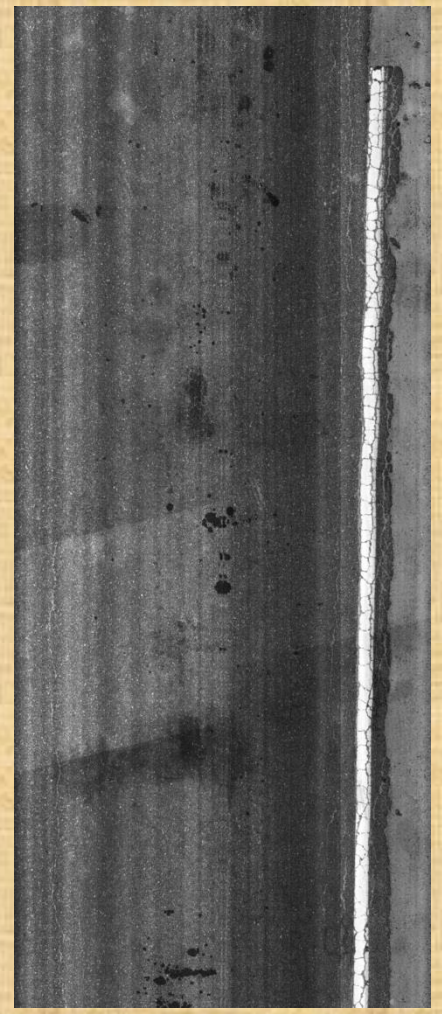
Laser intensity (black = 0, white = 255)



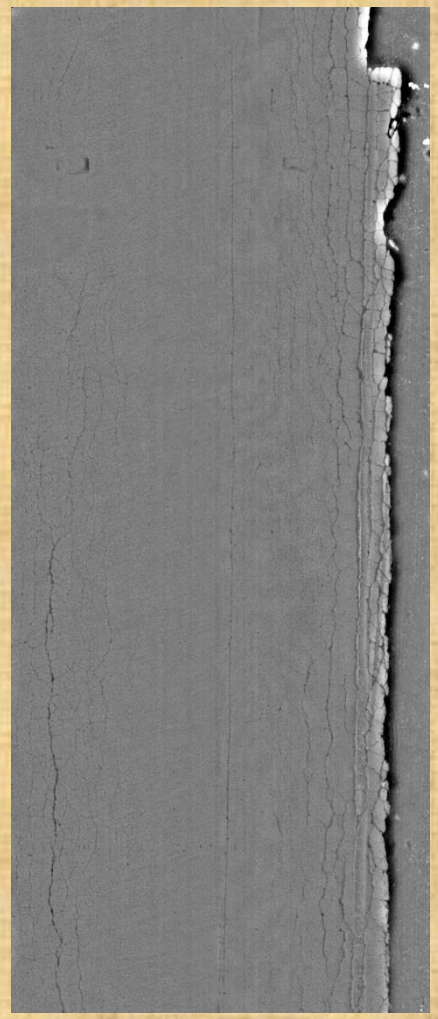
Right Lane Marking

Pave3D Image Output

Intensity



Range



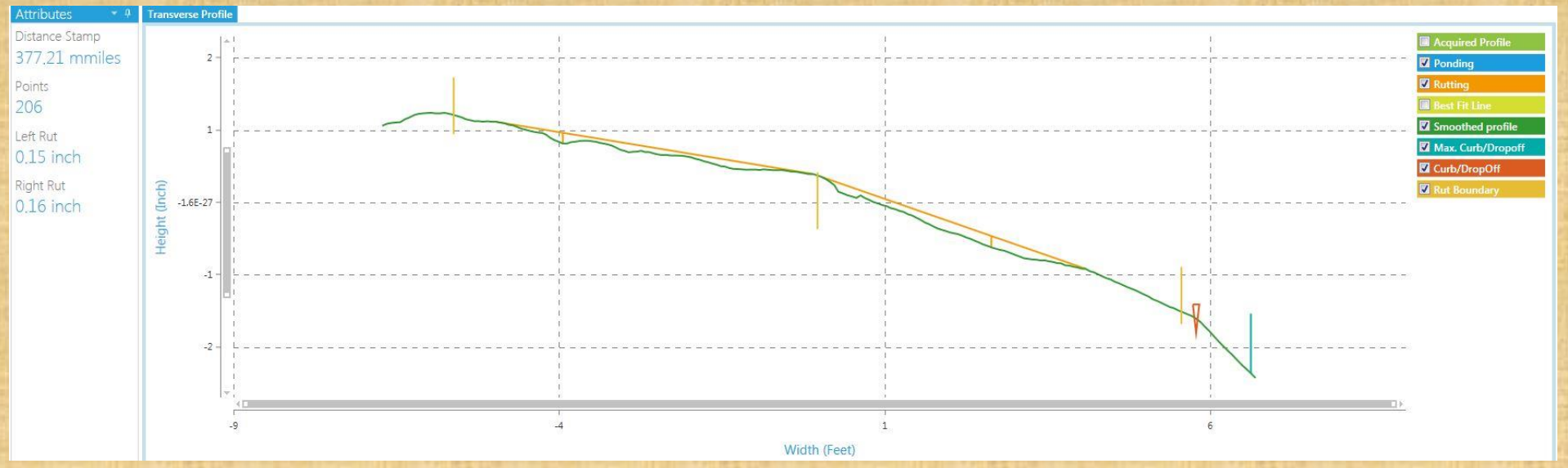
3D

Range + Intensity = 3D

Transverse Profile (Rutting)

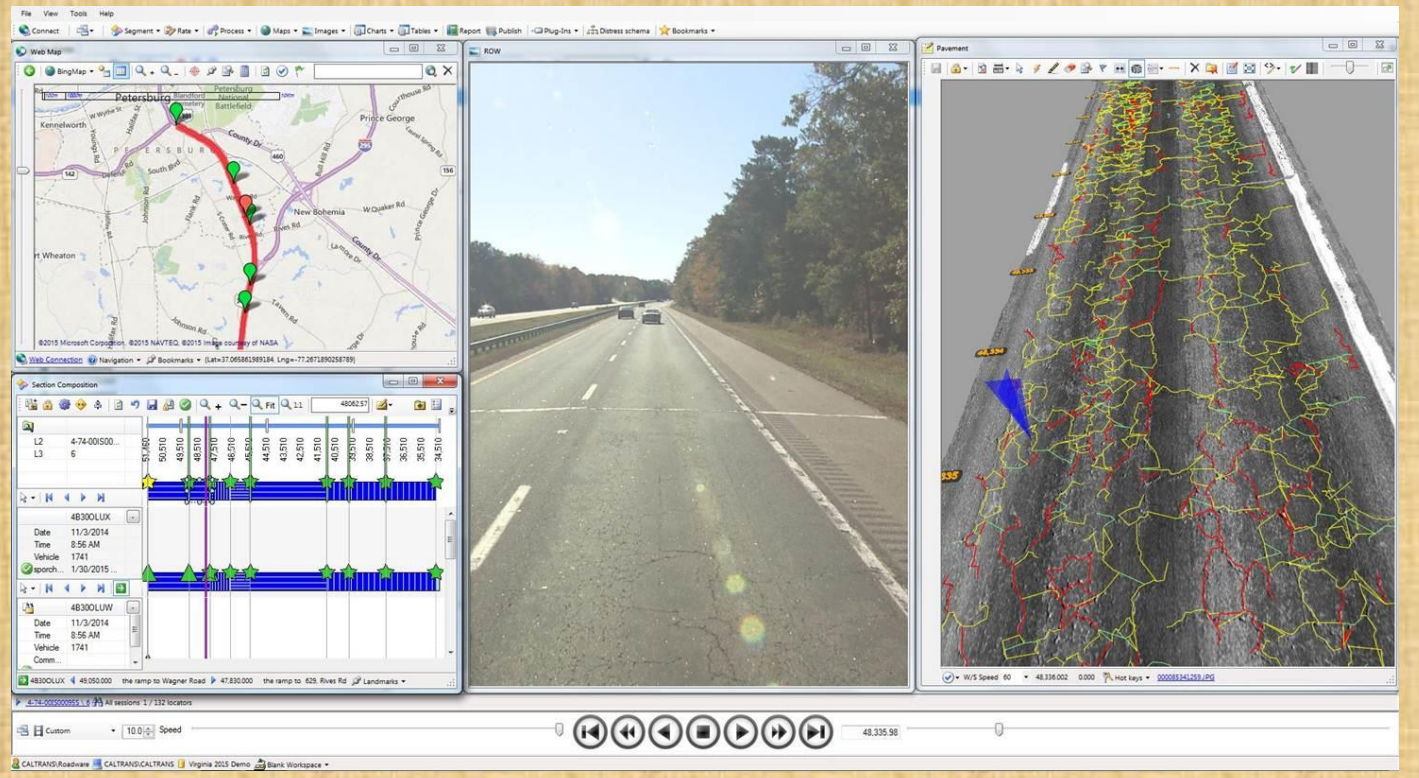
- Comparison of Laser Rut Measuring System & Laser Crack Measuring System

	LRMS	LCMS
Number of Points	1280 points	4096 points
Depth Accuracy	+/-1mm	+/-0.5mm
RAW Storage	.LRMS	.FIS
Sampled File	.TP	Same
Rut Processor	Fugro Roadware	Same



Automated Crack Detection

- Not many variables to adjust
- Automatically detects pavement type and adjusts settings
  - Asphalt, Porous, Concrete, Transverse Tined Concrete, Longitudinally Tined Concrete



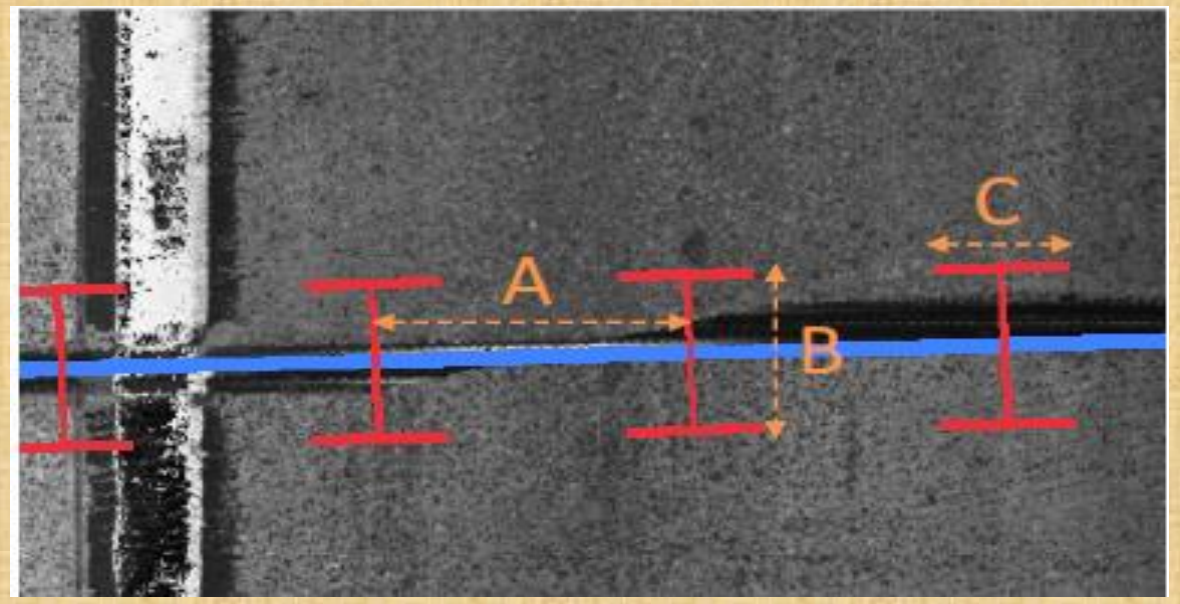
Automated Crack Detection

- What can Pave3D (LCMS) detect?
- Crack widths >2mm

	2D	3D
Resolution	2mm x 2mm	1mm x 5mm
Detection Positives	• Proven Algorithms • Reliable • Good Processing Speed • Good for Manual Rating	• Depth Information • More Consistent • Not light dependent • Better Damp Detection • Less False Positives
Detection Negatives	• Lighting dependent (Shadows) • No depth information • Many False Positives	• Larger RAW Files • Slower Detection

Faulting

- ***Averaging Window Width (mm)*** – **C** – Window width of faulting calculation (Default=200mm)
- ***Measurement Distance (mm)*** – **B** - Longitudinal Distance between two measured points on either side of the joint (Default=300mm)
- ***Position Distance (mm)*** – **A** - Transverse distance between two fault measurements along the joint



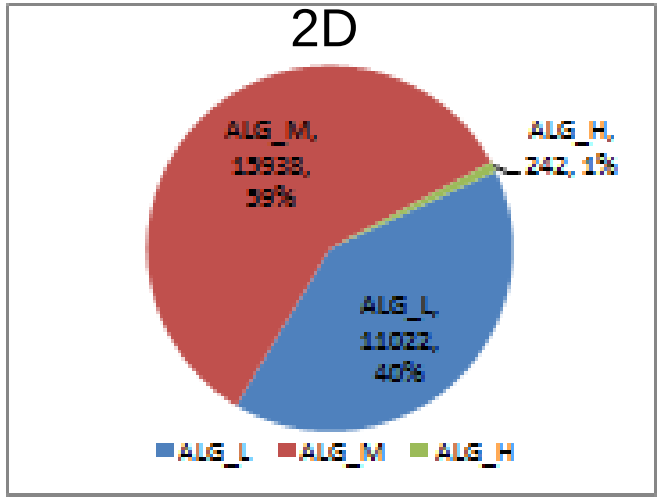
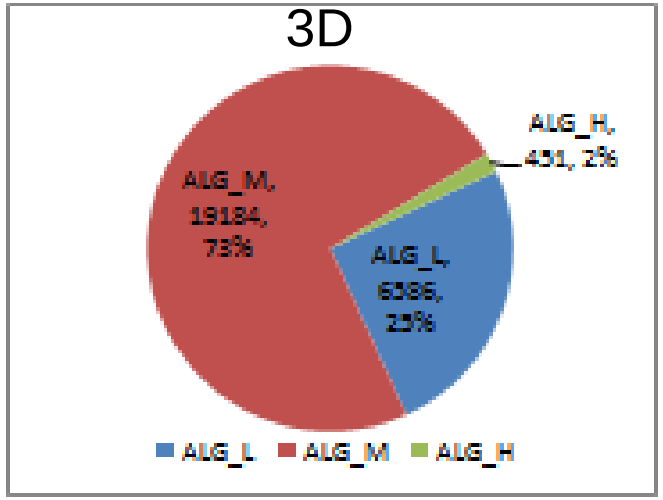
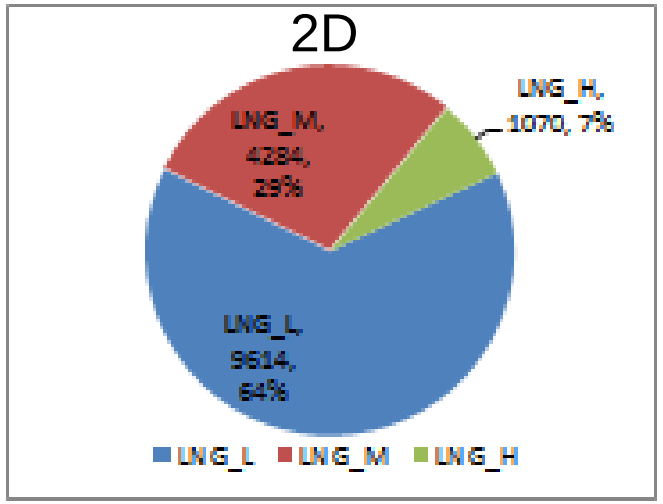
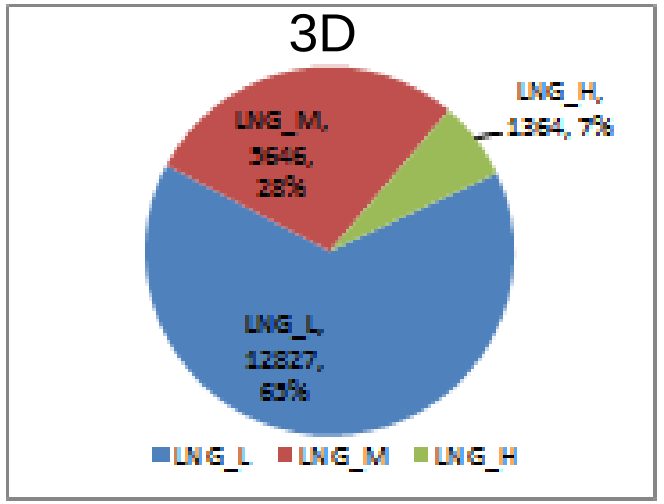
Overall Distress Findings

