ROUNDTABLE MEETING 2017

ATD Data & Research Priorities

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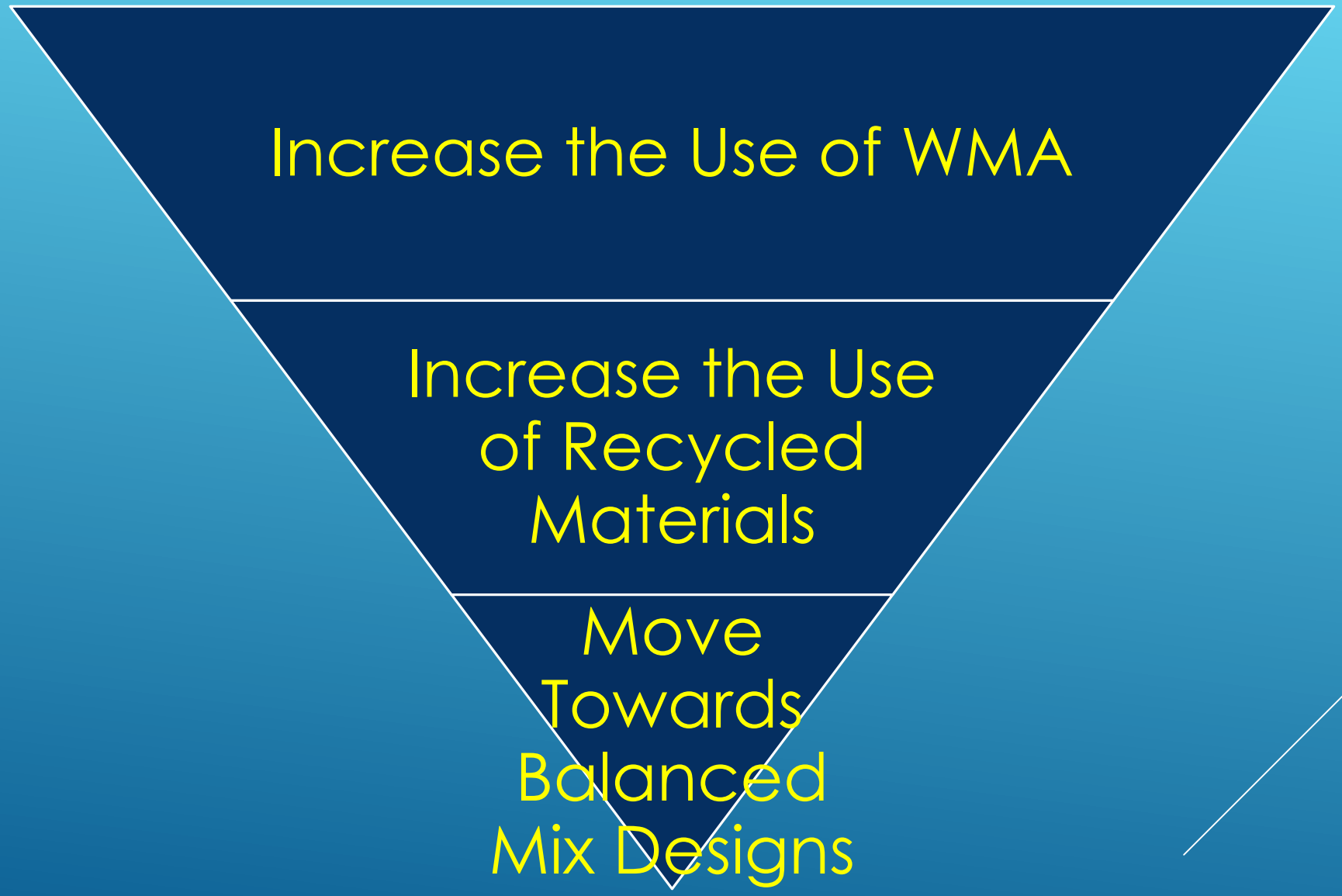
ASPHALT DIVISION

- More than 200 years of combined experience
- Deals with quality assurance of entire state
- Helps local agencies with specifications
- Verify and approves new products
- Sponsor research projects and implement the recommendations
- Works with asphalt industry and other local governments

ATD Priorities



WHY WMA?

