

# **BENEFICIAL USE MATERIALS**

**2022 Lesson's Learned**

**March 8, 2022**



**Jim Pappas**

**Transportation Resiliency & Sustainability**

# TOPICS

- Why use?
- Typical beneficial use materials
- Concerns
- Benefits
- Future
- Impediments to implementation
- How to overcome?

**“A failure teaches that something  
can’t be done ... that way.”**

Thomas Edison

# WHY BENEFICIAL USE MATERIALS?

- Engineering benefits - similar/better performance
- Environmental benefits – no land filling/GHG reductions, save finite natural resources
- Economic benefits – potentially?
- Psychological – helping the planet today and for future generations

**“The greatest gap in life is the one between knowing and doing.”**

Dick Biggs

# **BENEFICIAL USE MATERIALS**

- **RAP** – Recycled Asphalt Pavement/Millings
- **RCA** - Recycled Concrete Aggregate
- **RAS** – Recycled Asphalt Shingles (pre and post consumer)
- **Tires** – Embankment, HMA/WMA
- **Fly Ash** – Concrete and Embankments
- **Slag** – Ground Granulated Blast Furnace Slag in concrete
- **Glass, Foundry Sand, Plastics**
- New markets are continually developing

# CONCERNS

- Applicability - performance/service life
- MSDS/toxicity
- RAP
  - Binder replacement in HMA/WMA
  - Use as GABC replacement/substitute
- RCA
  - Future chemical deterioration in concrete
- Quality Control/handling
- Bidding vs. virgin materials
- Regulatory – local and national

# CONCERNS (cont)

- Costs
- Unfamiliarity
- Variability
- Availability
- Lack of standards/specifications
- Champion/technical support

# BENEFITS

- Engineering
- Environmental
- Economic

# FUTURE

- Political “pressure”... (EPD’s in Cal.)
- DOT priority
- Measuring “greenness” (i.e. LEED)
- Risk vs. Reward
- Public Relations/marketing
- Documented performance and costs



# IMPEDIMENTS TO IMPLEMENTATION

- Misconceptions
- Bad (past) experiences
- Lack of knowledge
- Regulatory challenges
- Department (Agency)/Contractor willingness

**“Success is measured by your ability to maintain enthusiasm between failures.”** Winston Churchill

# THANK YOU FOR YOUR TIME

**“It is hard to fail, but it is worse never to have tried to succeed ... he who makes no mistake makes no progress.”**  
Theodore Roosevelt



Jim Pappas

[james.pappas@delaware.gov](mailto:james.pappas@delaware.gov)