- 11% More total cracking detected in 3D vs. 2D
- Separate Rating Schemes needed for 3D Composite vs. Flexible
- Composite Sites
  - More cracking detected with 3D on these control sites
  - Much more manual Intervention needed for 2D
- Asphalt Sites
  - Similar amounts of cracking seen with 2D and 3D
  - Highly distressed section (Site 13) saw some differences with rating and bins

SUMMARY			
	LRMS - 2D	**LCMS - 3D**	DIFF
Total Miles	4.489	4.489	
CSECTs	9	9	
LRS_IDs	8	8	
ALG	27,202.00	26,221.00	-3.6%
LNG	14,968.00	19,837.00	33%
TRN	18,696.00	22,562.00	21%
PATCH	6,472.44	6,307.89	-3%
ALL	67,338.44	74,927.89	11%

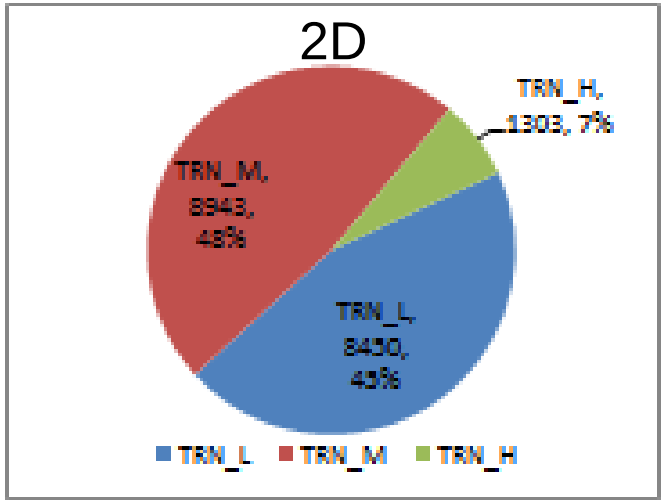
Overall Severity Bins by Distress Type

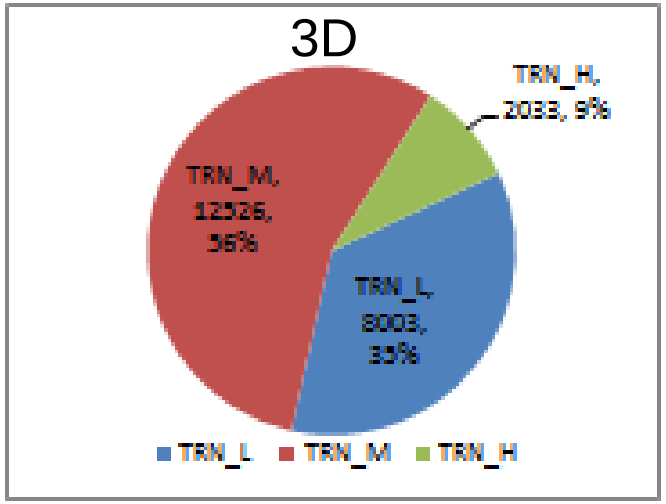
Alligator & Longitudinal Cracking

ALLIGATOR		
LONG		

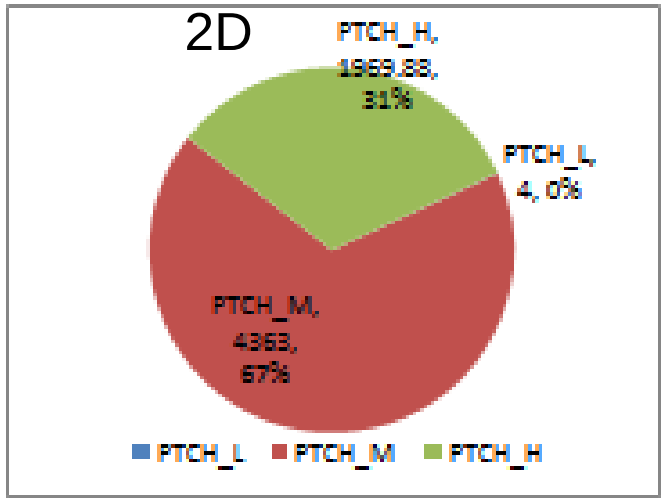
Transverse and Patching

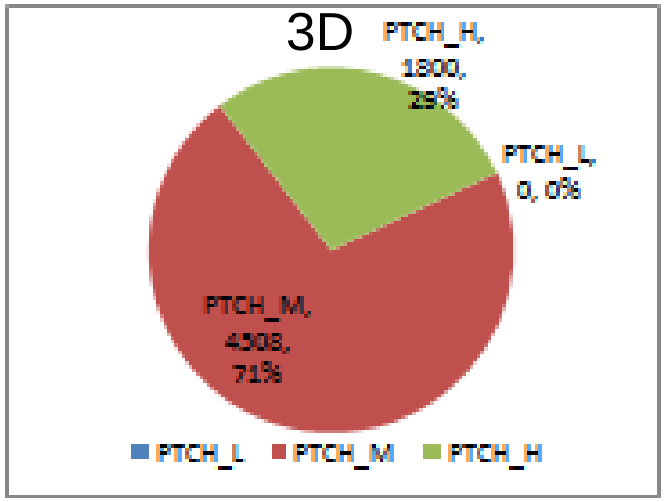
TRANS



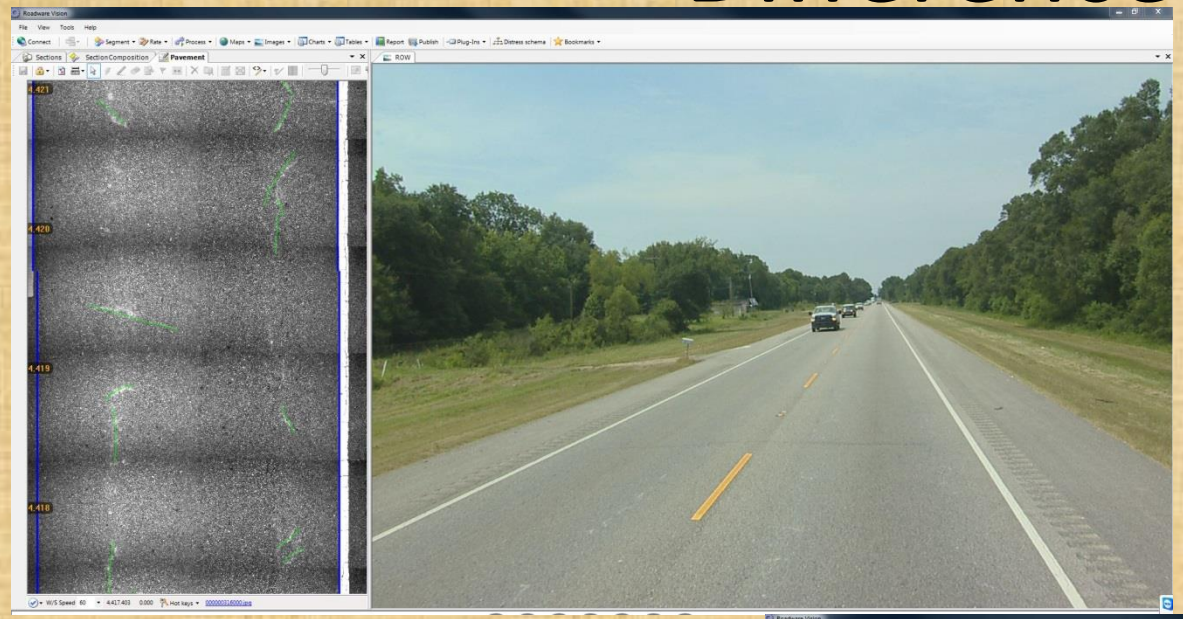


PATCH



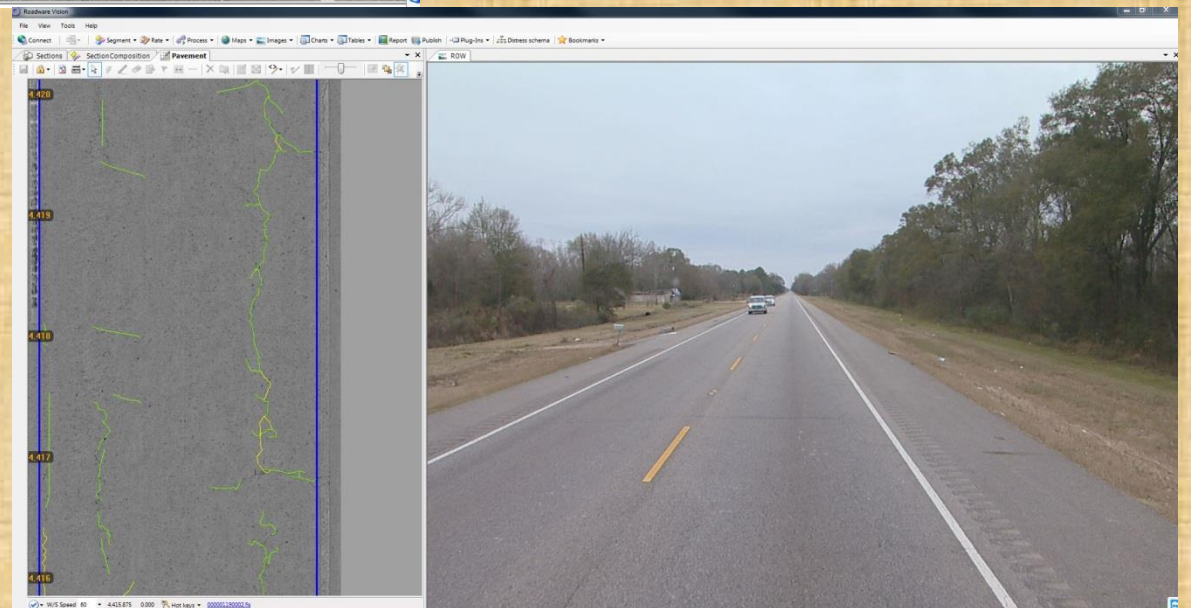


Site 5 – Longitudinal Cracking Difference



Left – 2D image showing a small amount of mostly manually rated longitudinal cracking

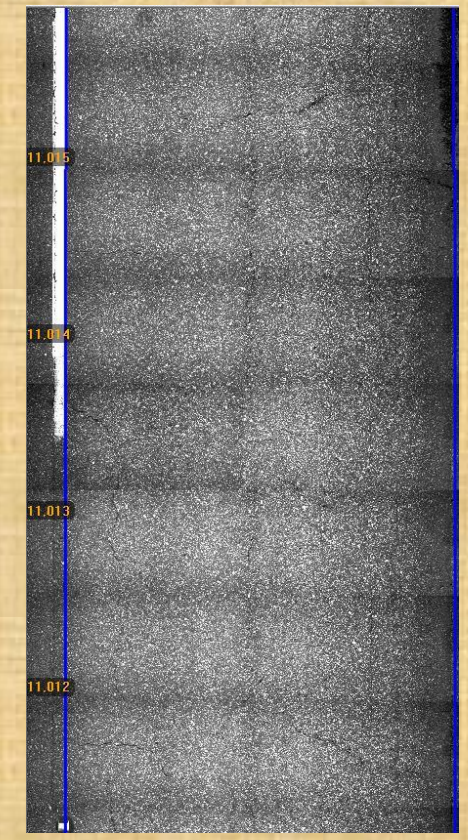
Right – 3D range image showing a considerable amount of more cracking detected compared to the 2D image above



