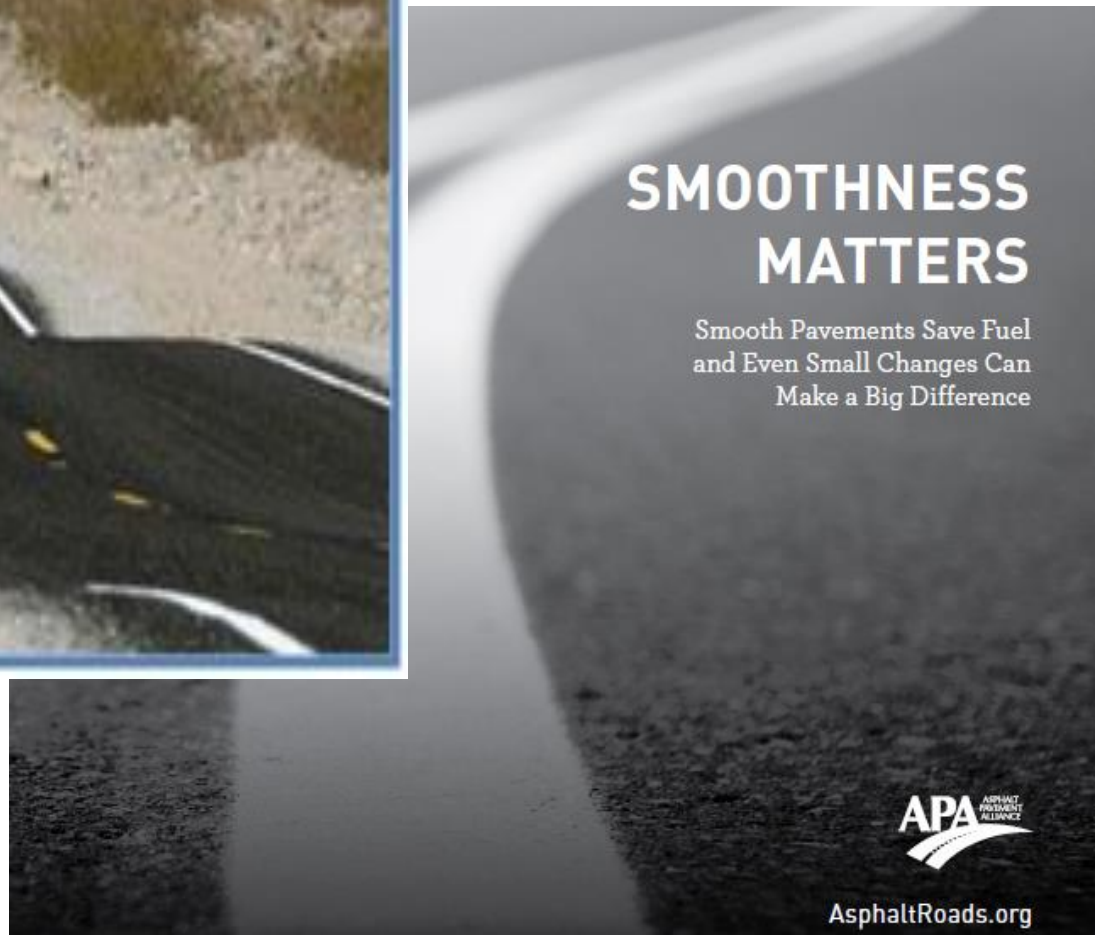
Ride & Density Incentives for 2017

2017 VAA Fall Conference

October 3, 2017

Rob Crandol, VDOT – CO Materials Division

Rideability in 2017



Rideability mileage in 2017*

	Mileage per Spec Type		Ride Spec
District	Incentive Only	Incentive/Disincentive	Total Mileage (miles)
Bristol	41.12	81.87	122.99
Culpeper	30.22	147.59	177.81
Fredericksburg	66.04	75.96	142.00
Hampton Roads	3.27	101.45	104.72
Lynchburg	62.26	55.02	117.28
Northern Virginia	106.91	74.17	181.07
Richmond	51.43	255.62	307.05
Salem	47.76	79.31	127.06
Staunton	95.41	99.36	194.77
Total	**504.4**	**970.3**	**1474.7**

