

NEAUP

Superpave
for
Local Government
and
Commercial Applications

10-26-00

Bike paths...





Local Roads



Local Roads



Cul-de-sac

Truck Parking



Rutted
Intersections



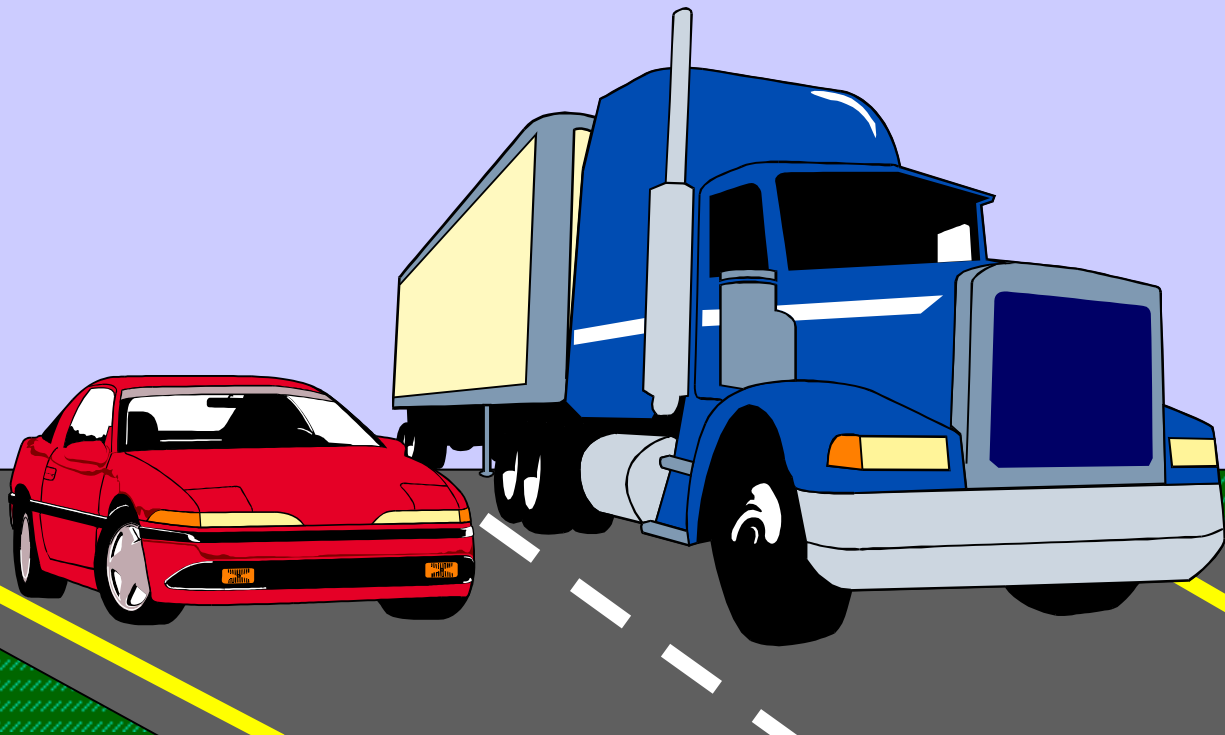
For each
there is a
Superpave Mix



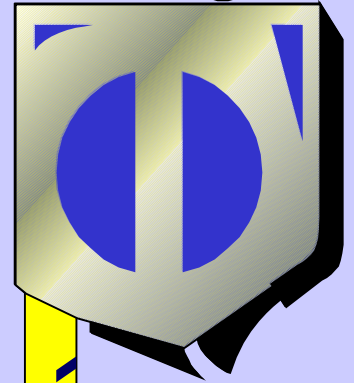
You need to know:

- *Compaction Level*
- *Mix Size*
- *Binder Grade*

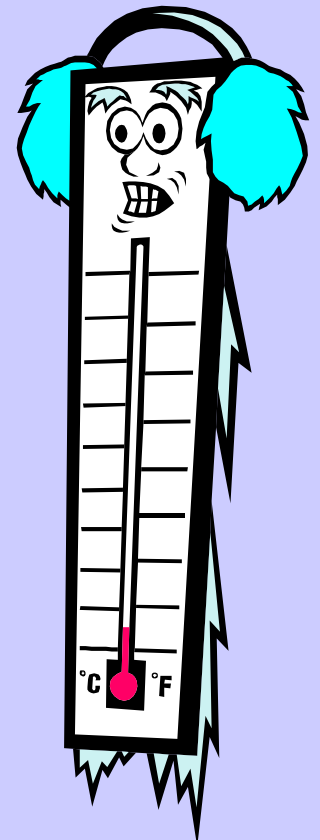
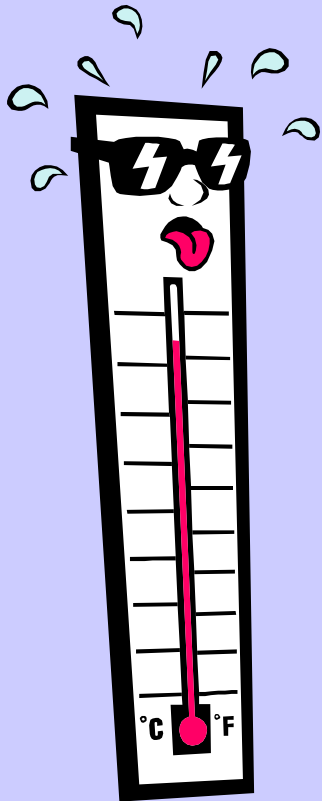
Compaction level is a function
of traffic and depth of layer



Mix size is determined
by thickness of layer



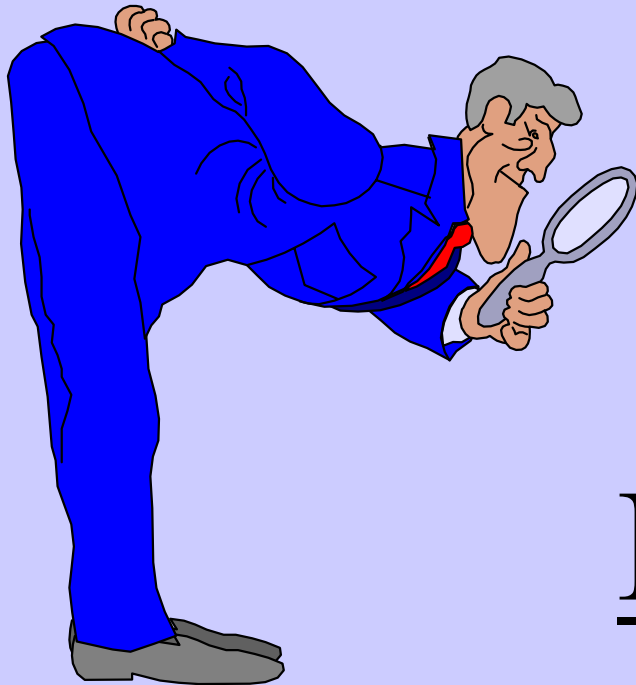
Binder Grade is a function of environment and traffic level



Why does Superpave make a
difference?



There are...



More Options...

How Superpave is Different...

Traditional Maryland Method

- SC, SF, BC, BF, Gap Graded
- 3 surface options, 2 base options

Superpave Method - 71 options

- 4.75, 9.5, 12.5, 19.0, 25.0, 37.5
- PG 64-22, PG 70-22, PG 76-22, PG 70-22 P
- ESAL Category 1, 2, 3, 4 or 5
- 47 surface options, 24 base options

Selection Process

- 1 - Select Compaction Level
- 2 - Determine Pavement Thickness
- 3 - Select Mix
- 4 - Select Appropriate Binder
- 5 - Prepare Specifications

Select Compaction Level

Option 1

Select Category Based on Visual Observation

| < 0.3 | 0.3 to < 3.0 | 3.0 to < 10.0 |
|-------------|-----------------|----------------|
| Local Roads | Collector Roads | Arterial Roads |

Select Compaction Level

Option 2

Calculate 20 year Cumulative ESALs

Input:

AADT - AADT

% Trucks - PT

Truck Factor - TF

Lane Factor - LF

Dir Distribution - DD

Growth Rate - GR

20 year Cumulative ESALs

$AADT(PT)(TF)(LF)(365)(DD)(GF)$

where:

$$GF = ((1+GR)^{20}-1) / GR$$

Mix Selection

| Mix | Application |
|------|---------------------------------------|
| 4.75 | Surface Treatment, Rut Fill |
| 9.5 | Surface Course, Leveling |
| 12.5 | Surface Course, Thin Patch |
| 19.0 | Surface Course, Base Course, Patching |
| 25.0 | Base Course, Deep Patching |
| 37.5 | Base Course |

Superpave Mix Selection

4.75



9.5



12.5



19.0



25.0



37.5



Surface Course Selection

Mixes - 4.75, 9.5, 12.5 and 19.0 mm

| | Lift Thickness (inches) | | |
|------|-------------------------|------|------|
| Mix | Min | Pref | Max |
| 4.75 | 0.5 | 0.75 | 0.75 |
| 9.5 | 1.0 | 1.5 | 2.0 |
| 12.5 | 1.5 | 2.0 | 2.5 |
| 19.0 | 2.0 | 2.5 | 3.5 |

Wearing (Top) Course Selection

High Polish Stone

- AADT > 15,000
- Speed > 55 mph

Dense-Graded Mix

- AADT < 15,000 or
- Speed < 55 mph

Gap-Graded Mix

- AADT > 20,000
- Speed > 55 mph

Base Course Selection

Mixes - 19.0, 25.0 or 37.5 mm


| Mix | Lift Thickness (inches) | | |
|------|-------------------------|------|-----|
| | Min | Pref | Max |
| 19.0 | 2.0 | 2.5 | 3.0 |
| 25.0 | 3.0 | 3.5 | 4.0 |
| 37.5 | 4.0 | 4.5 | 5.0 |

Knock down 1 ESAL level for depths < 100 mm

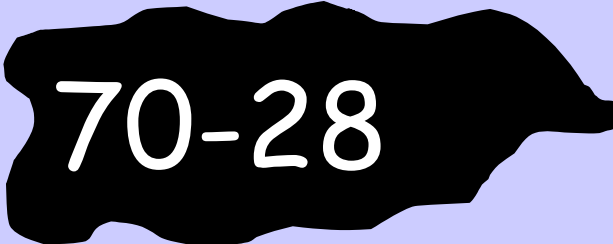
Select Binder

- 1) Identify if Rutting Exists
- 2) Identify Traffic Loading Rate
 - Standing - avg. < 12 mph
 - Slow - avg. 12 to 43 mph
 - Standard - avg. > 43 mph
- 3) Define Quantity of HMA
 - < 1,000 tons
 - > 1,000 tons