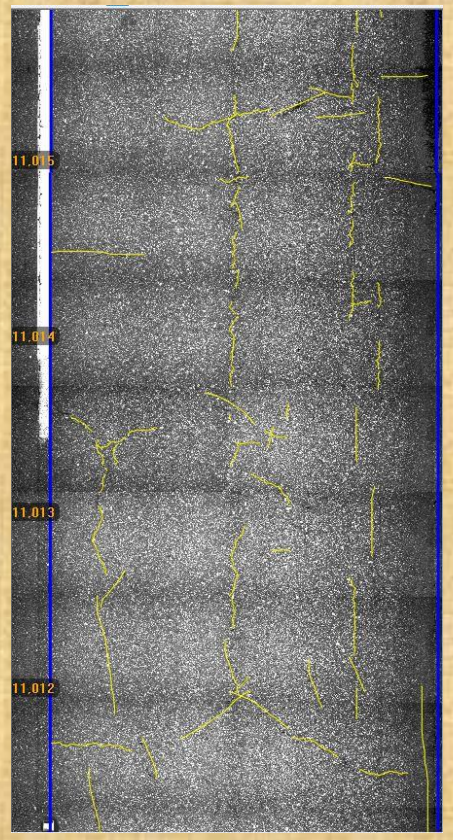
Site 3 –Composite Cracking Difference

2D

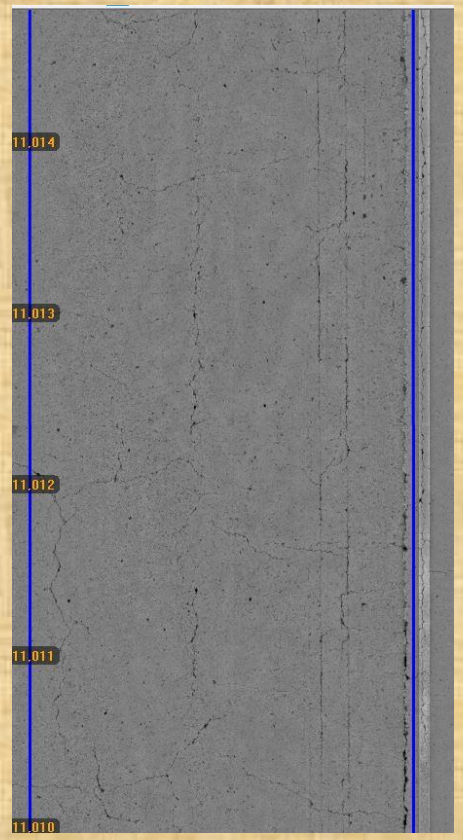
3D



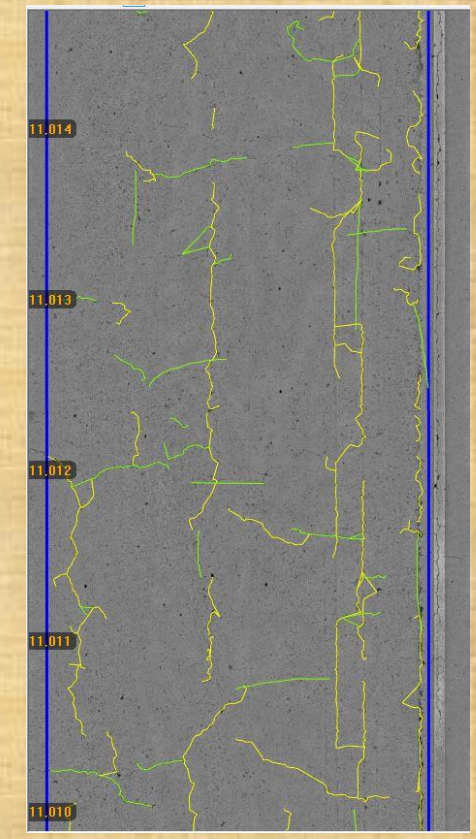
2D Image
No Cracking



2D Image
With Cracking

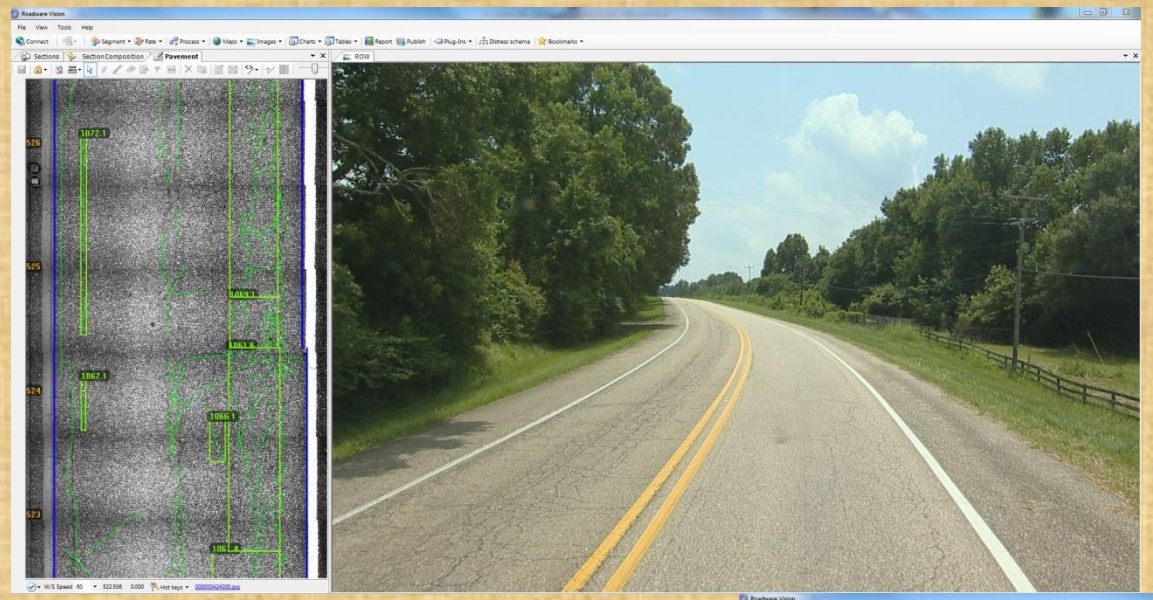


3D Range Image
No Cracking



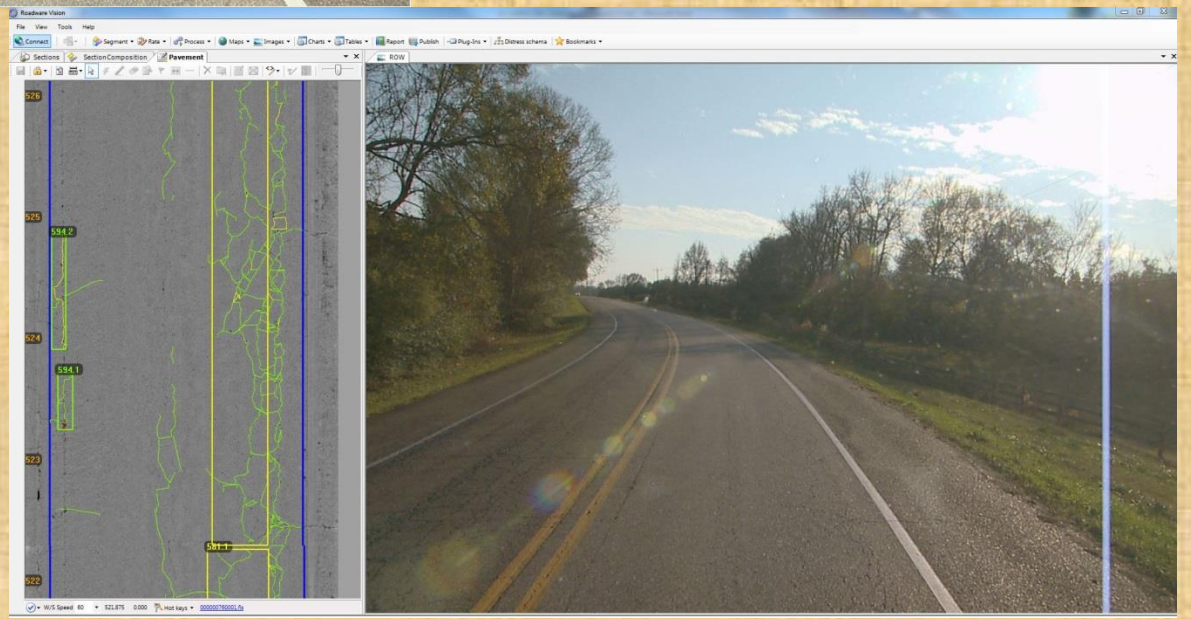
3D Range Image
With Cracking

Site 13 – Alligator Severity Difference



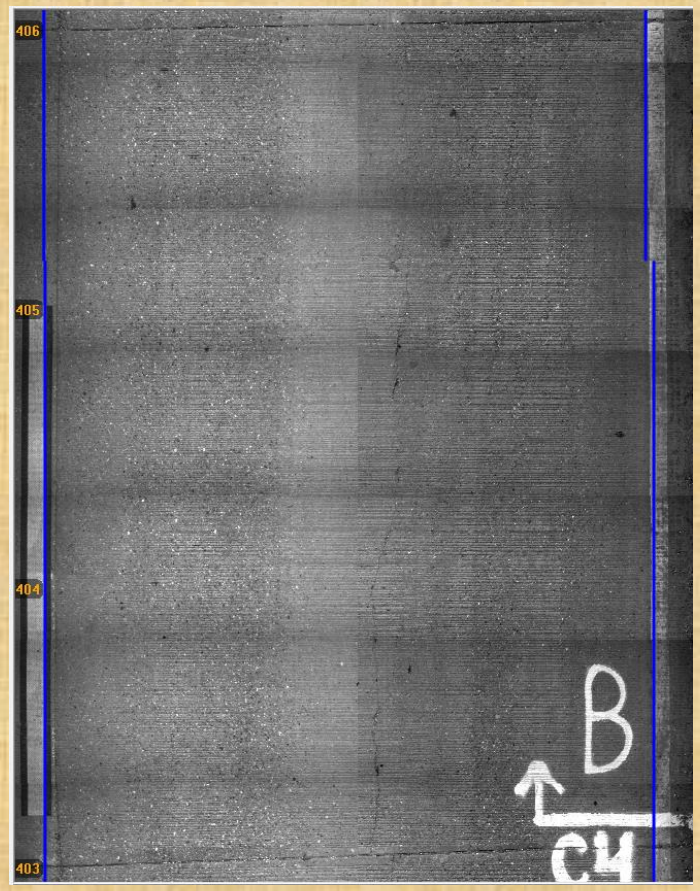
Left – 2D image showing low severity cracks in the RWP with the resulting density causing it to be rated as low severity Alligator

Right – 3D range image showing more low to moderate cracking in the RWP with the resulting higher density causing it to be rated as moderate severity Alligator



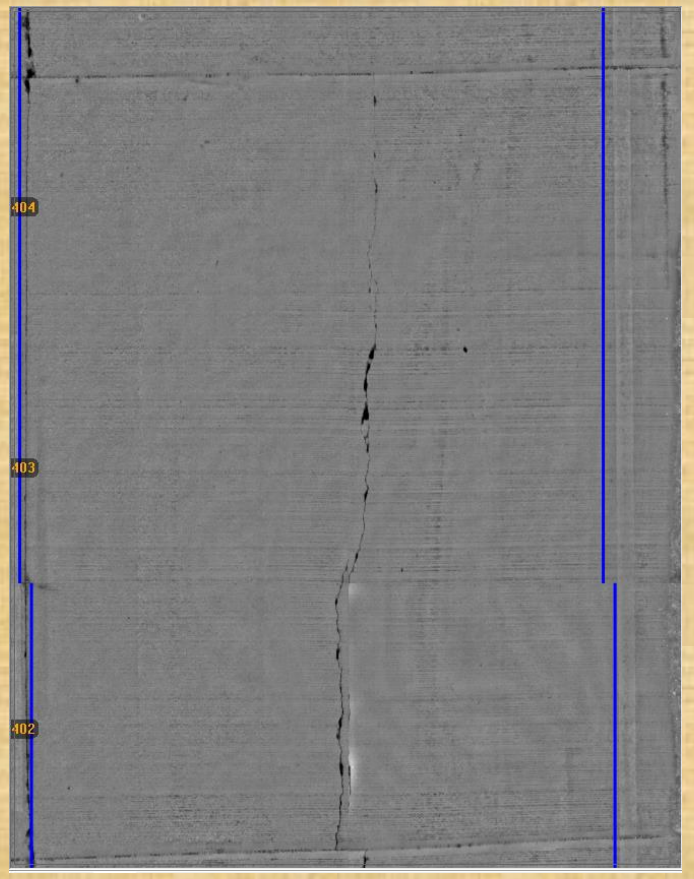
Site 4 – Longitudinal Severity Difference

2D



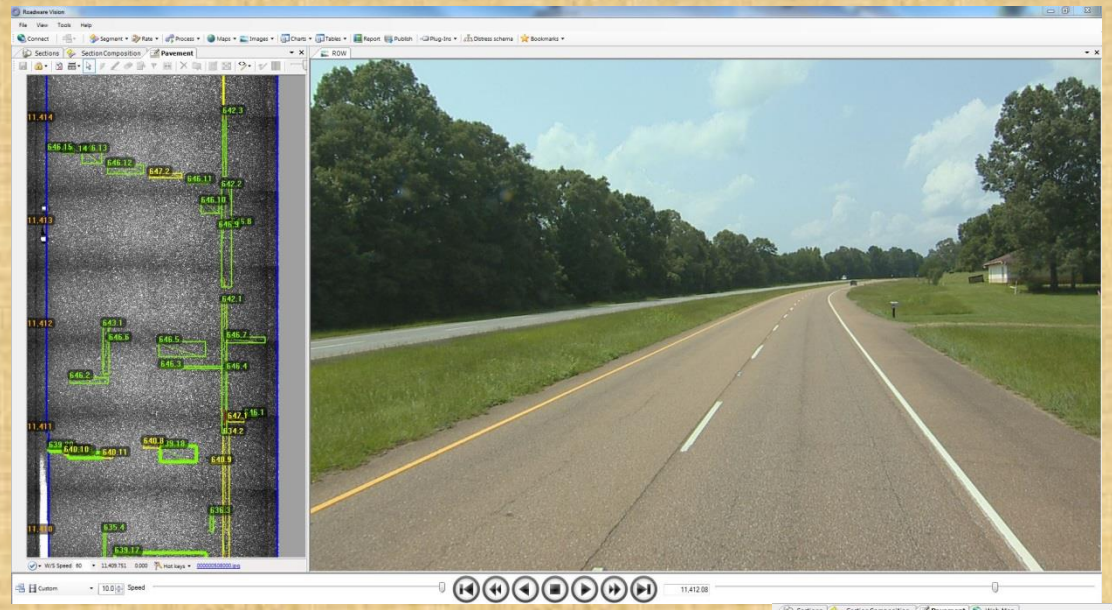
Faint Longitudinal Crack that was rated as low severity

3D



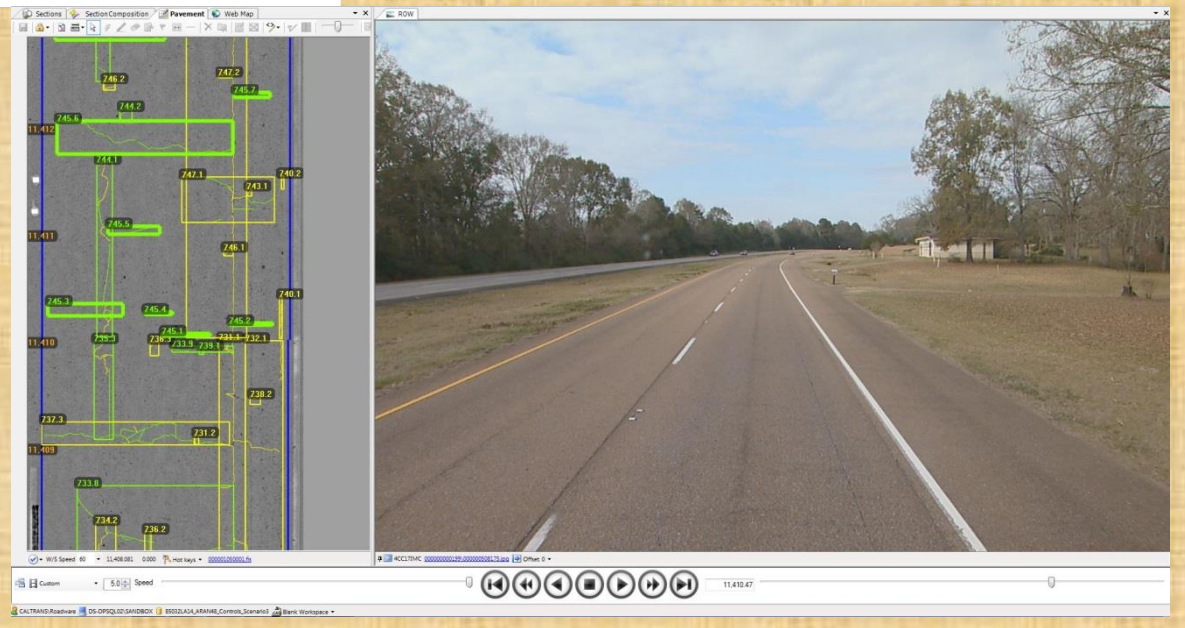
3D Range image shows that this same crack is a moderate severity crack (larger width)

Site 3 – Transverse Cracking Difference



Left – 2D image showing an overall smaller amount of cracking and transverse cracks

Right – 3D range image showing a considerable amount of more cracking detected compared to the 2D image above

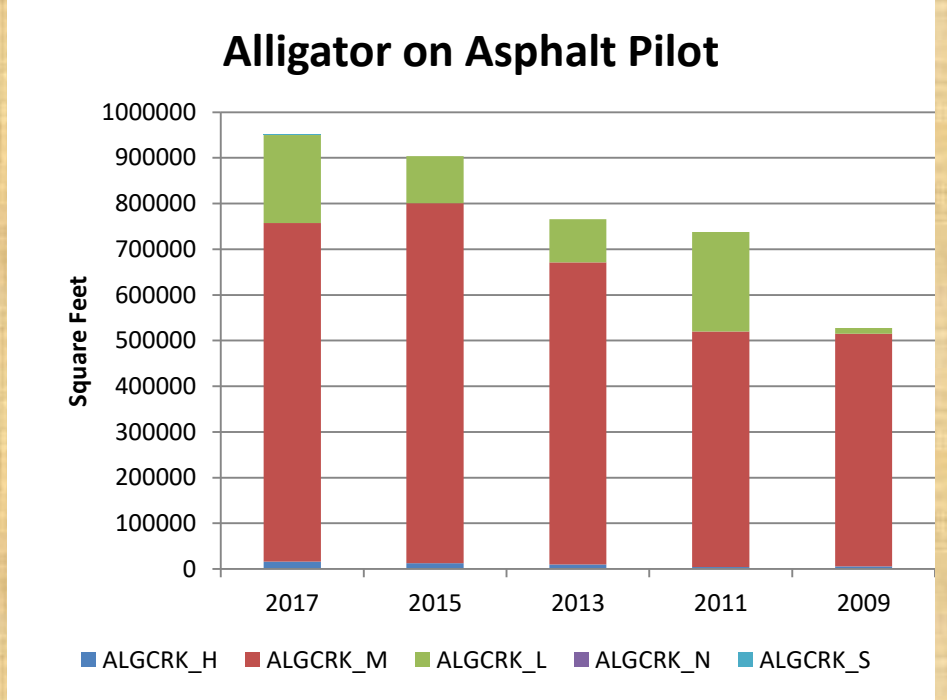


2D vs 3D Conclusion from Test Site

- Longitudinal Cracking proportions of severity similar
- Transverse and Alligator proportion of severity not similar, tends toward more sever
- 3D detected for More Longitudinal and Transverse Cracking
- Decided to create a new category of cracking no deduct for cracks that weren’t visible to 2D because they were to small

