$18 Million Benefits of Using Ground Tire Rubber In Asphalt: Eleven Years of Success

George Way, P.E.
Arizona DOT
Flagstaff I-40

Elev. 2133 Meters
254 cm of snow
Lowest Temp. -31 C
I-40 Traffic

20,000 VPD
35% Trucks
2.3 million ESAL’s/Year
Riordan Project

Built 1985

25 cm HMA

15 cm Perm HMA

15 cm Drainable AB
RIORDAN CROSS SECTION

28 cm AC
15 cm BTB
10 cm AB
Eng. Fabric
Sub Grade
Built 1969

20 cm PCCP
18 cm CTB
Clay/Cinder Subgrade
I-40 Pavement
Badly Cracked
Rough Ride
High Maintenance
Flagstaff Overlay

Crack & Seat
7.5 cm HMA
5 cm AR-HMA
1.25 cm AR-OGFC
FLAGSTAFF CROSS SECTION

1.25 cm AR-OGFC
5 cm AR-AC
7.5 cm AC
PCCP Crack & Seat
Sub Grade
Arizona D.O.T., Materials Group
AR-AC & AR-ACFC Gradation Chart

AR-AC
AR-ACFC

% Passing

Sieve Sizes to 0.45 Power

#200 #100 #50 #40 #30 #16 #10 #8 #4 1/4" 3/8" 1/2" 3/4"
Asphalt Rubber

80 % Asphalt
20 % Ground Tire Rubber
Percent Binder

4.6% HMA/AC-20
6.6% AR-HMA
9.0% AR-OGFC
## Metric Ton of Mix

<table>
<thead>
<tr>
<th>Mix Type</th>
<th>Kgs of Asphalt</th>
<th>Kgs of Rubber</th>
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<tbody>
<tr>
<td>HMA</td>
<td>42</td>
<td>0</td>
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<tr>
<td>AR-HMA</td>
<td>48</td>
<td>12</td>
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<tr>
<td>AR-OGFC</td>
<td>66</td>
<td>16</td>
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</tbody>
</table>
HMA-Asphalt Binder

AC-20
PG 64-16
Asphalt Rubber Binder
AC-10
PG 58-22
SHRP SPS-6

National Overlay Study
Focus on Thickness
10 cm & 20 cm HMA Overlay
Figure 5  EXISTING PAVEMENT SECTION
Figure 2

HMAC OVERLAY THICKNESSES

8 Inch

4 Inch
SHRP SPS-6
Overlay PCCP

20 cm HMA
10 cm HMA
5 cm AR-HMA/5 cm HMA
• Flagstaff AR
• Riordan
Cracking in Meters

![Bar chart showing cracking in meters for different years and types of HMA.](chart.png)
Benefits of AR

$18 million savings
Four Years Less Construction Time
Implementation

Over 2,500 miles of AR projects built since 1990