With some carryover from 2016 included in these figures

Rideability in 2017 – mileage analyzed to date

	Mileage Paved per Spec Type		Ride Spec
District	Incentive Only	Incentive/Disincentive	Total Paved Length (miles)
Bristol	0	3.14	3.14
Culpeper	1.42	59.45	60.87
Fredericksburg	69.87	70.75	140.62
Hampton Roads	0	24.80	24.80
Lynchburg	23.64	16.79	40.43
Northern Virginia	26.95	29.73	56.68
Richmond	10.89	210.27	221.16
Salem	4.14	17.12	21.26
Staunton	6.72	40.40	47.12
Total	**143.6** **(28%)**	**472.4** **(49%)**	**616.0** **(42%)**

Rideability in 2017 – mileage analyzed to date

	Incentive Only		Incentive/Disincentive	
District	Lane Miles with No Bonus	Lane Miles with Bonus	Lane Miles with Penalty	Lane Miles with Bonus
Bristol	0	0	3.14	
Culpeper	0	1.42	9.70	49.75
Fredericksburg	22.79	47.08	18.02	52.73
Hampton Roads	0	0	8.55	16.25
Lynchburg	0	23.64	0.86	15.92
Northern Virginia	2.79	24.16	11.59	18.14
Richmond	0	10.89	31.13	179.14
Salem	0	4.14	12.11	5.01
Staunton	3.46	3.26	0	40.40
Total	**29.04** (20%)	**114.59** (80%)	**95.11** (20%)	**377.34** (80%)

Rideability in 2017 – mileage analyzed to date

	Pay Adjustment per Spec Type		Total
District	Incentive Only	Incentive/Disincentive	Pay Adjustment
Bristol	$ 0	-$9,864.14	-$9,864.14
Culpeper	$900.90	$98,009.10	$98,910.00
Fredericksburg	$56,666.54	$76,579.22	$133,245.76
Hampton Roads	$ 0	$31,171.28	$31,171.28
Lynchburg	$63,882.14	$57,837.14	$121,719.27
Northern Virginia	$16,354.73	$109,991.08	$126,345.81
Richmond	$9,474.92	$239,262.90	$248,737.82
Salem	$7,762.55	-$56,671.70	-$48,909.15
Staunton	$10,627.58	$297,394.70	$308,022.28
Total	**$165,669.36**	**$843,709.57**	**$1,009,378.92**

Density in 2017

Density is Important

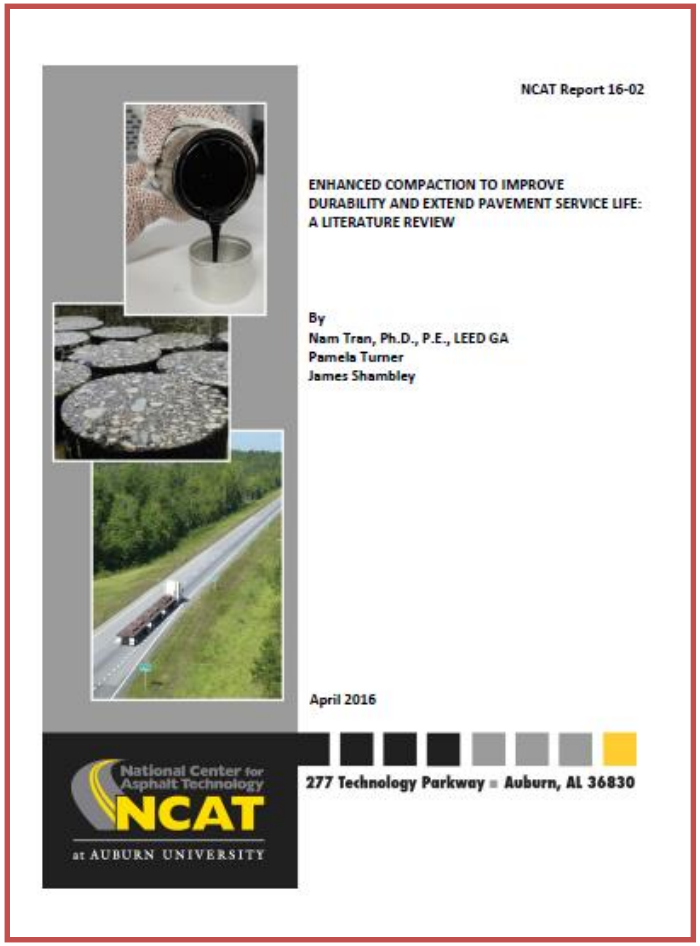
- Hughes, C.S., "Compaction of Asphalt Pavement." NCHRP Synthesis 152, Washington, D.C., 1989.
  - Compaction is the **single most important factor** that affects pavement performance in terms of durability, fatigue life, resistance to deformation, strength and moisture damage.
- Geller, M. Synthesis 152
  - "Compaction is the **most economical** alternative for achieving an increase in the life expectancy of new and rehabilitated pavement."