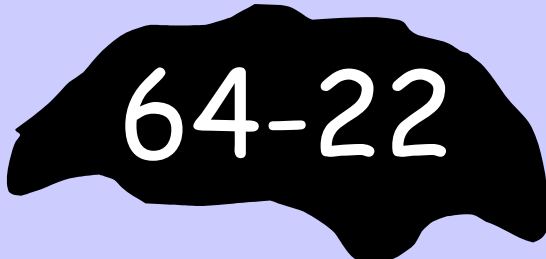
Superpave Binder Selection




58-28



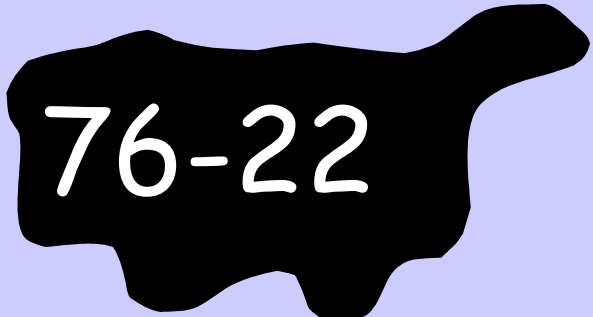
70-28



64-22

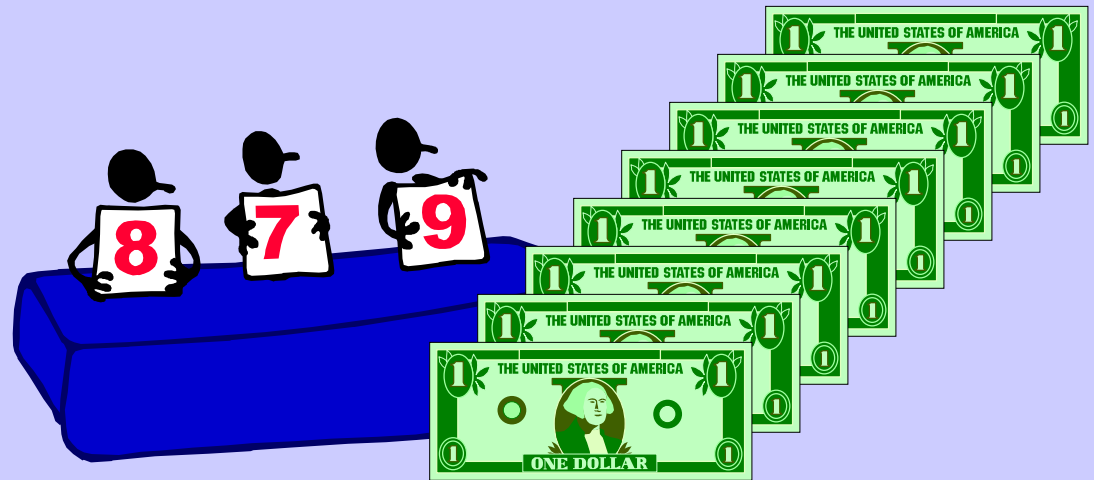
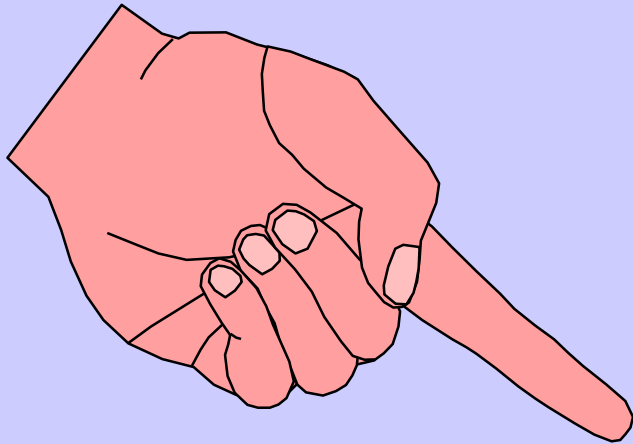


70-22



76-22

Remember !



Aggregate quality effects
PERFORMANCE and PRICE

!!

Aggregate Consensus Properties

Estimated
Design
Traffic
Level
(Million
ESALs)²

<0.3

| Coarse Aggregate Angularity | | Fine Aggregate Angularity | | Sand Equivalent Value | Flat and Elongated |
|-----------------------------|------------|---------------------------|----------|-----------------------|--------------------|
| ≤100 mm | >100 mm | ≤100 mm | >100 mm | All Mixtures | All Mixtures |
| 55/- | -/- | - | - | 40 | - |