Compaction aid

- Helps while paving at lower temperatures
- Helps for long hauling distances

Helps Environment

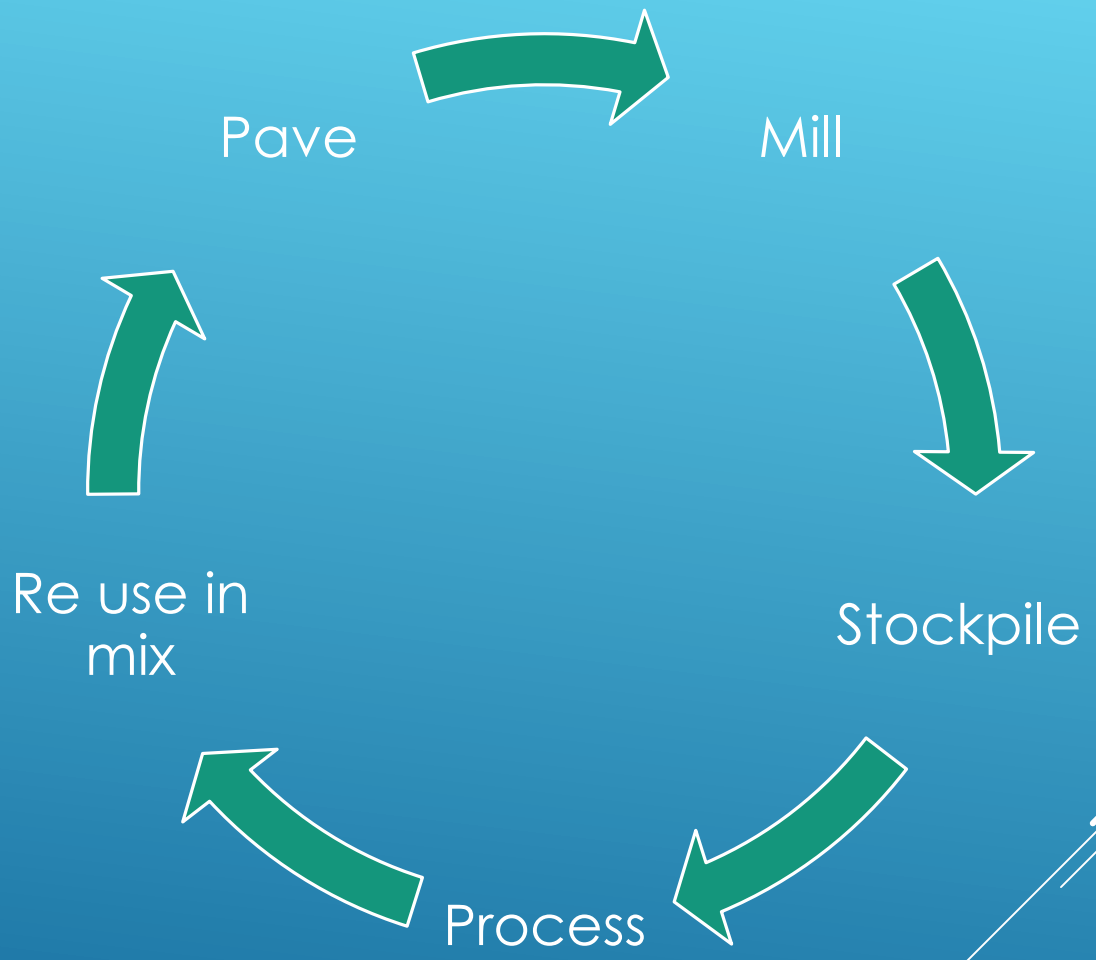
- Reduce emissions
- Worker friendly and helps to use more recycled material

Performance

- It helps to decrease the aging of binder
- It's a part of FHWA EDC program – it increases durability

RECYCLED MATERIALS

- Helps environment
- Reduce cost
- Does not reduce performance if use it right
- Specs set up for usage



BALANCED MIX DESIGN

- Cracking is predominant in Maryland
- It could be because of dry mixes
- Needs a study to optimize asphalt content for performance
- Performance study may require at mix design level