2D vs 3D Pilot

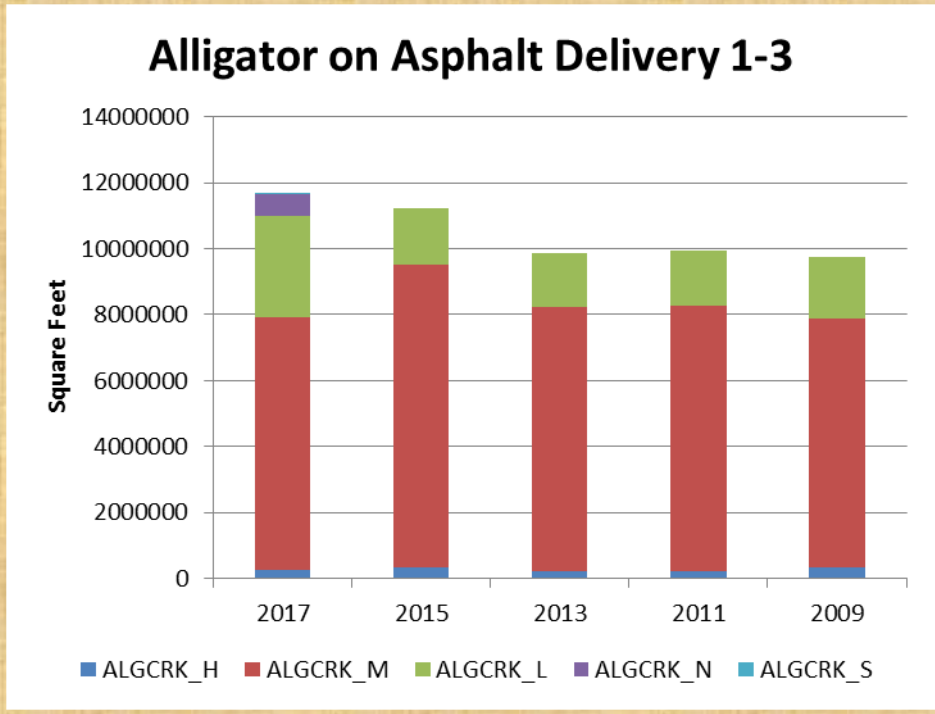
Alligator on Asphalt



Asphalt Alligator Cracking The totals look reasonable. Looks like slight amount of Low needs to be in Medium category.

2D vs Delivery 1-3

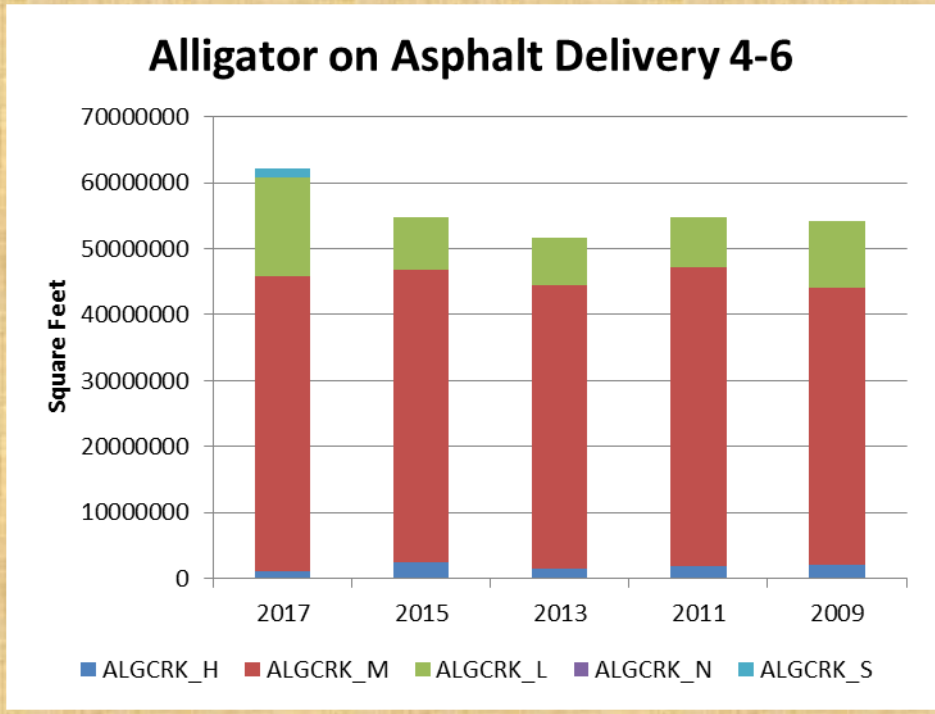
Alligator on Asphalt



Asphalt Alligator Cracking The totals look reasonable. Looks like slight amount of Low needs to be in Medium category.

2D vs Delivery 4-6

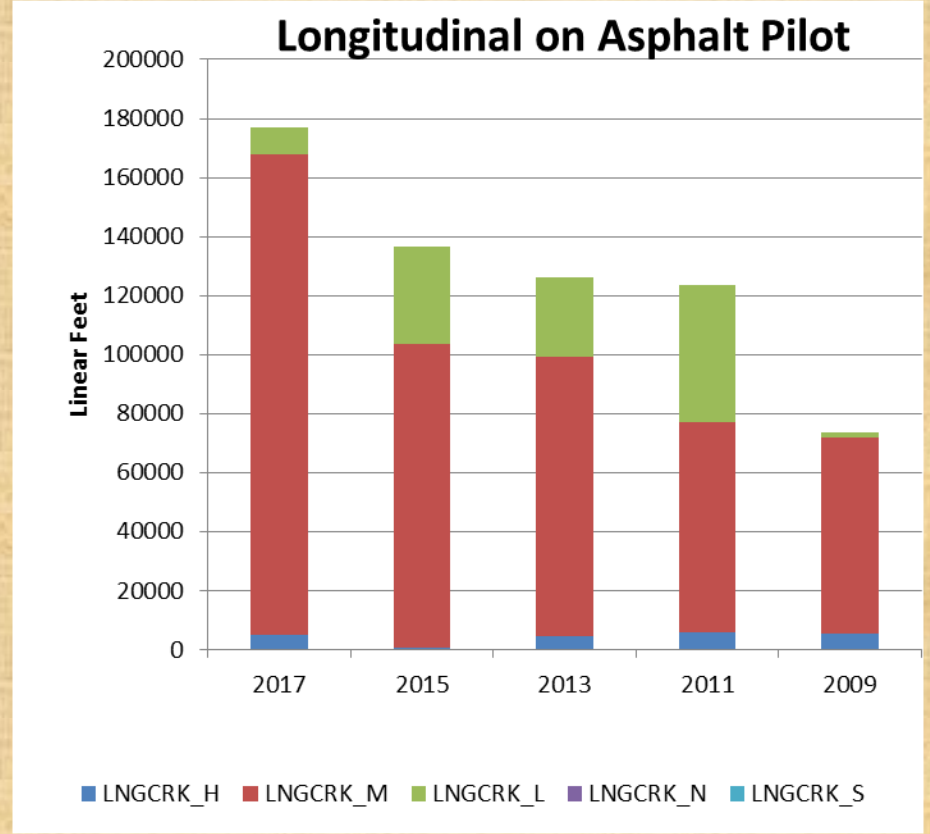
Alligator on Asphalt



Asphalt Alligator Cracking Totals this year look a little higher compared to the last 2 cycles up 11.9% instead of 5.7%. Looks like there needs to be less low and more medium based on past trends.

2D vs 3D Pilot

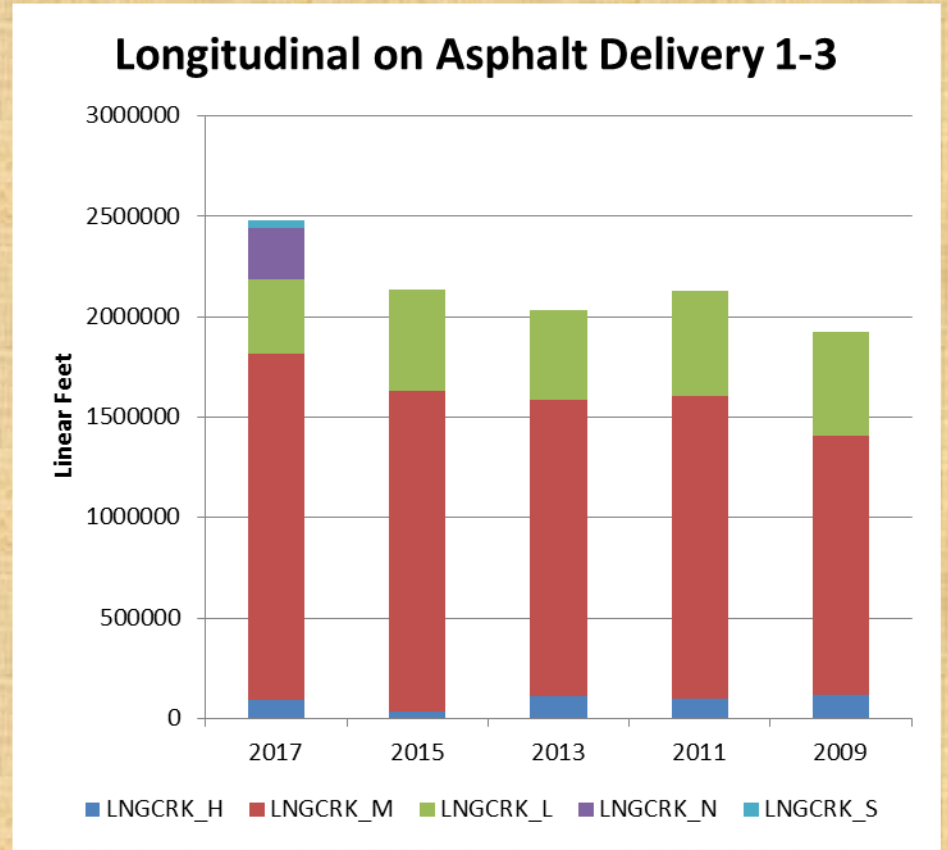
Longitudinal on Asphalt



Asphalt Longitudinal cracking looks high compared to previous 3 cycles and looks like more medium needs to be called Low.

2D vs Delivery 1-3

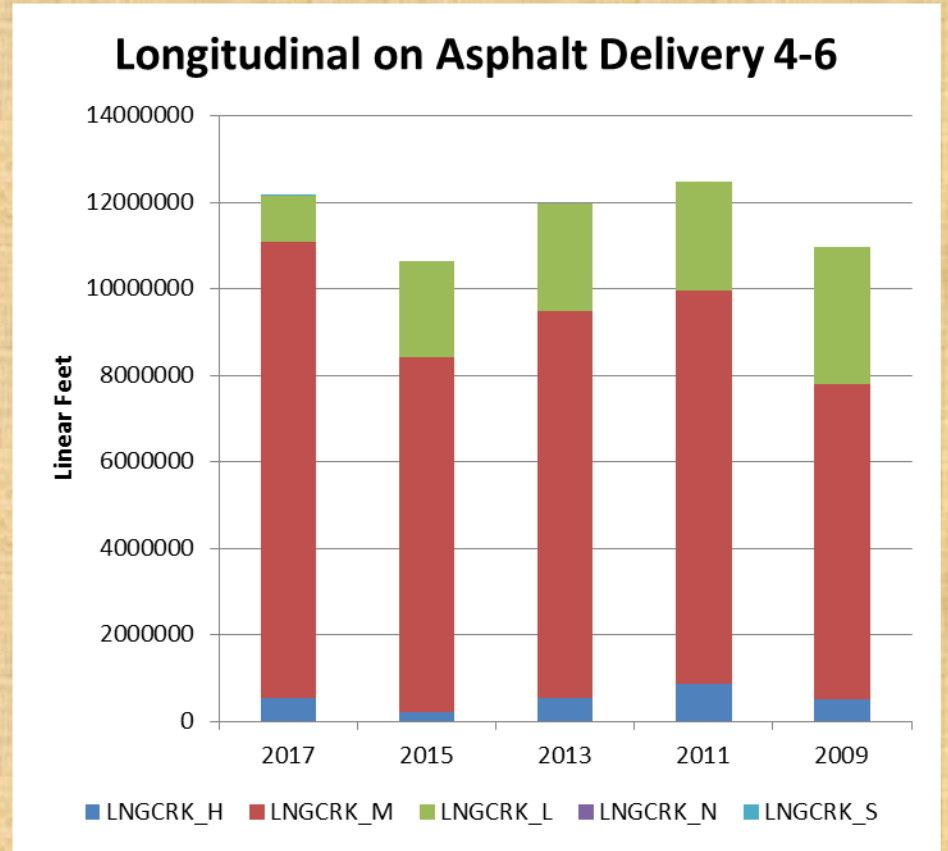
Longitudinal on Asphalt



Asphalt Longitudinal cracking All values look reasonable compared to trends of past.

