



**2015 PAPA
Regional Technical Meetings**

Recycled Tire Rubber Projects

**Steven L. Koser, P.E.
Chief, Roadway Management**



March 30 – April 1, 2015



▶ Recycled Tire Rubber

- Why is rubber used in pavements?
- History of use in PA
- Gap-Graded and Dense-Graded



▶ Asphalt Rubber Gap-Graded Mix

- Minimum 15% rubber by weight of asphalt binder
- On-site blending or at a facility
- Wet Process

▶ Asphalt Rubber Gap-Graded Mix

Advantages of Gap-Graded

- Higher AC
- Reduced Drain-Down
- Increased Flexibility
- Improved Resistance to Cracking
- Long-Term Durability



▶ Dense-Graded Rubber Mix

- Continuously Graded
- Wet Process
- Lower Viscosity, Rubber Content, and Rubber Size Than Gap-Graded
- Limited Use Nationwide

▶ Dense-Graded Rubber Mix

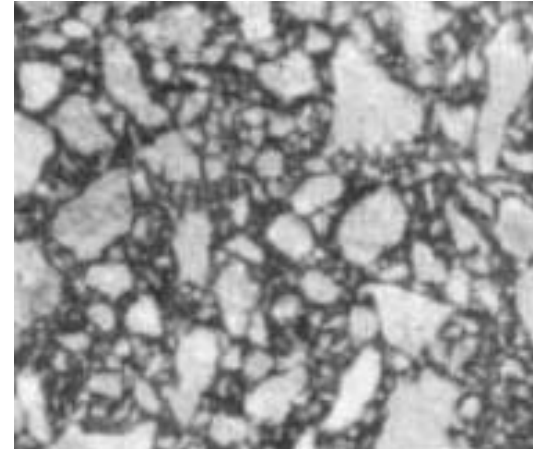
- AASHTO M320-14
- PennDOT's Predominant Mix Type



▶ Dense-Graded Rubber Mix

Advantages of Dense-Graded

- Reduced Permeability
- Improved Resistance to Cracking
- Pavement Layers
- Long-Term Durability



▶ Asphalt Rubber Gap-Graded Pilot Projects

- I-78 in Berks County
- US 15 in Snyder County
- US 15 in Adams County
- I-376 in Lawrence County



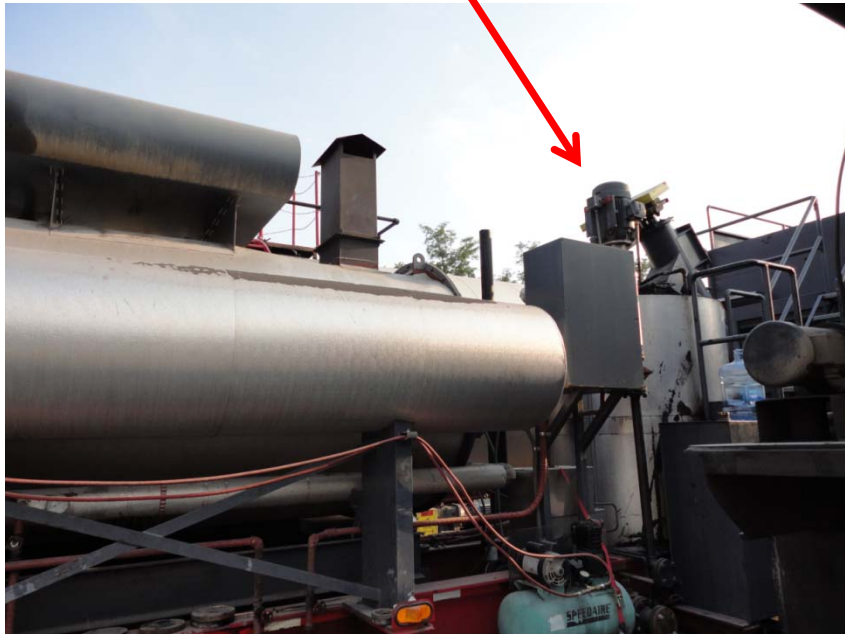
I-78 Gap-Graded Pilot Project

- Asphalt Rubber 12.5mm WMA Wearing Course
- Control section used a polymer modified PG 76-22, 9.5mm mix
- Utilized the ASTM D 6114, Type II, **“Wet Process”**
 - Rubber blended with liquid binder in reaction tank
 - Binder receives good properties of tire rubber (i.e. anti aging, UV protection)
 - Higher film thickness achieved on aggregate particles
 - Produces a grade bump (PG 64-22 becomes \approx 78-24)

▶ Asphalt Rubber Gap-Graded Pilot Projects

Blending Unit

CRM Hopper / Reaction Tank



▶ Dense-Graded Pilot Projects

- District Memo
- Pilot Projects



► Dense-Graded Pilot Projects

Project	CRMAB Paving (Miles)	Pavement Layers to use CRMAB
1	1.00	Wearing
2	1.15	Wearing
3	3.30	Wearing
4	3.10	Wearing
5	4.00	Wearing
6	1.18	Wearing & Binder
7	0.48	Wearing

Total Length of CRMAB Paving = 14.83 Miles

➤ Accelerated Innovation Deployment (AID) Grant

- **FHWA AID Grant**
 - Innovative Technologies
 - Improve Standards for Construction Quality
 - Constructing Longer Lasting Highways
- **Up To \$1 Million Grant**
 - 80% Grant and 20% State Match
- **Monitor and Evaluate Projects**