Research Priorities

Thin lift overlays

Awaiting funding approval

- Study helps to compare conventional paver vs special paver

Balanced mix designs

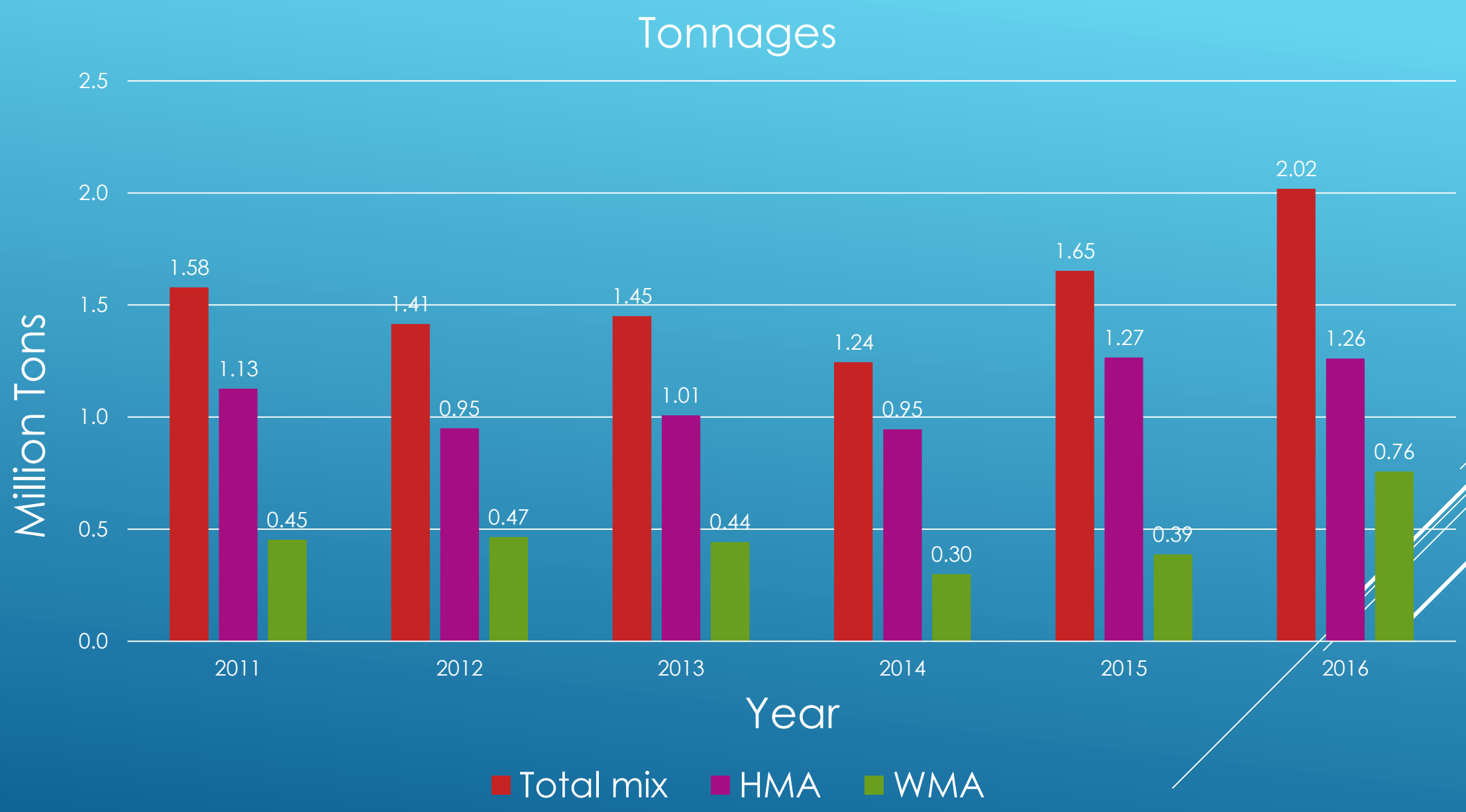
Funding approved for primary study

- To see the difference in performance of conventional mixes vs balanced mixes