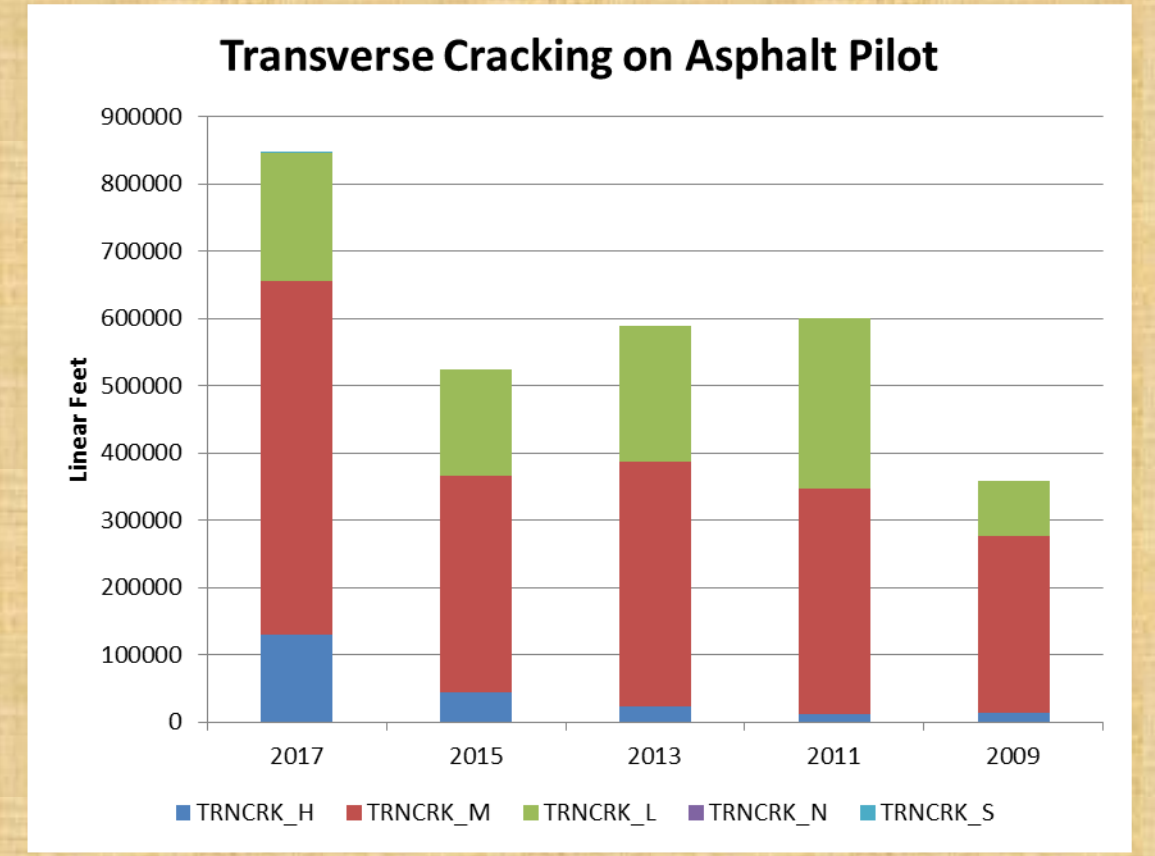
2D vs Delivery 4-6

Longitudinal on Asphalt



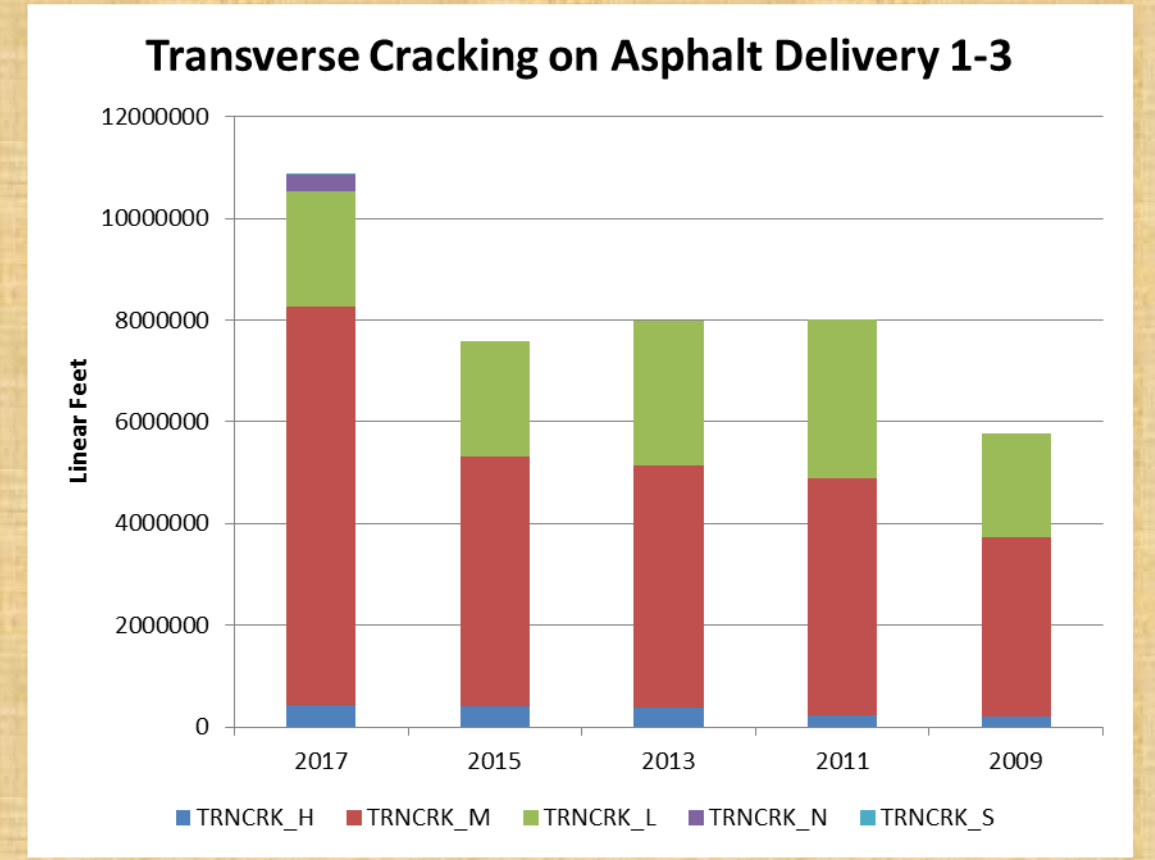
Asphalt Longitudinal cracking Total cracking looks like it could be alright compared to previous cycle and looks like more medium needs to be called Low.

2D vs 3D Pilot



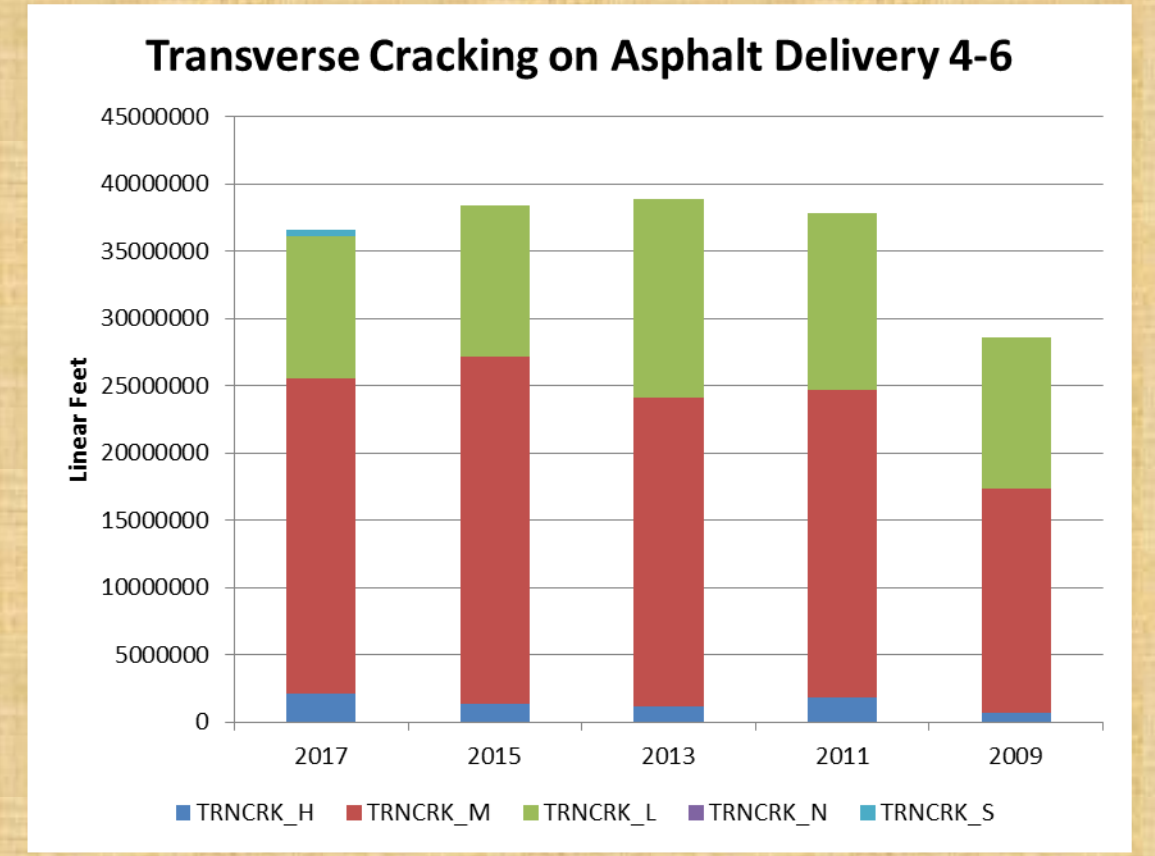
Asphalt Transverse Cracking totals look a lot higher than past so we are probably finding cracks that we didn't count in past which means we need more cracks in no distress category. The high severity cracking has increased a lot more than expected so, more should be counted as medium.

2D vs 3D Delivery 1-3



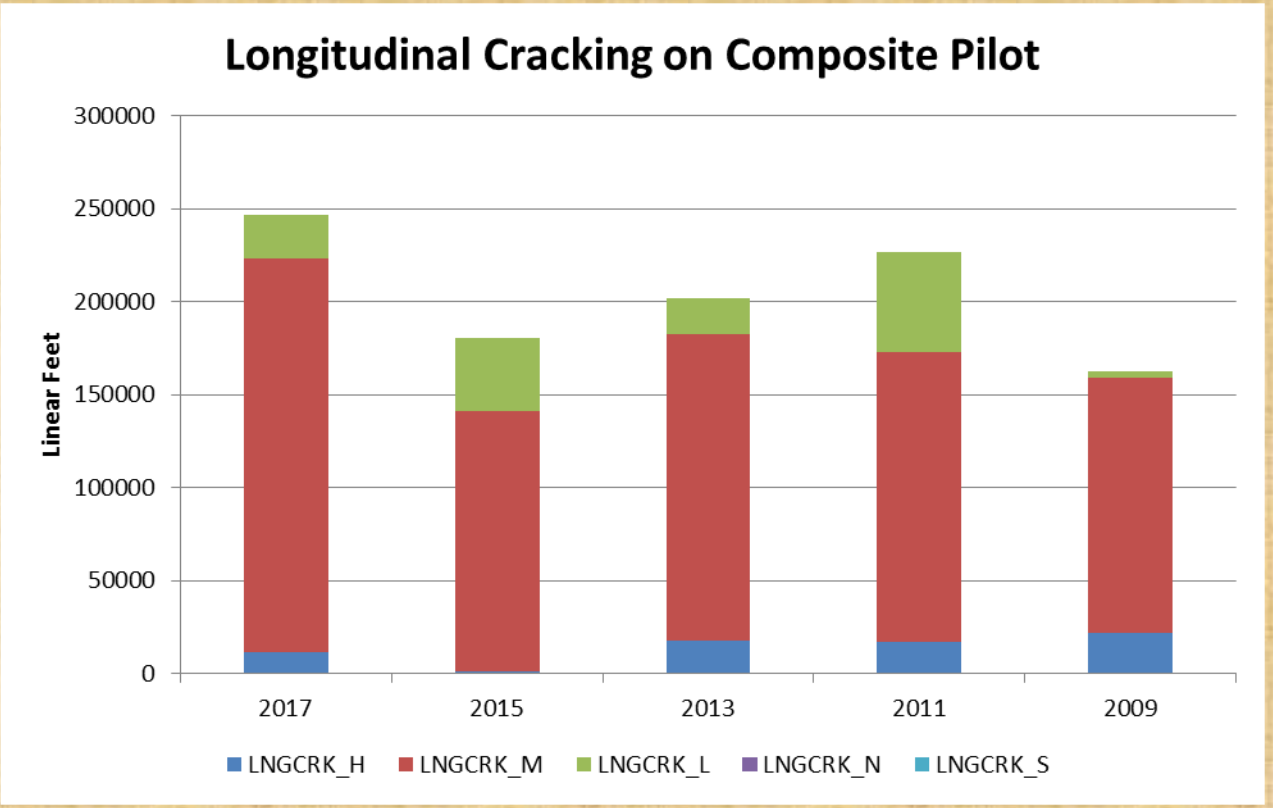
Asphalt Transverse Cracking Totals look a lot higher than past so we are probably finding cracks that we didn't count in past which means we need more cracks in no distress category as well as some medium to low category.

2D vs 3D Delivery 4-6



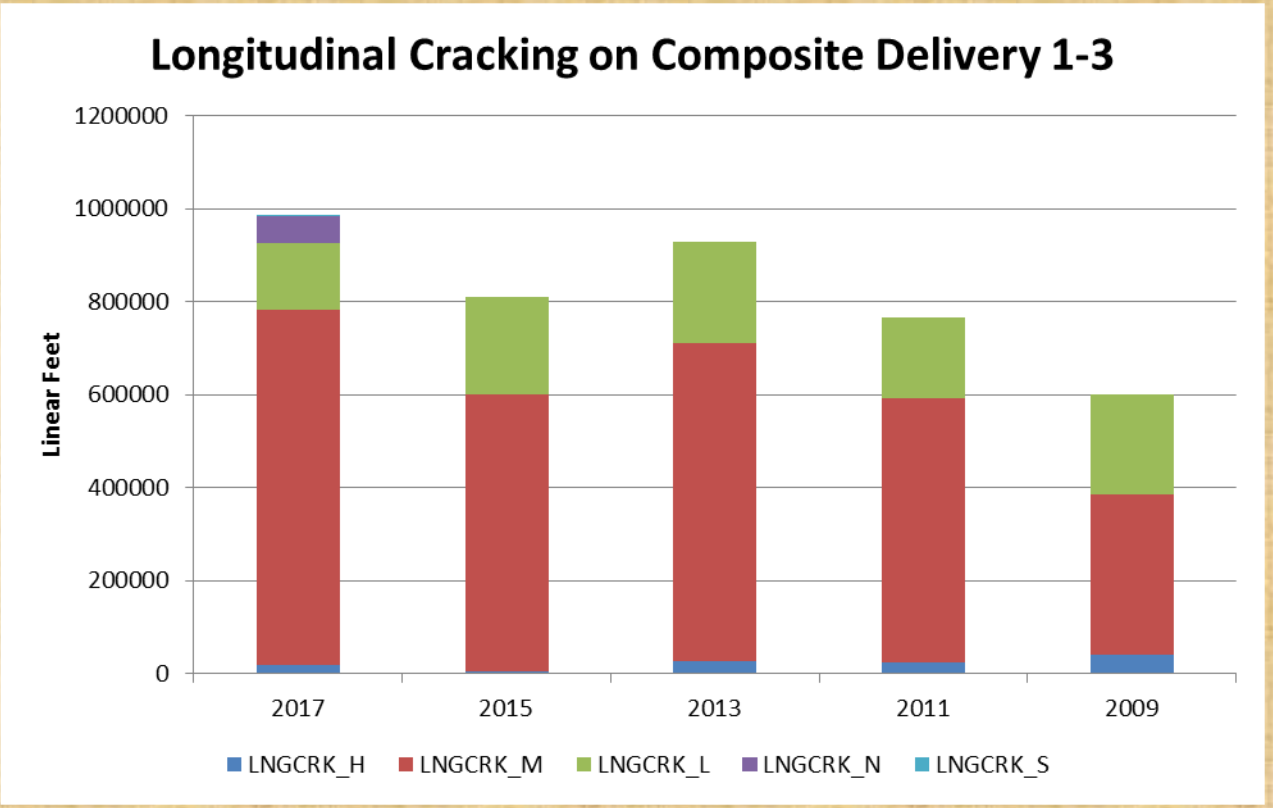
Asphalt Transverse Cracking Totals look a <u>little</u> less than last 2 cycles. Proportions in past have always tended toward more Medium than Low. It is close to 5% change, so, if other deliveries are close to 5% the **cracking total** should be acceptable.