- Brown, E.R., "Density of Asphalt Concrete – How Much is Needed?" NCAT Report 90-03. 1990.
  - "The amount of voids in an asphalt mixture is probably the **single most important factor** that affects performance throughout the life of an asphalt pavement. The voids are primarily controlled by asphalt content, compactive effort during construction, and additional compaction under traffic."

NCAT Report 16-02 (2016)

"A **1% decrease in air voids** was estimated to:

- <u>improve fatigue</u> performance by 8.2 and 43.8%
- <u>improve the rutting</u> resistance by 7.3 to 66.3%
- **<u>extend the service life</u> by conservatively 10%**."


NCAT Report 16-02

ENHANCED COMPACTION TO IMPROVE DURABILITY AND EXTEND PAVEMENT SERVICE LIFE: A LITERATURE REVIEW

By
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April 2016

National Center for Asphalt Technology
NCAT
at AUBURN UNIVERSITY

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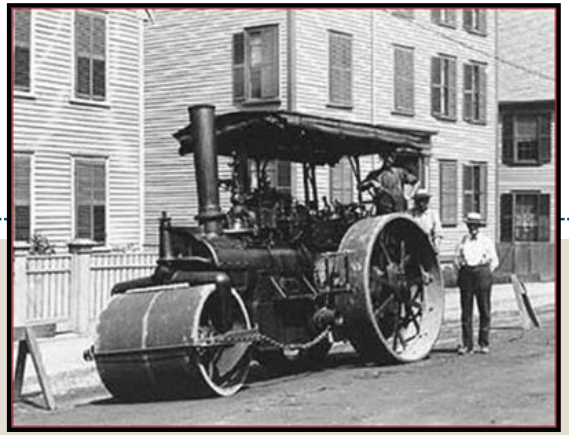
http://eng.auburn.edu/research/centers/ncat/files/technical-reports/rep16-02.pdf