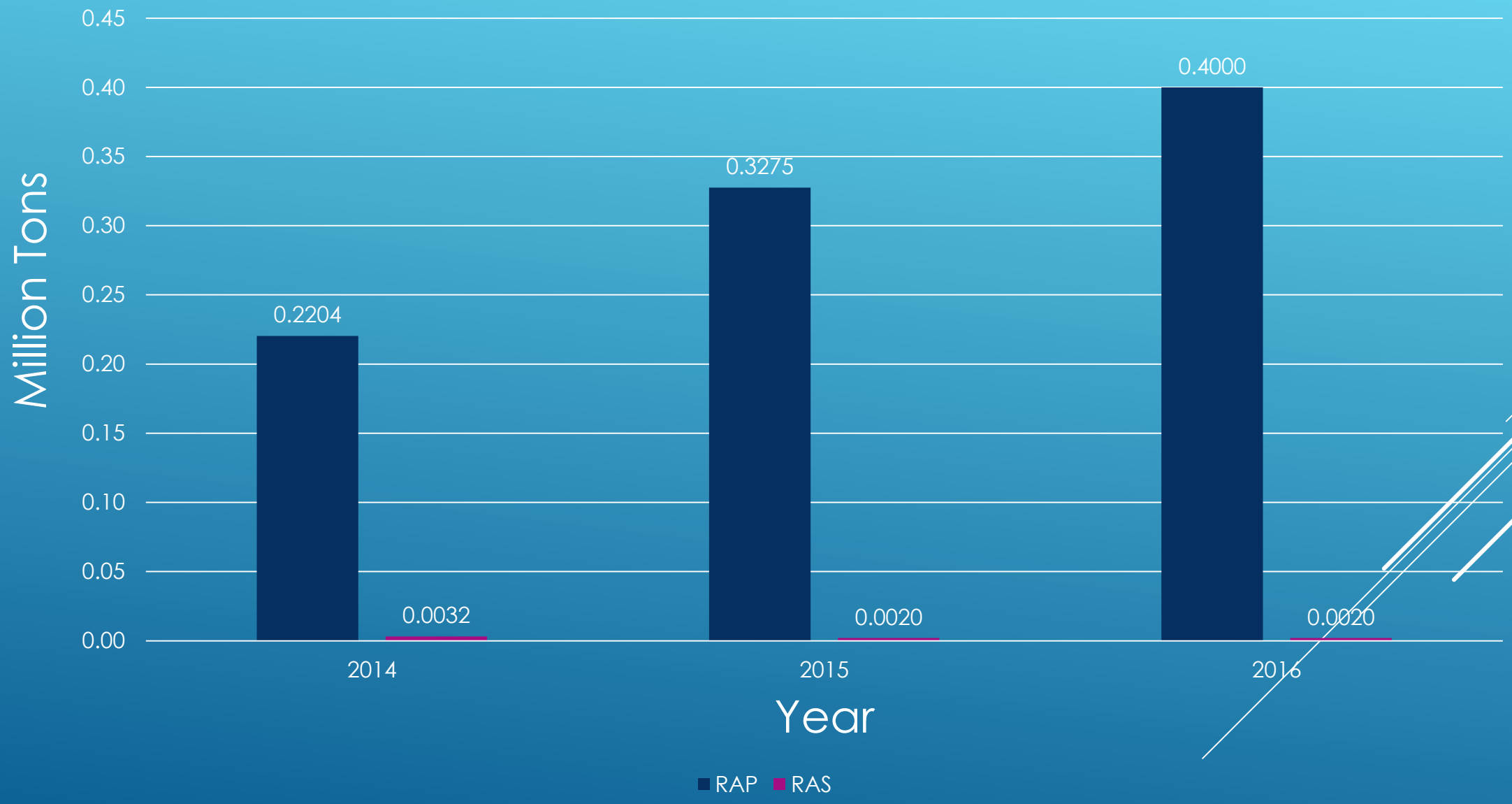
Intelligent compaction

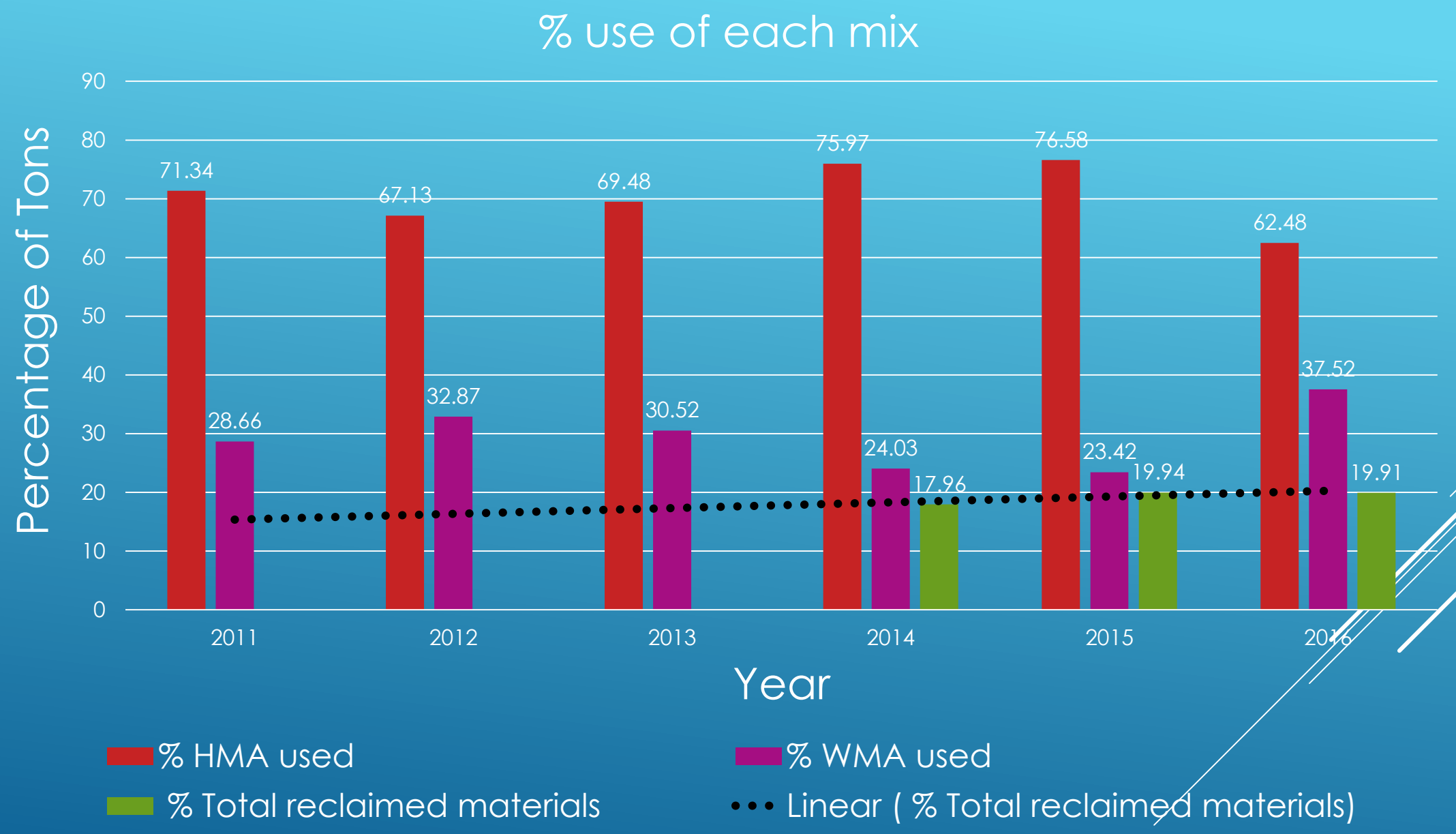
Working with FHWA to do a trial project

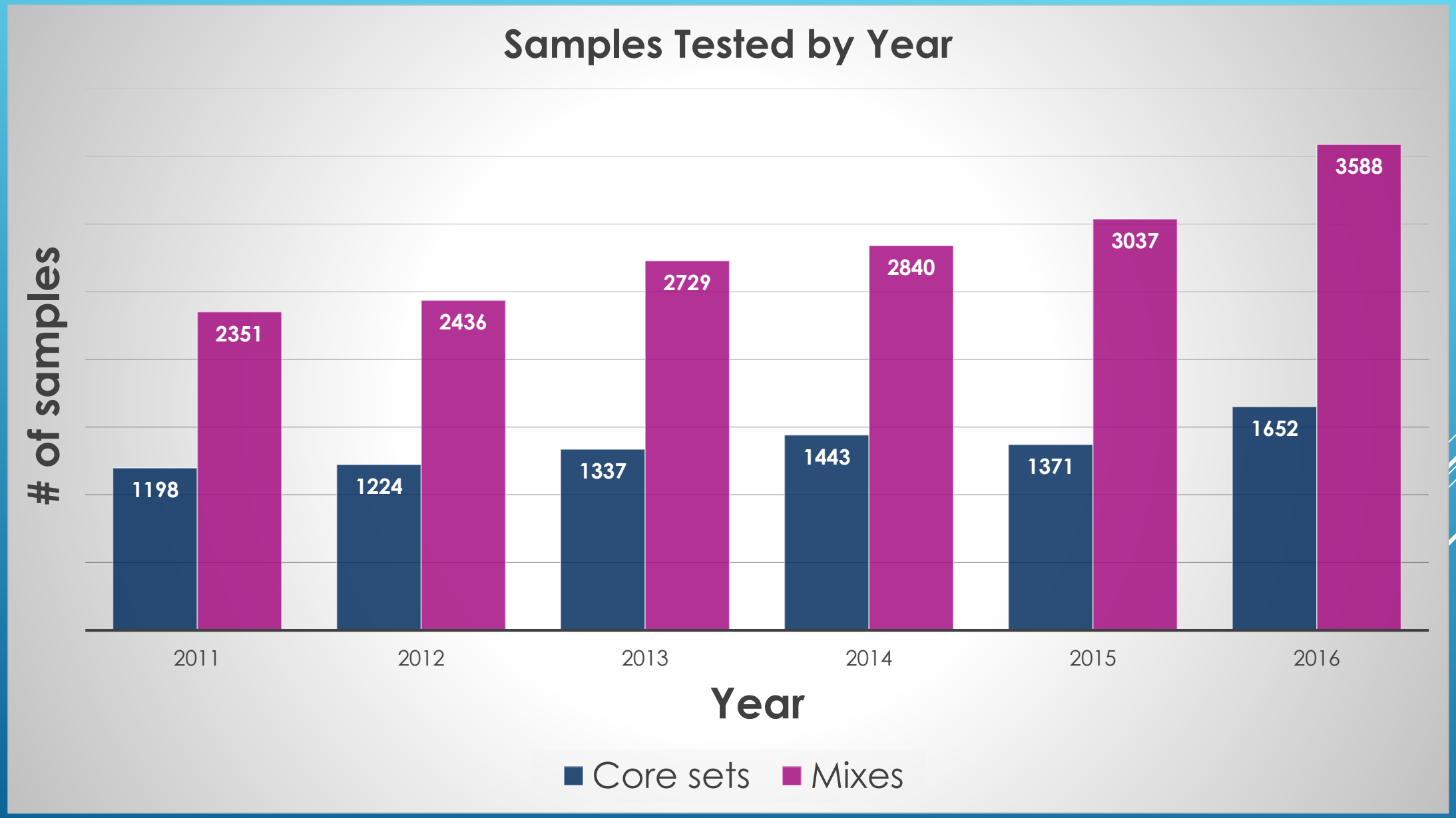
- Helps monitoring the consistency of paving operation throughout the length of the project