2D vs 3D Pilot



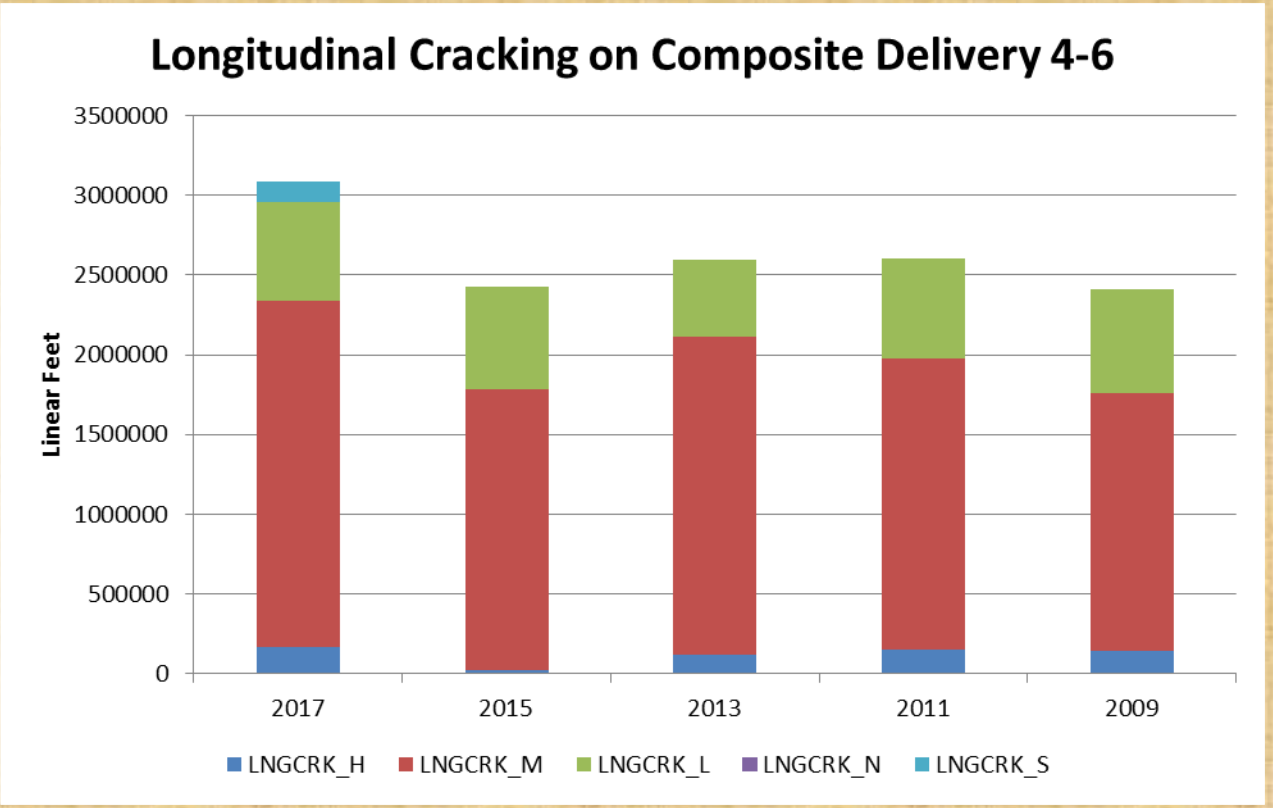
Composite Longitudinal Cracking, the previous years are not consistent enough to make a decision on what to change.

2D vs 3D Delivery 1-3



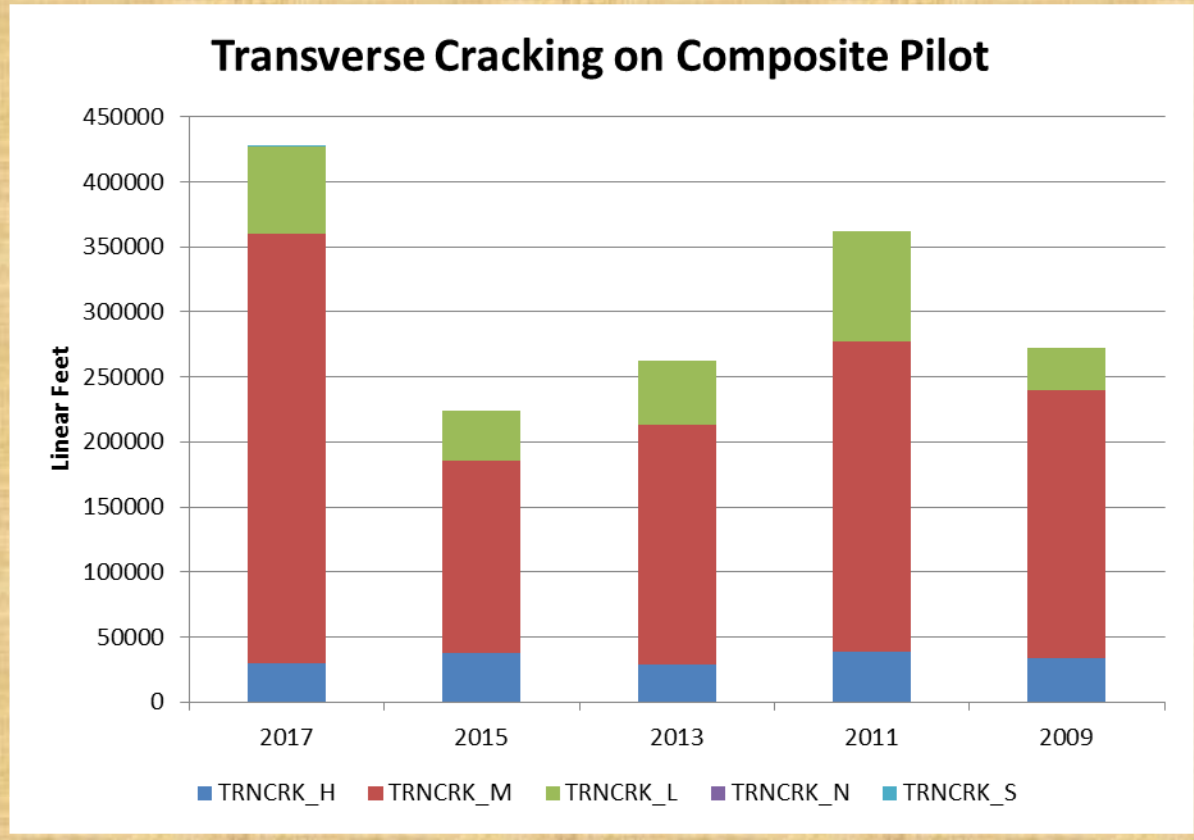
Composite Longitudinal Cracking, Looks reasonable, the previous years are not consistent enough to make a decision on if this needs to change.

2D vs 3D Delivery 4-6



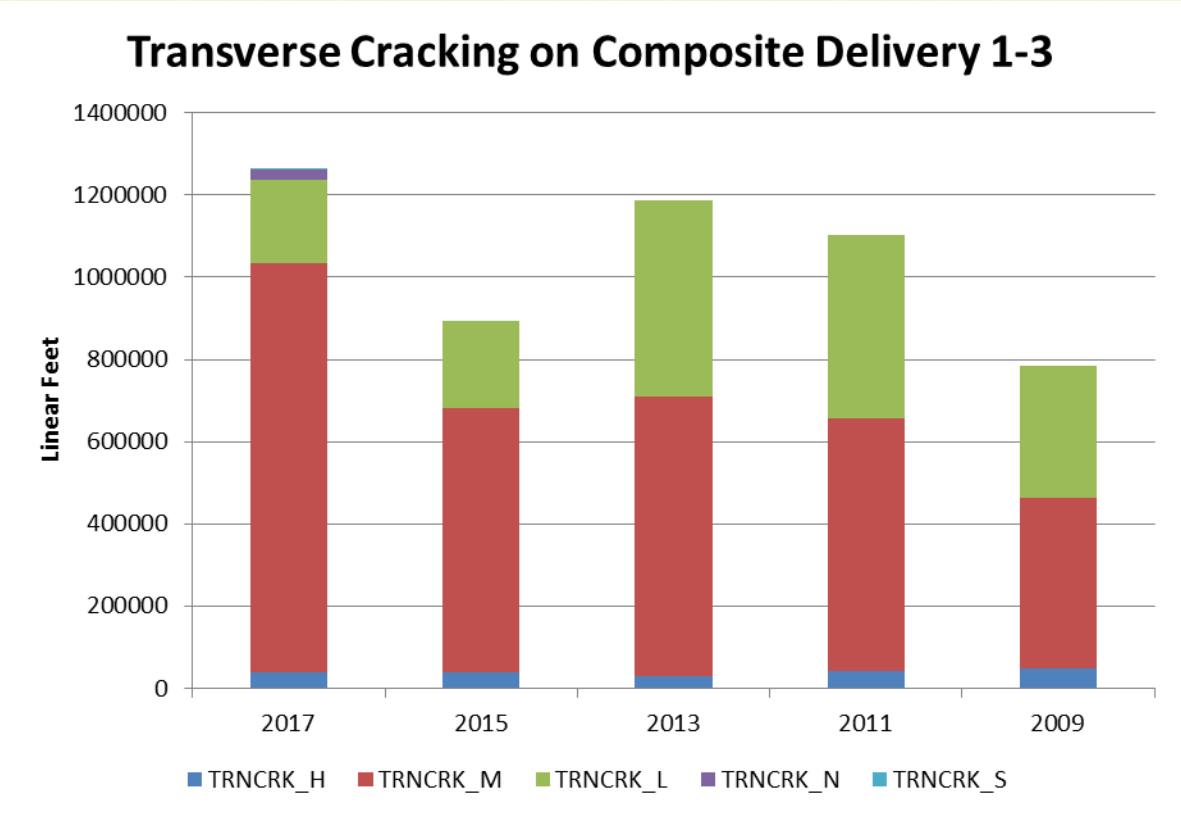
Composite Longitudinal Cracking, The current cycle seems higher than the previous delivery. The previous cycles are not consistent but are at least within one Y graph range. The increase in cracking is a 21.4% increase when I was hoping at the most a 5% increase.

2D vs 3D Pilot



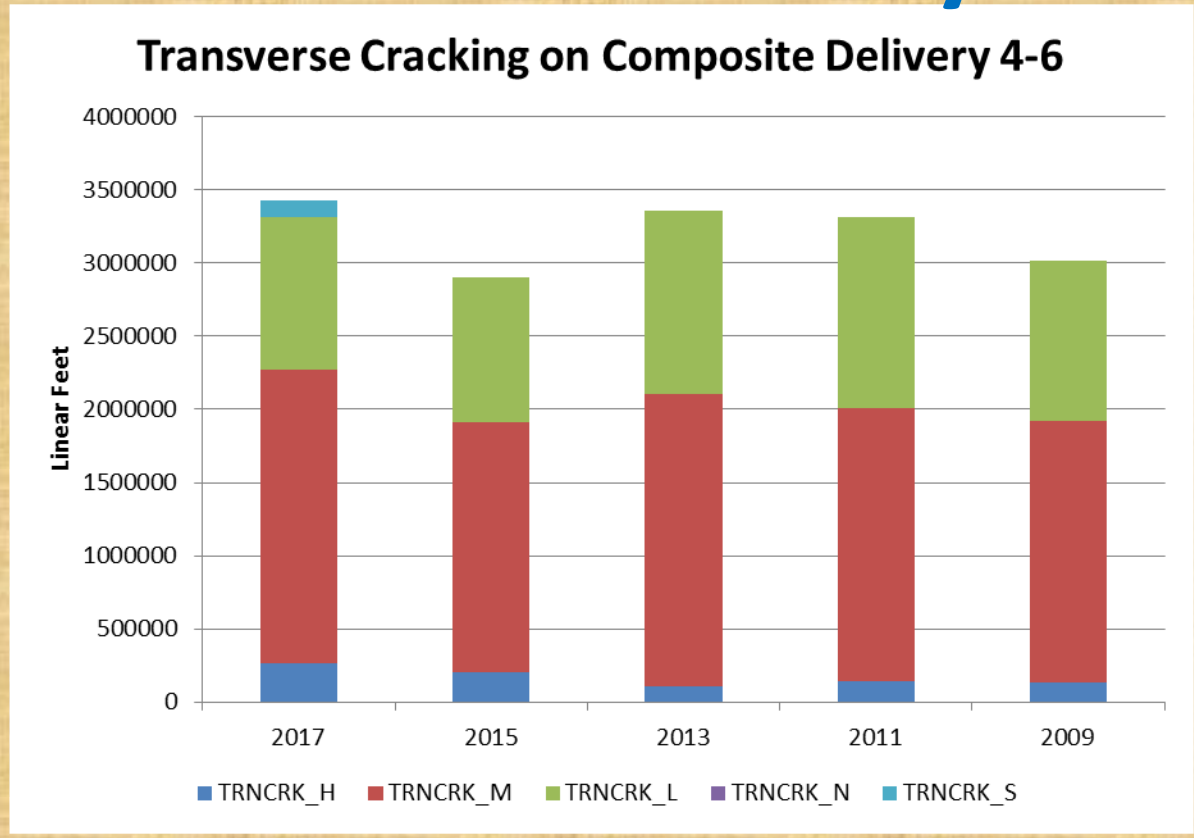
Composite Transverse Cracking, Looks like the total cracking is a lot higher than previous years but the previous years are not consistent (level of cracking going down) but doubling from last year's numbers.

2D vs 3D Delivery 1-3



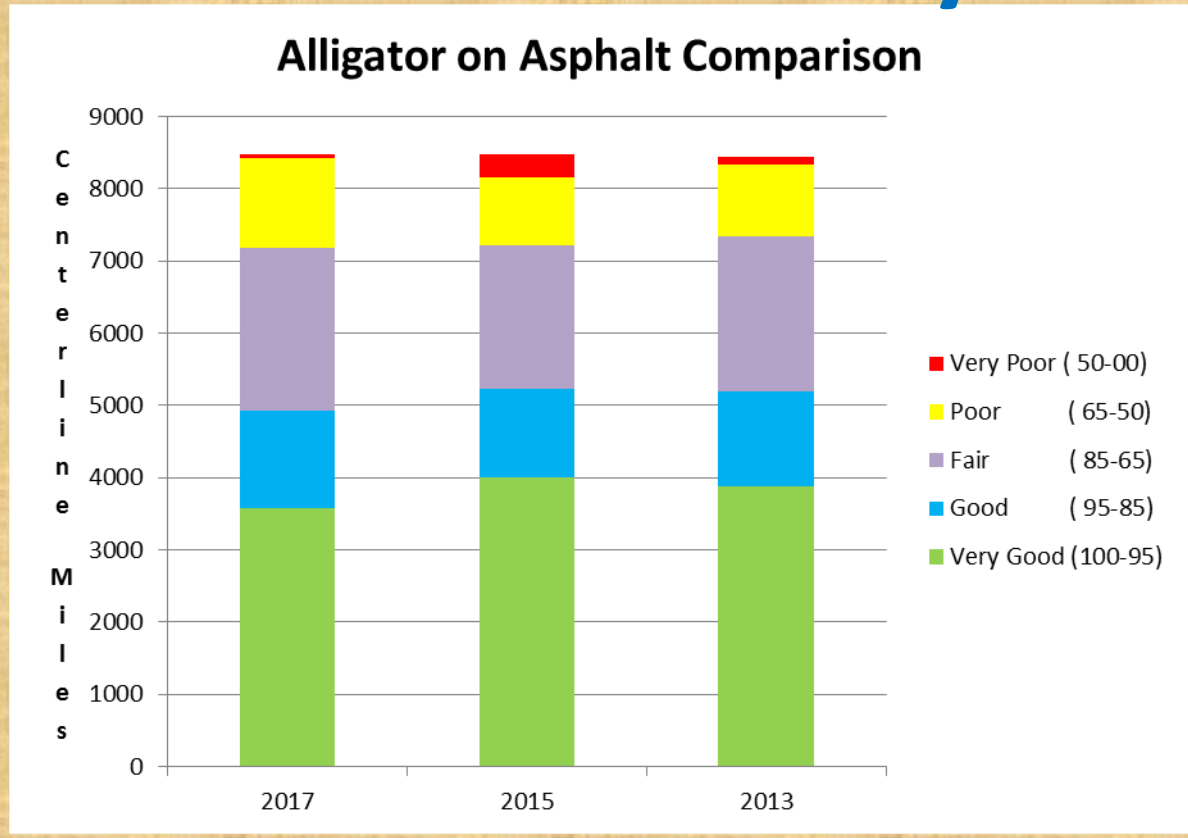
Composite Transverse Cracking, Looks reasonable compared to 2013 and 2011 but not to 2015 If we believe 2015 or questionable then it might be fine but if we believe 2015 is correct then more would have to be put in no distress range as well as medium moved to low severity range.