Enhanced Durability Through Increased Density



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ASPHALT RESEARCH ADVISORY COMMITTEE
APRIL 19, 2017

VDOT Virginia Department of Transportation

VTRC Virginia Transportation Research Council

Overall Objective

Ultimately,

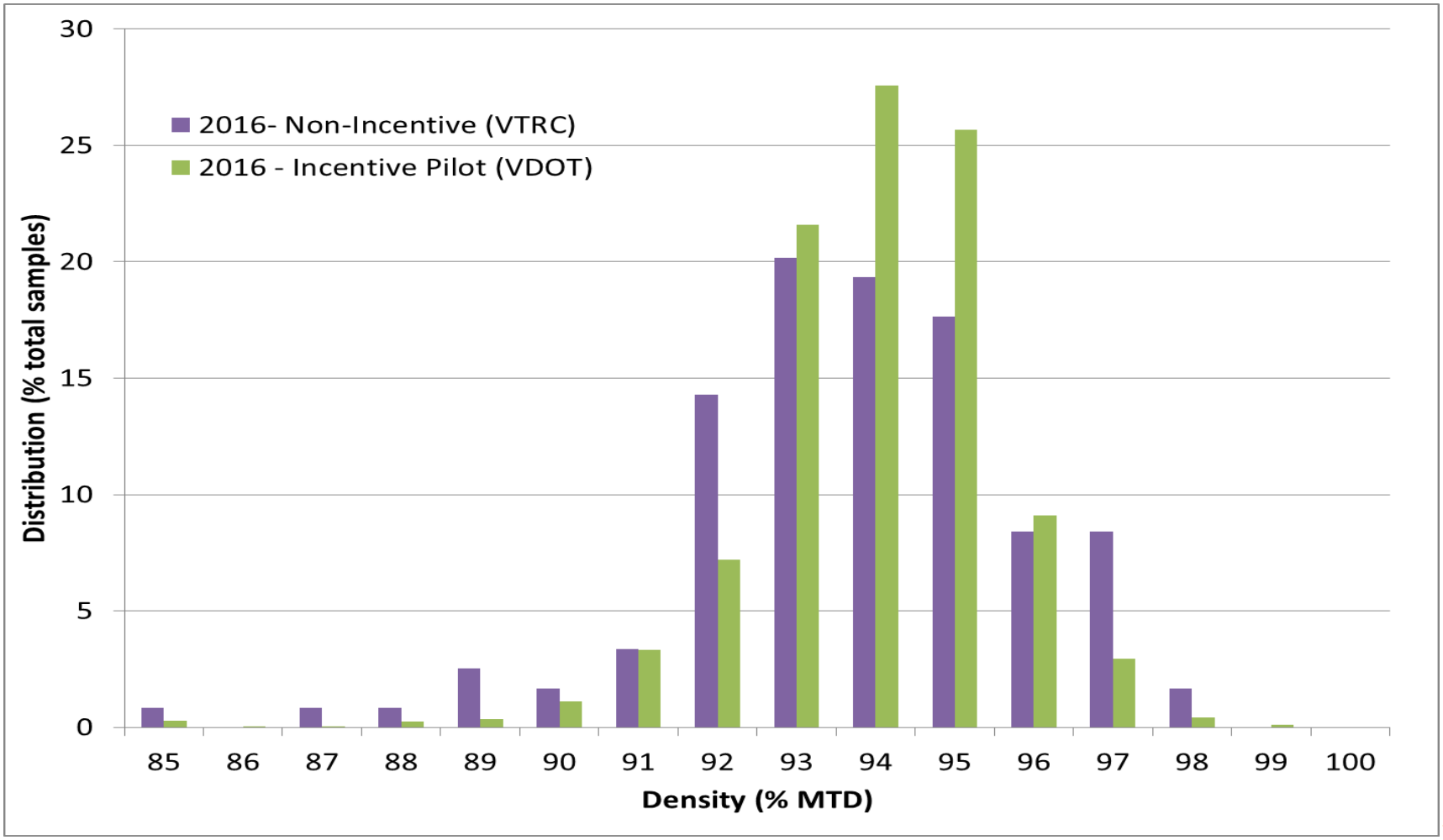
achieving the in-place asphalt pavement density that results in the highest asphalt pavement performance.

Density – pilots in 2016

- Objective:
  - Critical review of VDOT's acceptance procedures for plant mix density
- Scope:
  - Dense-graded surface mixes - 2016
  - Statewide resurfacing schedules
  - Statewide "quality incentive" projects (13 locations)

Status as at the end of 2016 (all data collected):

- ***Convergence*** **between pilot and "non-pilot" density**
- **A little *higher average density*, overall**



Density in 2017

Density: Methods for acceptance and payment of in-place density will be determined according to Table III-2A, and performed as described herein.

TABLE III-2A
Density Acceptance Methods

Density Acceptance Method to be used	Route type	Traffic Group	Minimum roadway pavement width
Method 'A' (plugs or cores)	• All intersate & limited access primary • Primary & secondary with minimum traffic & width	XIII and higher (>=5,000 ADT)	20'
Method 'B' (nuclear guage)	• Primary & secondary not meeting minimum traffic & width	XII and lower (< 5,000 ADT)	n/a

Density in 2017

- Data analysis to be performed at the end of 2017 season:
  - Average and range of density achieved.
  - Amount of bonus(es) possible & amount paid for “Method A” routes
  - Value added ?: incentive ($) vs. improvement

Virginia Department of Transportation

QUESTIONS ?