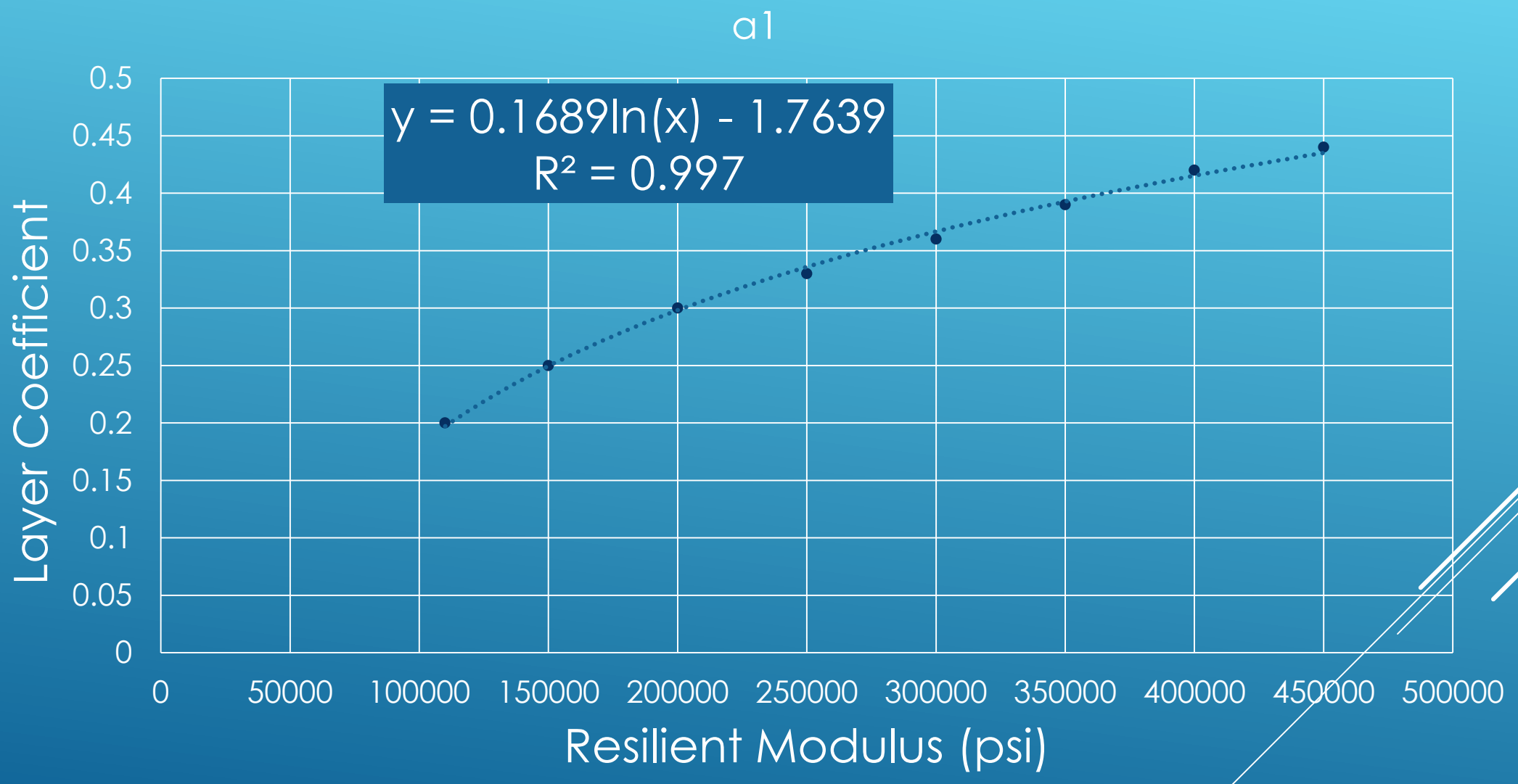

Tonnages
2.5
2.0
1.5
1.0
0.5
0.0
Million Tons
1.58
1.13
0.45
1.41
0.95
0.47
1.45
1.01
0.44
1.24
0.95
0.30
1.65
1.27
0.39
2.02
1.26
0.76
2011
2012
2013
2014
2015
2016
Year
Total mix
HMA
WMA