2D vs 3D Delivery 4-6



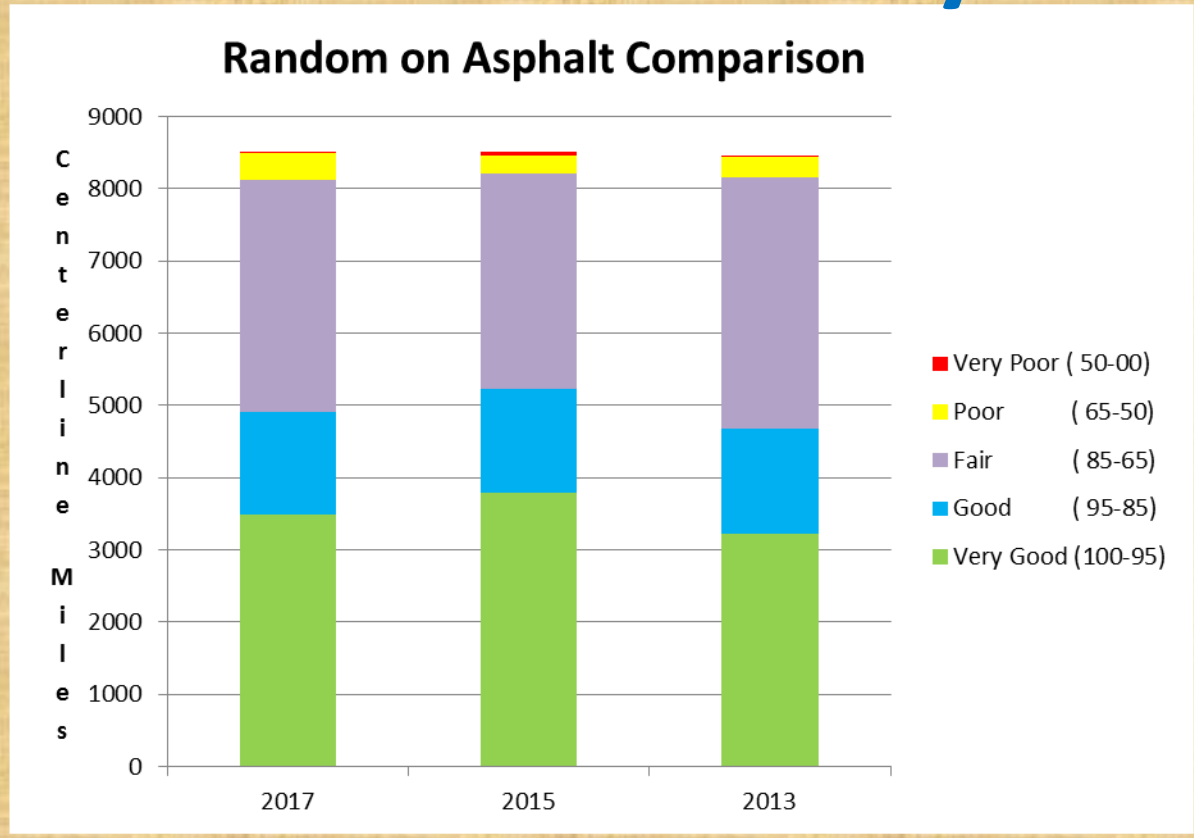
Composite Transverse Cracking, This delivery total looks a lot higher (15.5% increase) than the previous totals but consistent with 2013 and 2011. Since it is consistent with more years than not we believe it possible could be acceptable if more deliveries show the same trend.

2D vs 3D Delivery 4-6



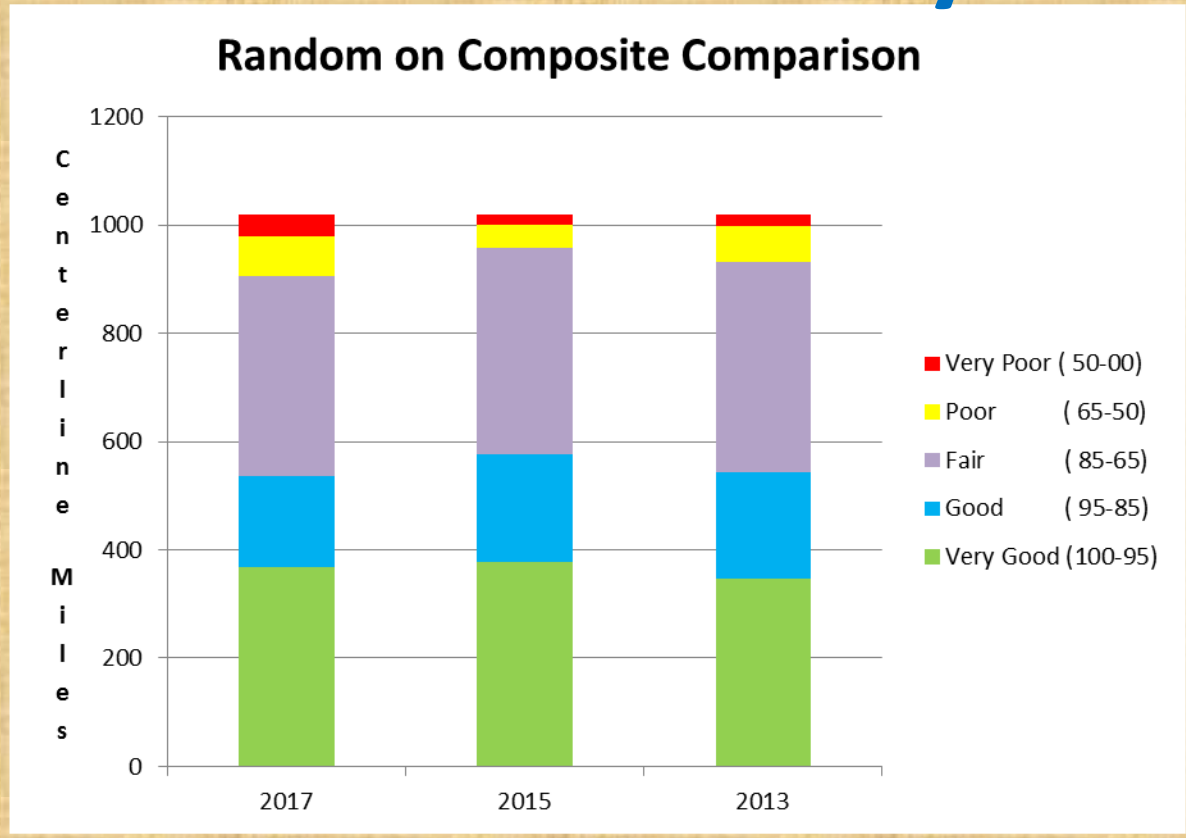
Alligator on Asphalt Comparison Goodness Ranges (Based on Collector Ranges) 2017 3D looks very similar to ranges for 2013 and 2015 2D on mileage except the Very Poor and Poor ranges

2D vs 3D Delivery 4-6



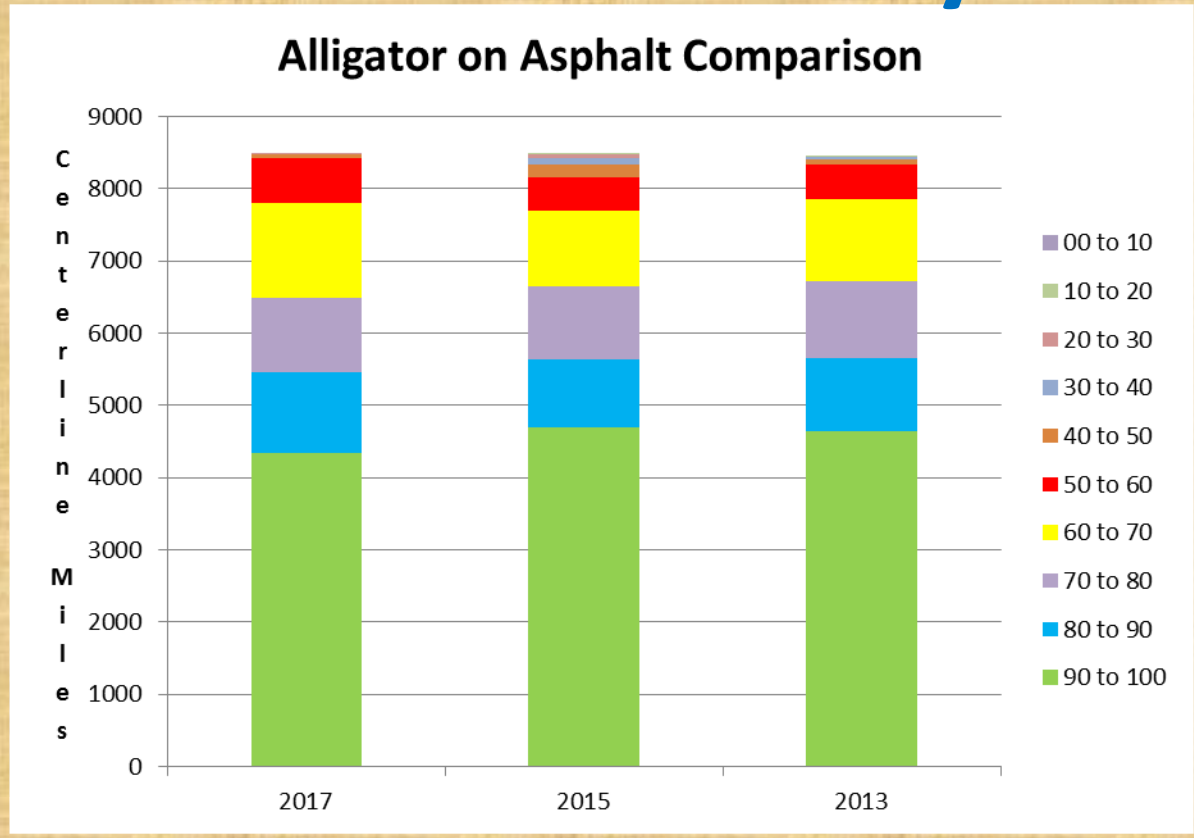
Random on Asphalt Comparison Goodness Ranges (Based on Collector Ranges) 2017 3D looks very similar to ranges for 2013 and 2015 2D on mileage except the Very Poor and Poor ranges

2D vs 3D Delivery 4-6



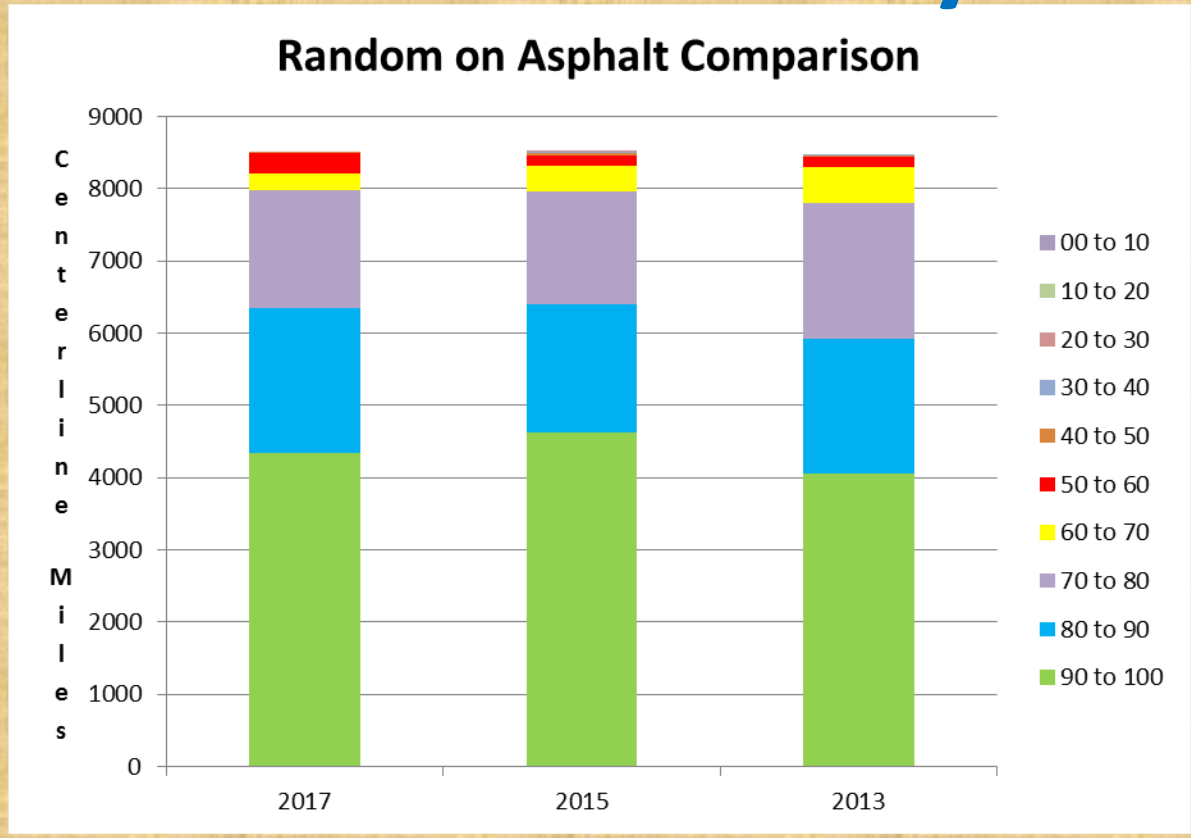
Random on Composite Comparison Goodness Ranges (Based on Collector Ranges) 2017 3D looks very similar to ranges for 2013 and 2015 2D on mileage except the Very Poor and Poor ranges

2D vs 3D Delivery 4-6



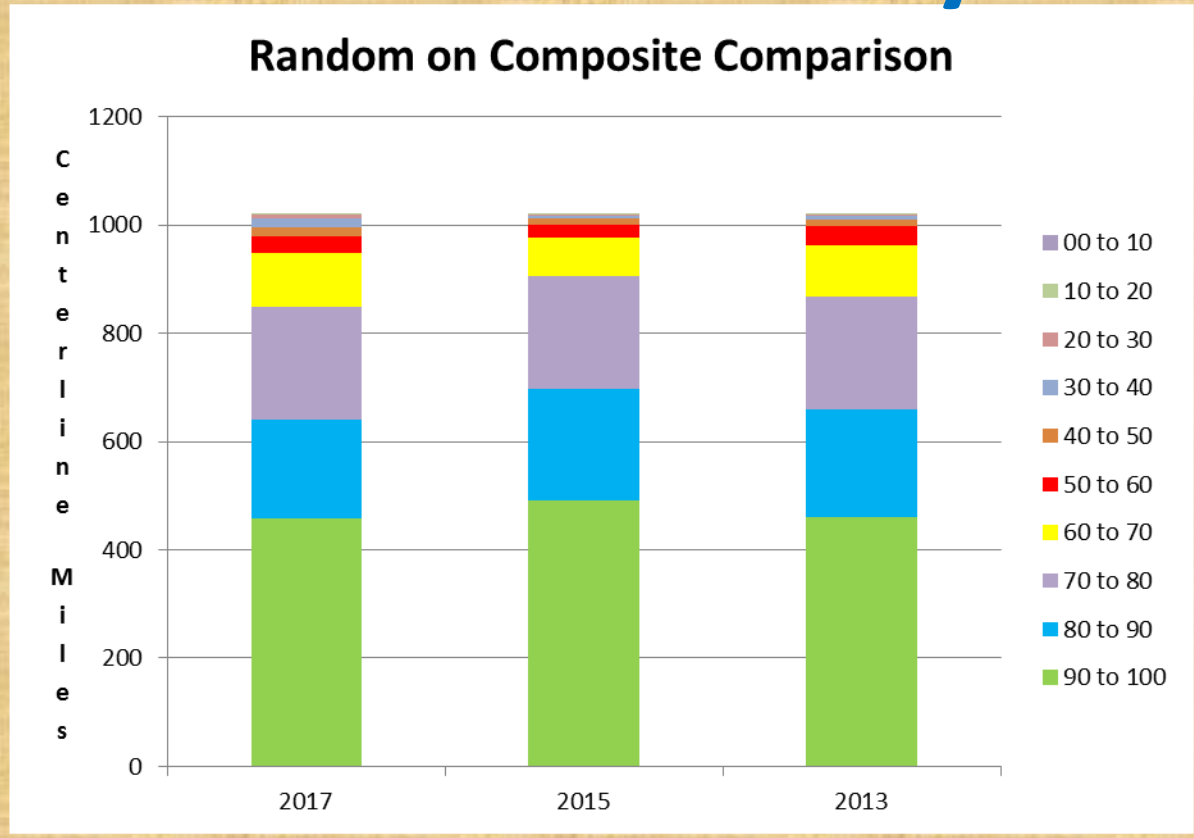
Alligator on Asphalt Comparison Goodness Ranges (Based on Collector Ranges) 2017 3D looks very similar to ranges for 2013 and 2015 2D on mileage except below 50-0 range which is the Very Poor range on the Goodness.