Aggregate Consensus Properties

Estimated
Design
Traffic
Level
(Million
ESALs)²

0.3 - 3

Coarse
Aggregate
Angularity

≤100 mm

>100 mm

75/-

50/-

Fine
Aggregate
Angularity

≤100 mm

>100 mm

40

40

Sand
Equivalent
Value

All Mixtures

40

Flat
and
Elongated

All Mixtures

<10%



Aggregate Consensus Properties

Estimated
Design
Traffic
Level
(Million
ESALs)²

Coarse
Aggregate
Angularity

Fine
Aggregate
Angularity

Sand
Equivalent
Value

Flat
and
Elongated

3 - 10

85/80

60/-

45

40

45

<10%

10 - 30

95/90

80/75

45

40

45

<10%



Aggregate Consensus Properties

Estimated
Design
Traffic
Level
(Million
ESALs)²

Coarse
Aggregate
Angularity

≤100 mm

>100 mm

Fine
Aggregate
Angularity

≤100 mm

>100 mm

Sand
Equivalent
Value

All Mixtures

Flat
and
Elongated

All Mixtures

>30.0

100/100

100/100

45

45

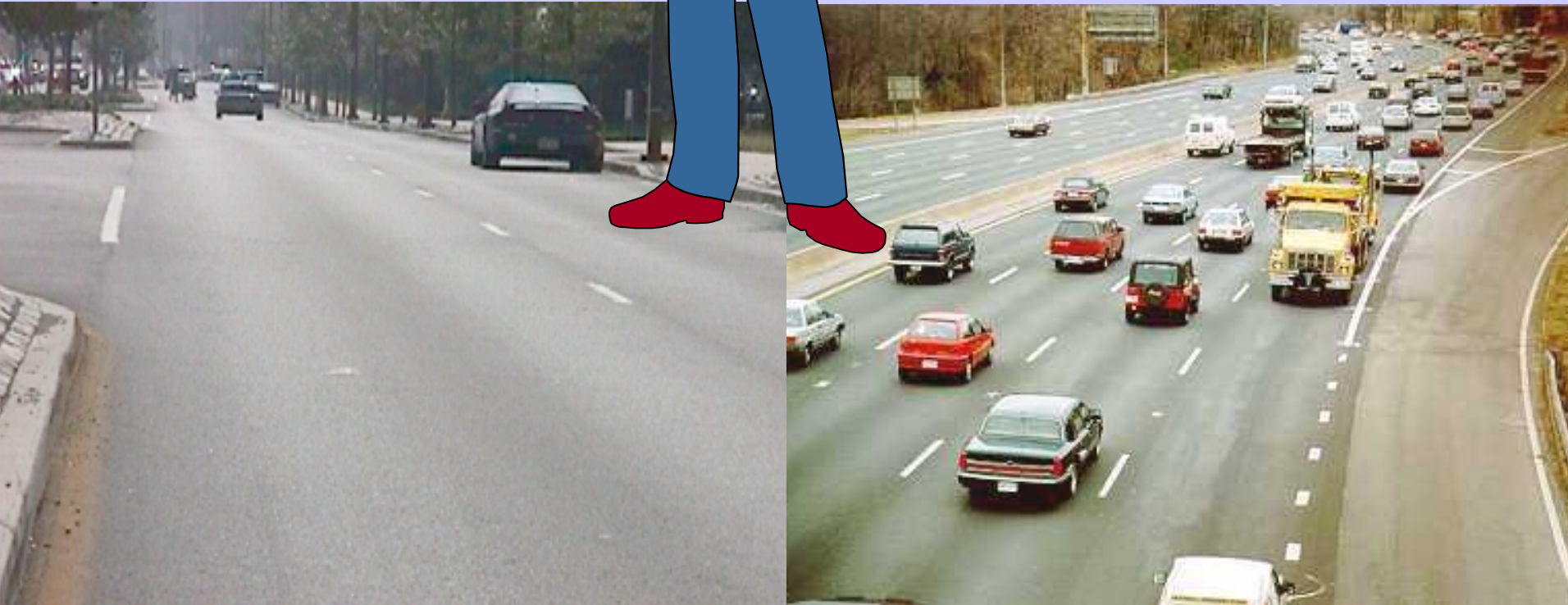
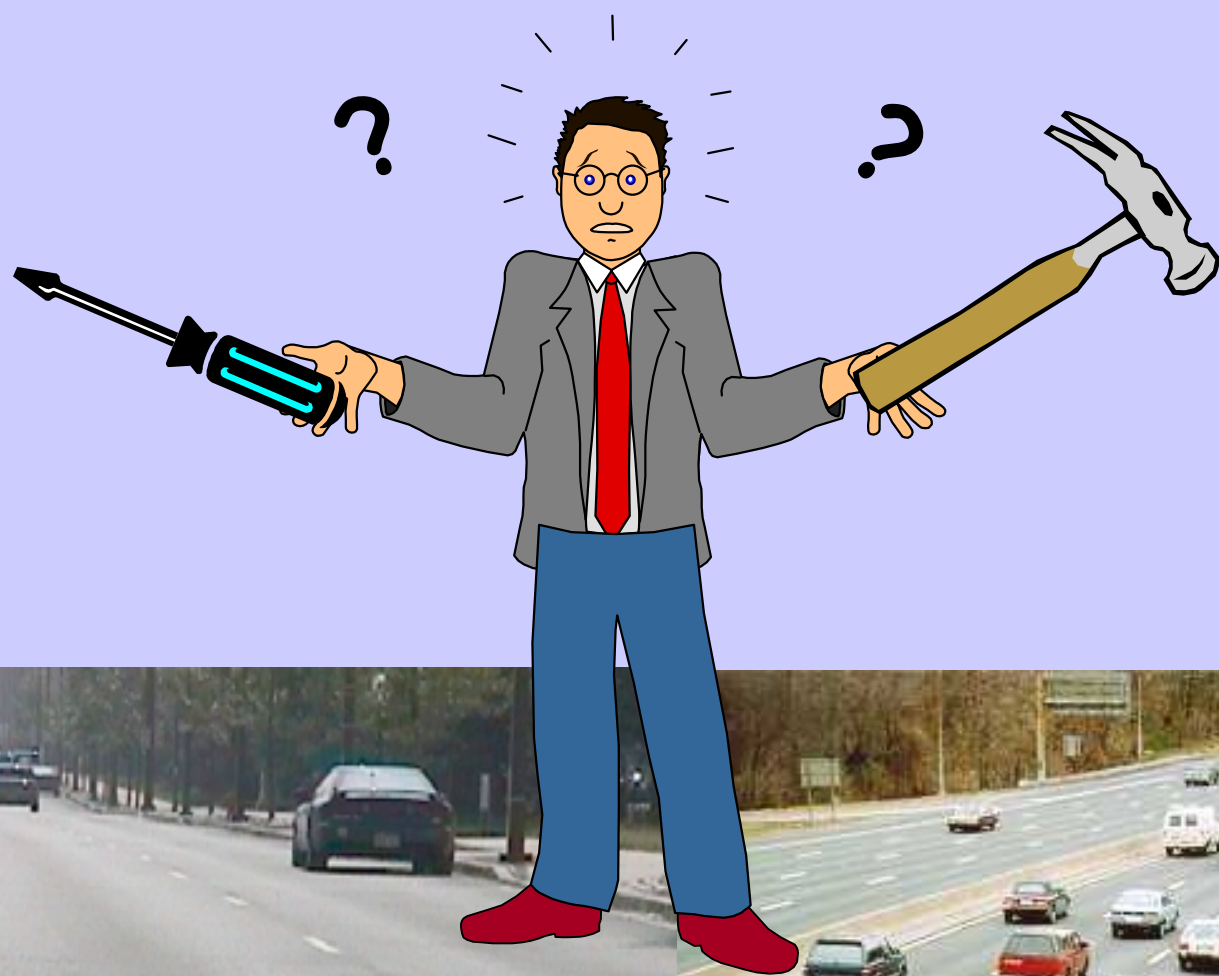
50

<10%



Design Constraints/Guidelines

- Limit to 3 mixes per contract
- Limit to two binders per contract
- Limit 1 ESAL category per mix for quantities < 1,000 tons
- Limit drop off to 2 inches maximum
- Recommend binders requiring polymer to > 1,000 tons of mix
- Potential need for MTD for coarse mixes
- Place surface on 19 mm or less



N 50



Choices

4.75 mm

PG 64-22

9.5 mm

PG 70-22

12.5 mm

N 75



Choices

9.5 mm

PG 64-22

12.5 mm

PG 70-22

19.0 mm

N 100



Choices

9.5 mm

PG 64-22

12.5 mm

PG 70-22

19.0 mm

PG 76-22

Superpave Toolbox



Environment

ESALs

N_{design}

Crushed Faces

Performance
Grades

Nominal Sizes

The key to success is
knowing how to use
the tools...



Questions...