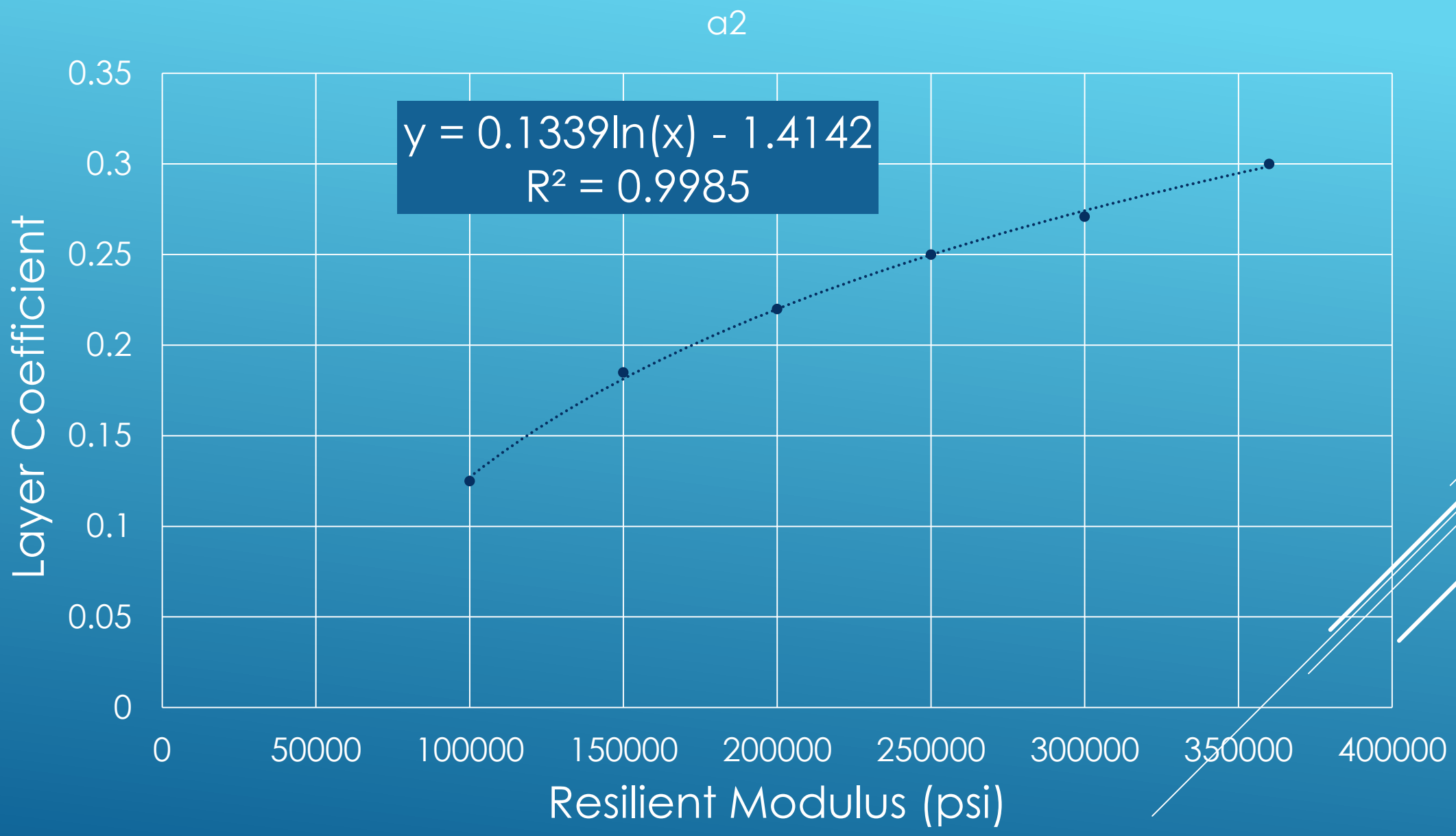
RAP/RAS tonnage

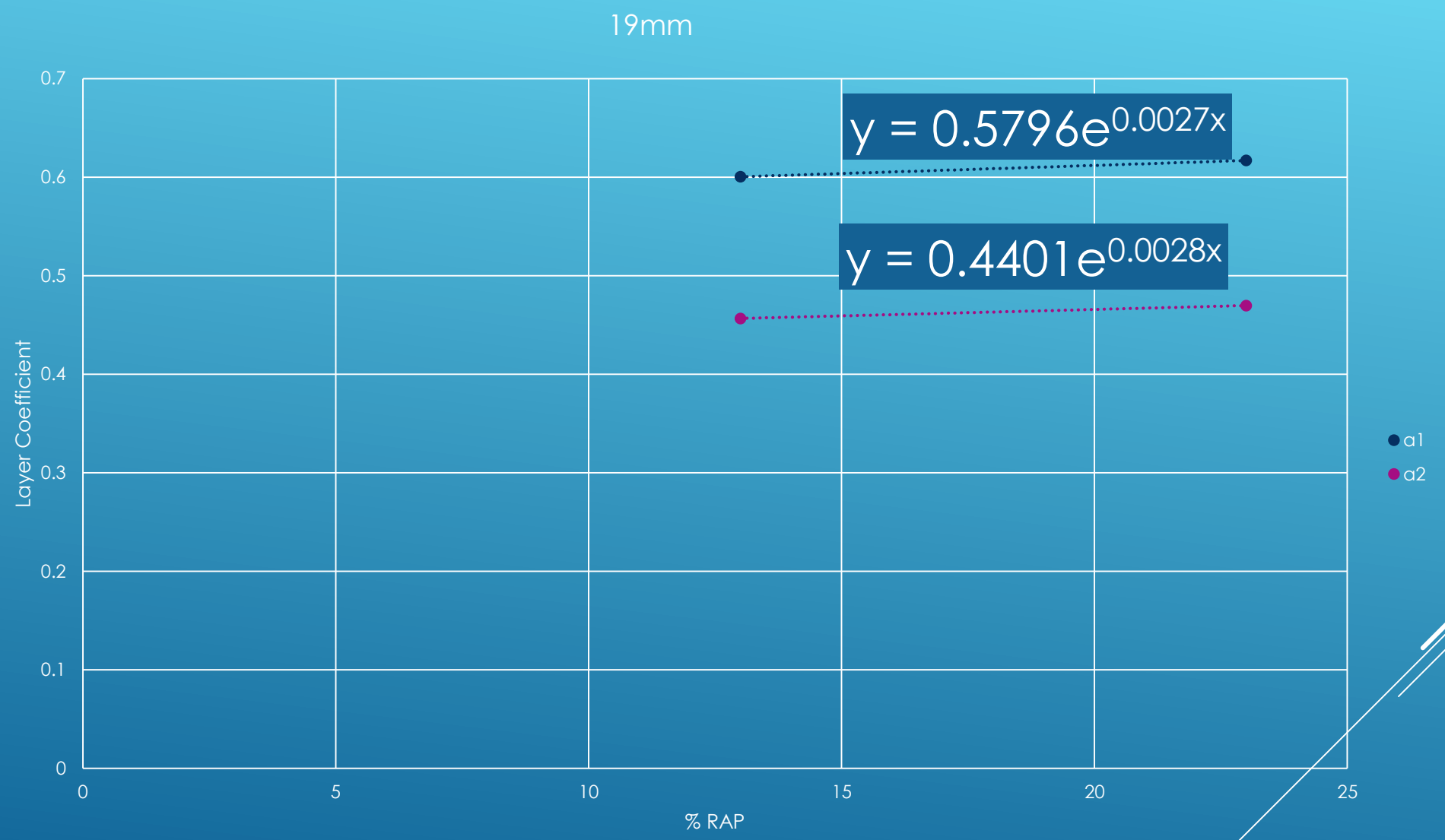



% use of each mix
Percentage of Tons
90
80
70
60
50
40
30
20
10
0
71.34
28.66
67.13
32.87
69.48
30.52
75.97
24.03
17.96
76.58
23.42
19.94
62.48
37.52
19.91
2011
2012
2013
2014
2015
2016
Year
% HMA used
% WMA used
% Total reclaimed materials
Linear (% Total reclaimed materials)