2D vs 3D Delivery 4-6



Random on Asphalt Comparison Goodness Ranges (Based on Collector Ranges) 2017 3D looks very similar to ranges for 2013 and 2015 2D on mileage with very slight differences.

2D vs 3D Delivery 4-6



Random on Composite Comparison Goodness Ranges (Based on Collector Ranges) 2017 3D looks very similar to ranges for 2013 and 2015 2D on mileage except the Very Poor and Poor is a lot higher than 2015 but closer to ranges for 2013

2D vs 3D Conclusion 2017 Collection

- Composite Longitudinal Cracking and Alligator bin levels need to be retested to see if we can get cracking totals closer to historic values by putting some distress values in to no distress category and get poor severities closer to historic trends
- The index ranges seem to have the same % proportion of severity levels except the poor and very poor ranges. So, believe it shouldn’t effect our deterioration ranges.

FAULTING

MAP-21 Future Pavement Objectives & Measures

- PM2 Required Pavement Performance Measures
  - Faulting
    - Good < 0.10 inches
    - Fair >= 0.10 & <= 0.15 inches
    - Poor > 0.15 inches
    - 30 inch Wheel Path – (AASHTO R36-13)
    - Right Wheel Path Only
  - AASHTO References
    - R36-13
      - Method A – (LADOTD Requires)
      - Method B – very strongly advised against this

MAP-21 Future Pavement Objectives & Measures

	Total Faults	3266	Real Time Min 0.1 inch FALT_AVG_RT	Post Proc. Min 0.1 inch FALT_AVG_PP	1mm min Threshold FALT_AVG_PP	No Minimum Tied To Joints FALT_AVG_PP	# of Joints With No Faulting	New Average With 0 faults FALT_AVG_PP
	% Faults 0.0	1.8%						
Miles	6.057	**Average**	**0.105**	**0.028**	**0.048**	**0.011**	**58**	**0.011**
Counts	Faulting < 0.05		24	52	28	62		62
	Faulting 0.05 - 0.15		22	7	32	0		0
	Faulting > 0.15		16	3	2	0		0
	# of 0.1 mile segments		62	62	62	62		62
Percent	Faulting < 0.05		38.7%	83.9%	45.2%	100.0%		100.0%
	Faulting 0.05 - 0.15		35.5%	11.3%	51.6%	0.0%		0.0%
	Faulting > 0.15		25.8%	4.8%	3.2%	0.0%		0.0%

Goodness Ranges Using New FEDERAL Ranges

INTERSTATE

SURFACE_TYPE	GOODNESS_OVERALL		SumOfLENGTH	GOODNESS_RUT		GOODNESS_ROUGHNESS		GOODNESS_CRACKING		GOODNESS_FAULTING		STRUCTURE_TYPE
2	FAIR		0.1	GOOD		GOOD		POOR				
2	FAIR		0.1	GOOD		POOR	0.1	GOOD				
2	FAIR		0.2	GOOD		FAIR		FAIR				
2	FAIR		0.3	FAIR		FAIR		POOR	0.3			
2	FAIR		0.3	FAIR		GOOD						
2	FAIR		1.1	POOR	1.1	FAIR		GOOD				
2	FAIR		1.2	POOR	1.2	FAIR		FAIR				
2	FAIR		1.32	FAIR		POOR	1.32	GOOD				
2	FAIR		2.06	GOOD		GOOD		FAIR				
2	FAIR		2.6	FAIR		FAIR		FAIR				
2	FAIR		3.1	GOOD		FAIR		GOOD				
2	FAIR		3.592	POOR	3.592	GOOD		FAIR				
2	FAIR		14.952	FAIR		FAIR		GOOD				
2	FAIR		15.1	POOR	15.1	GOOD		GOOD				
2	FAIR		15.4	FAIR		GOOD		POOR	15.4			
2	FAIR		43.272	FAIR		GOOD		FAIR				
2	FAIR		407.862	FAIR		GOOD		GOOD				
2	GOOD		40.692	GOOD		GOOD		GOOD				
2	POOR	0.1	0.1	POOR	0.1	POOR	0.1	FAIR				
2	POOR	0.124	0.124	POOR	0.124	POOR	0.124	GOOD				
2	POOR	0.2	0.2	POOR	0.2	GOOD		POOR	0.2			
3	FAIR		0.2			FAIR				GOOD		
3	FAIR		0.2			POOR	0.2			FAIR		
3	FAIR		2.3			GOOD		GOOD		FAIR		
3	FAIR		2.7			POOR	2.7			GOOD		
3	FAIR		14.716			FAIR		GOOD		POOR	14.72	
3	FAIR		16.984			POOR	16.98	GOOD		FAIR		
3	FAIR		38.696			POOR	38.7	GOOD		GOOD		
3	FAIR		64.804			FAIR		GOOD		FAIR		
3	FAIR		287.546			FAIR		GOOD		GOOD		
3	GOOD		126.6			GOOD		GOOD		GOOD		
3	POOR	0.1	0.1			POOR	0.1			POOR	0.1	
3	POOR	15.08	15.08			POOR	15.08	GOOD		POOR	15.08	

SURFACE_TYPE	GOODNESS_OVERALL		SumOfLENGTH	GOODNESS_RUT		GOODNESS_ROUGHNESS		GOODNESS_CRACKING		GOODNESS_FAULTING		STRUCTURE_TYPE
5	FAIR		1.6			POOR	1.6	GOOD				
5	FAIR		26.7			FAIR		GOOD				
5	GOOD		3.8			GOOD		GOOD				
7	FAIR		0.1	GOOD		FAIR						
7	FAIR		0.1	GOOD		GOOD		POOR	0.1			
7	FAIR		0.2	FAIR		FAIR						
7	FAIR		0.2	FAIR		POOR	0.2	FAIR				
7	FAIR		0.2	GOOD		FAIR		FAIR				
7	FAIR		0.4	FAIR		POOR	0.4					
7	FAIR		0.4	GOOD		POOR	0.4	GOOD				
7	FAIR		0.5	FAIR		GOOD						
7	FAIR		0.7	GOOD		GOOD		FAIR				
7	FAIR		1.124	GOOD		FAIR		GOOD				
7	FAIR		1.6	FAIR		FAIR		POOR	1.668			
7	FAIR		1.668	FAIR		POOR	1.668	GOOD				
7	FAIR		4.4	POOR	4.4	FAIR		FAIR				
7	FAIR		4.9	POOR	4.9	FAIR		GOOD				
7	FAIR		5.1	FAIR		FAIR		FAIR				
7	FAIR		5.9	POOR	5.9	GOOD		FAIR				
7	FAIR		6.52	GOOD		POOR	6.52					
7	FAIR		10	FAIR		GOOD		POOR	10			
7	FAIR		11	POOR	11	GOOD		GOOD				
7	FAIR		15.368	FAIR		FAIR		GOOD				
7	FAIR		30.9	FAIR		GOOD		FAIR				
7	FAIR		193.856	FAIR		GOOD		GOOD				
7	GOOD		52.5	GOOD		GOOD		GOOD				
7	POOR	0.1	0.1	POOR	0.1	POOR	0.1					
7	POOR	0.1	0.1	POOR	0.1	POOR	0.1	GOOD				
7	POOR	0.2	0.2	POOR	0.2	POOR	0.2	POOR	0.2			
7	POOR	0.4	0.4	POOR	0.4	POOR	0.4	FAIR				
7	POOR	2	2	POOR	2	GOOD		POOR	2			
7	POOR	2.7	2.7	POOR	2.7	FAIR		POOR	2.7			
		21.1	1508.84		53.12		86.99		32.57		29.9	
		1.40%			3.52%		5.77%		2.16%		1.98%	

NON-INTERSTATE NATIONAL HIGHWAY SYSTEM

SURFACE_TYPE	GOODNESS_OVERALL		SumOfLENGTH	GOODNESS_RUT		GOODNESS_ROUGHNE		GOODNESS_CRACKIN		GOODNESS_FAULTING		STRUCTURE_TYPE
2	FAIR		1.3	GOOD		FAIR						
2	FAIR		12.088	GOOD		FAIR		FAIR				
2	FAIR		36.688	GOOD		FAIR		GOOD				
2	FAIR		1.2	GOOD		FAIR		POOR	1.2			
2	FAIR		0.1	POOR	0.1	FAIR						
2	FAIR		24.096	GOOD	18.2	GOOD		FAIR				
2	FAIR		0.8	GOOD	27.06	GOOD		POOR	0.8			
2	FAIR		0.7	GOOD	15.12	POOR	0.7					
2	FAIR		1.9	GOOD	18.69	POOR	1.9	FAIR				
2	FAIR		3.696	GOOD	0.178	POOR	3.696	GOOD				
2	FAIR		3.548	GOOD	8.364	GOOD						
2	FAIR		0.8	FAIR	11.1	FAIR						
2	FAIR		73.65	FAIR	2.104	FAIR		FAIR				
2	FAIR		62.016	FAIR	19.28	FAIR		GOOD				
2	FAIR		32.512	FAIR	31.58	FAIR		POOR	32.51			
2	FAIR		87.653	FAIR	0.4	GOOD		FAIR				
2	FAIR		8.628	FAIR	13.6	POOR	8.628	GOOD				
2	FAIR		153.02	FAIR	20.18	GOOD		GOOD				
2	FAIR		30.76	FAIR	19.96	GOOD		POOR	30.76			
2	FAIR		0.38	FAIR	0.5	POOR	0.38					
2	FAIR		16.792	FAIR	17.6	POOR	16.792	FAIR				
2	FAIR		0.1	FAIR	25.93	GOOD						
2	FAIR		18.2	POOR	18.2	GOOD		GOOD				
2	FAIR		27.064	POOR	27.06	FAIR		FAIR				
2	FAIR		15.124	POOR	15.12	FAIR		GOOD				
2	FAIR		18.688	POOR	18.69	GOOD		FAIR				
2	GOOD		229.7	GOOD	1.9	GOOD		GOOD				
2	POOR	0.178	0.178	POOR	0.178	POOR	0.178					
2	POOR	8.364	8.364	POOR	8.364	GOOD		POOR	8.364			
2	POOR	11.1	11.1	POOR	11.1	POOR	11.1	FAIR				
2	POOR	2.104	2.104	POOR	2.104	POOR	2.104	GOOD				
2	POOR	19.28	19.28	POOR	19.28	POOR	19.28	POOR	19.28			
2	POOR	31.58	31.583	POOR	31.58	FAIR		POOR	31.58			
2	POOR	6.459	6.459	FAIR		POOR	6.459	POOR	6.459			
3	FAIR		99.894			POOR	99.894	GOOD		GOOD		
3	FAIR		107.17			POOR	107.169	GOOD		FAIR		
3	FAIR		0.9			FAIR				GOOD		
3	FAIR		0.1			FAIR		FAIR		GOOD		
3	FAIR		35.532			FAIR		GOOD		FAIR		
3	FAIR		195.99			FAIR		GOOD		GOOD		
3	FAIR		8.673			FAIR		GOOD		POOR		
3	FAIR		0.784			POOR	0.784			GOOD		
3	FAIR		0.8			GOOD		GOOD		FAIR		
3	FAIR		0.1			POOR	0.1	FAIR		GOOD		
3	FAIR		0.2			GOOD		GOOD		POOR		

SURFACE_TYPE	GOODNESS_OVERALL		SumOfLENGTH	GOODNESS_RUT		GOODNESS_ROUGHNE		GOODNESS_CRACKIN		GOODNESS_FAULTING		STRUCTURE_TYPE
3	FAIR		1.1			POOR	1.1			FAIR		
3	GOOD		116.4			GOOD		GOOD		GOOD		
3	POOR	1.7	1.7			POOR	1.7			POOR	1.7	
3	POOR	0.2	0.2			POOR	0.2	FAIR		POOR	0.2	
3	POOR	124.5	124.51			POOR	124.509	GOOD		POOR	124.5	
5	FAIR		1.7			POOR	1.7	GOOD				
5	FAIR		6.6			FAIR		GOOD				
5	GOOD		8.3			GOOD		GOOD				
7	FAIR		76.588	FAIR		GOOD		FAIR				
7	FAIR		0.2	FAIR		GOOD						
7	FAIR		39.433	FAIR		FAIR		POOR	39.43			
7	FAIR		144.63	FAIR		FAIR		GOOD				
7	FAIR		117.94	FAIR		FAIR		FAIR				
7	FAIR		2.2	FAIR		FAIR						
7	FAIR		18.974	GOOD		FAIR		FAIR				
7	FAIR		0.4	POOR	0.4	GOOD						
7	FAIR		50.544	GOOD		FAIR		GOOD				
7	FAIR		1.576	GOOD		FAIR		POOR	1.576			
7	FAIR		1.6	GOOD		GOOD						
7	FAIR		20.8	GOOD		GOOD		FAIR				
7	FAIR		1.3	GOOD		GOOD		POOR	1.3			
7	FAIR		13.6	POOR	13.6	GOOD		FAIR				
7	FAIR		20.179	POOR	20.18	FAIR		GOOD				
7	FAIR		4.3	GOOD		POOR	4.3					
7	FAIR		4.104	GOOD		POOR	4.104	FAIR				
7	FAIR		19.956	POOR	19.96	FAIR		FAIR				
7	FAIR		14.192	GOOD		POOR	14.192	GOOD				
7	FAIR		3	FAIR		POOR	3					
7	FAIR		244.66	FAIR		GOOD		GOOD				
7	FAIR		1.5	GOOD		FAIR						
7	FAIR		32.956	FAIR		POOR	32.956	GOOD				
7	FAIR		0.5	POOR	0.5	FAIR						
7	FAIR		24.188	FAIR		GOOD		POOR	24.19			
7	FAIR		17.596	POOR	17.6	GOOD		GOOD				
7	FAIR		42.14	FAIR		POOR	42.14	FAIR				
7	GOOD		230.01	GOOD		GOOD		GOOD				
7	POOR	25.93	25.928	POOR	25.93	FAIR		POOR	25.93			
7	POOR	9.944	9.944	POOR	9.944	POOR	9.944	GOOD				
7	POOR	5.768	5.768	POOR	5.768	GOOD		POOR	5.768			
7	POOR	27.86	27.864	POOR	27.86	POOR	27.864	POOR	27.86			
7	POOR	20.54	20.537	FAIR		POOR	20.537	POOR	20.54			
7	POOR	24.91	24.912	POOR	24.91	POOR	24.912	FAIR				
7	POOR	1.9	1.9	POOR	1.9	POOR	1.9					
7	POOR	0.5	0.5	GOOD		POOR	0.5	POOR	0.5			
		322.8	2917.3		572.1		594.722		278.1		126.4	
		11.07%			19.61%		20.39%		9.53%		4.33%	

Any Questions about Presentation???

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