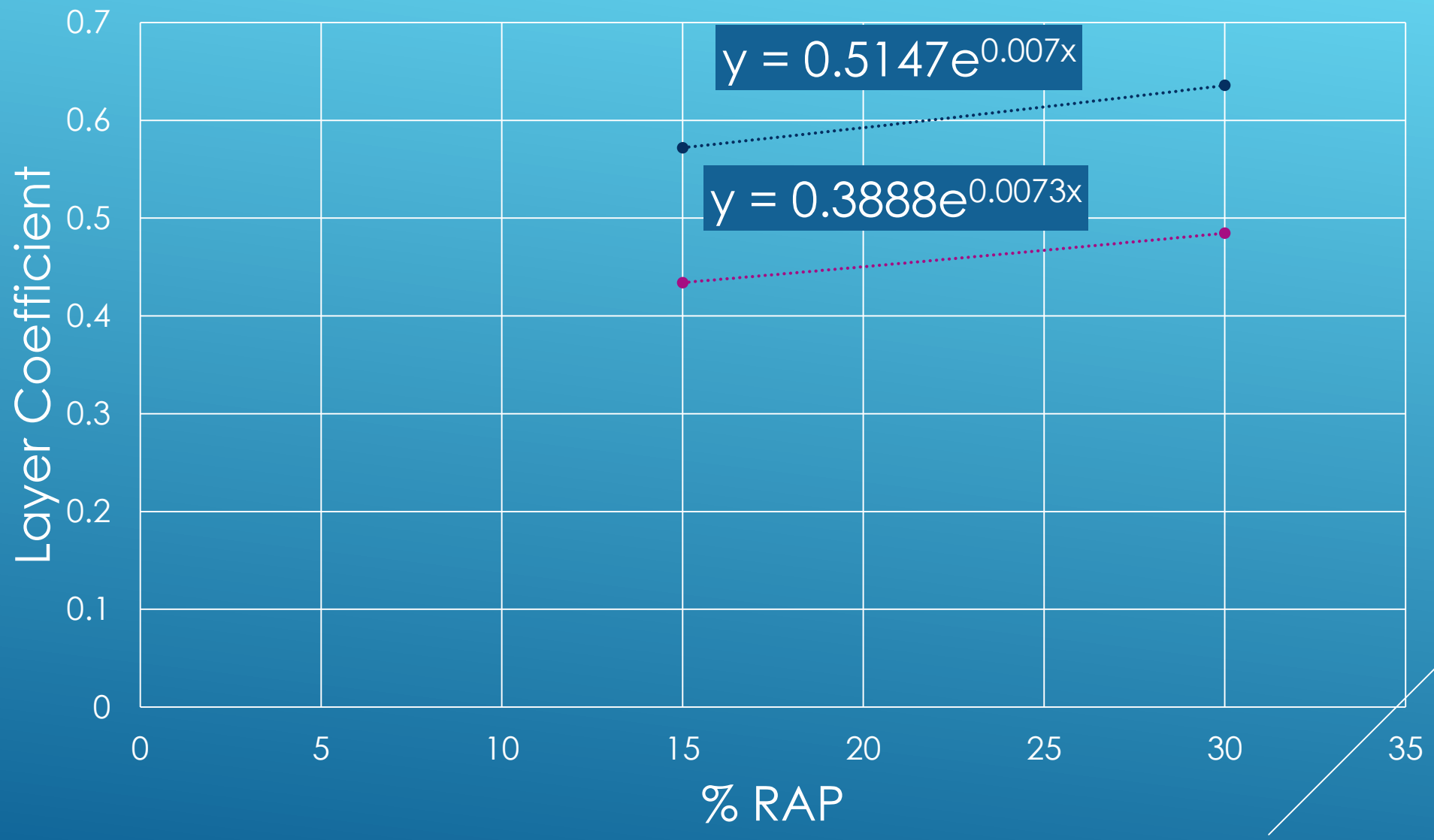

Samples Tested by Year
# of samples
1198
2351
1224
2436
1337
2729
1443
2840
1371
3037
1652
3588
2011
2012
2013
2014
2015
2016
Year
Core sets
Mixes


a1
y = 0.1689ln(x) - 1.7639
R² = 0.997
Layer Coefficient
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
50000
100000
150000
200000
250000
300000
350000
400000
450000
500000
Resilient Modulus (psi)

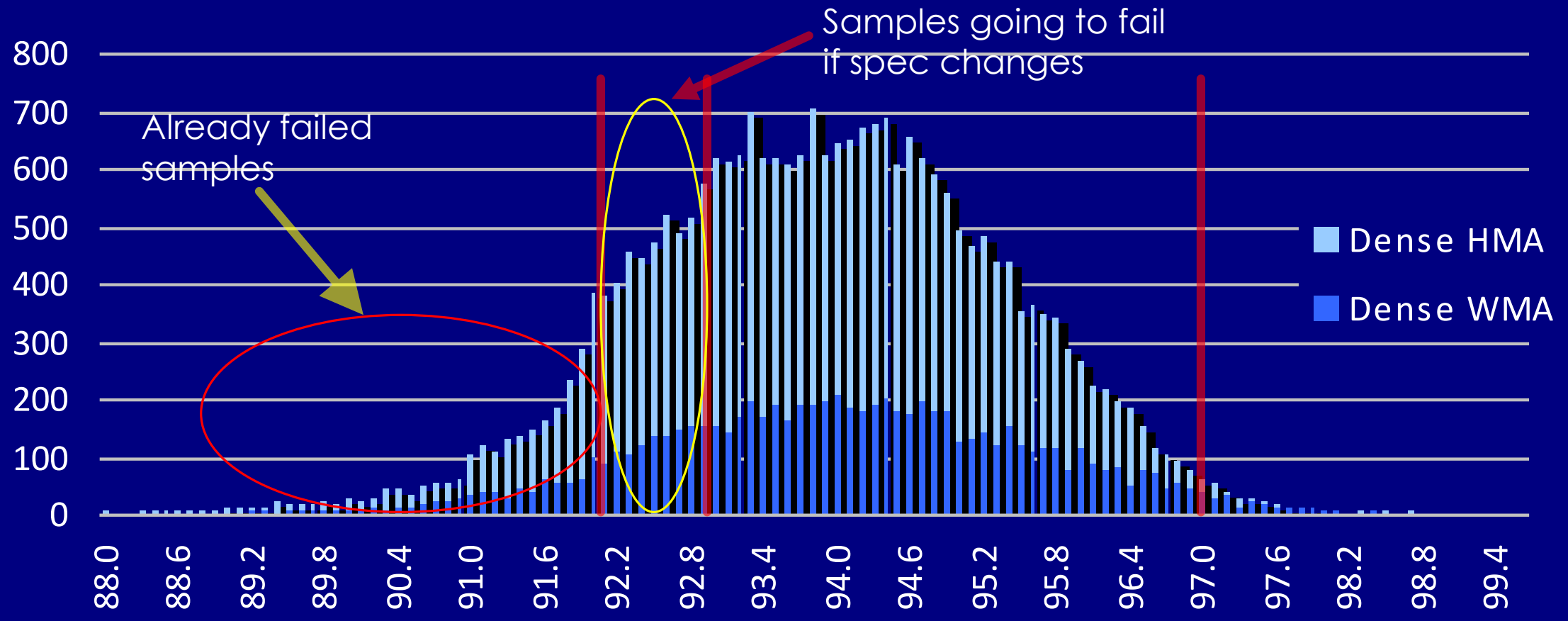

a2
y = 0.1339ln(x) - 1.4142
R² = 0.9985
Layer Coefficient
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
50000
100000
150000
200000
250000
300000
350000
400000
Resilient Modulus (psi)


19mm
y = 0.5796e^0.0027x
y = 0.4401e^0.0028x
Layer Coefficient
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15
20
25
% RAP
a1
a2

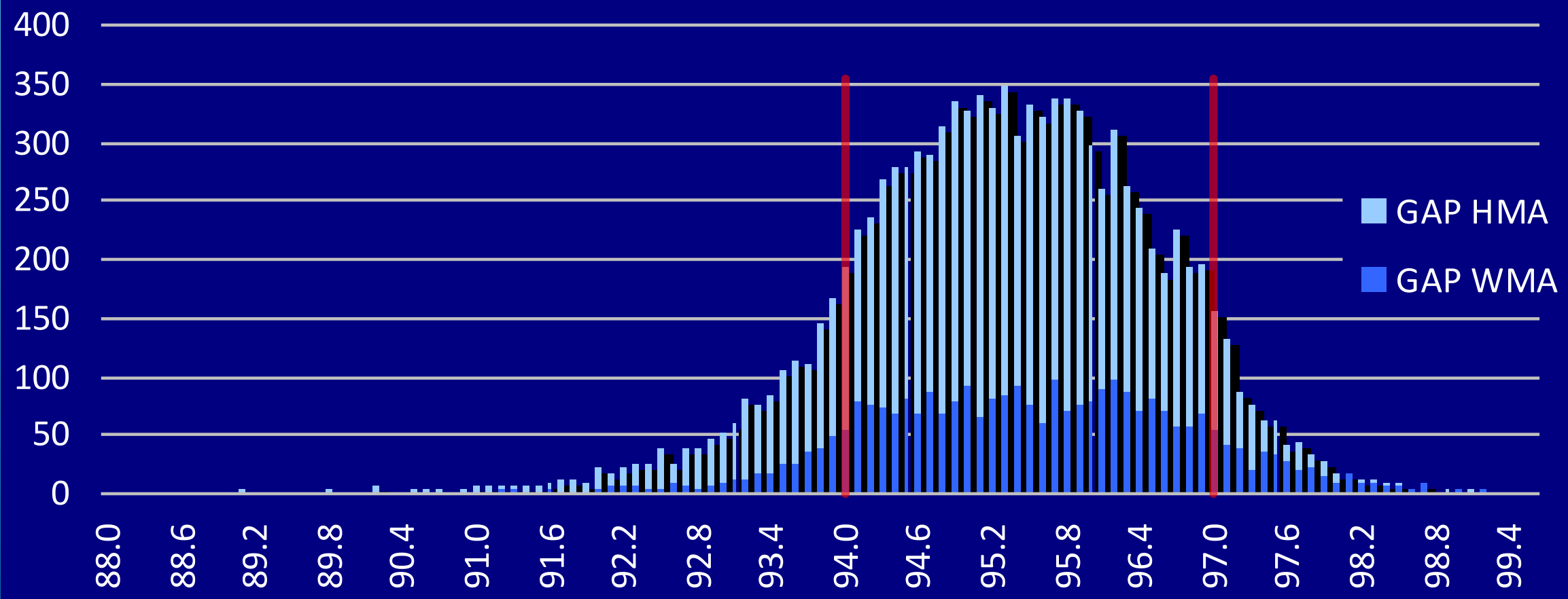
9.5mm mix


y = 0.5147e^0.007x
y = 0.3888e^0.0073x
Layer Coefficient
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15
20
25
30
35
% RAP
a1
a2

Dense Graded Mix Density by Method



GAP Graded Mix Density by Method



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