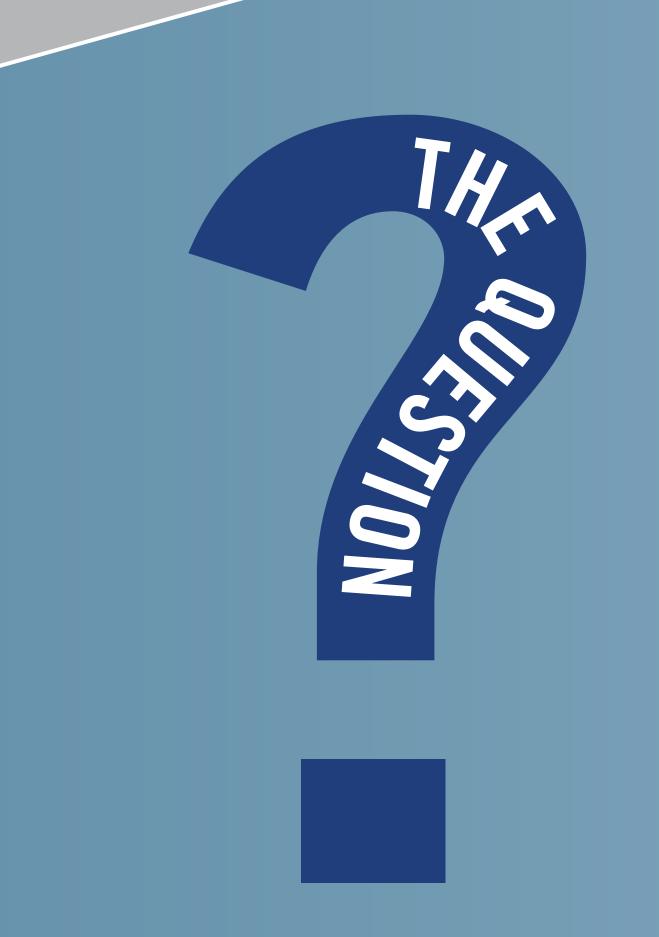
MEETING THE INDUSTRY CHALLENGES ASSOCIATED WITH UTILIZING **RECLAIMED ASPHALT SHINGLES (RAS) IN ASPHALT CONCRETE – AN AGENCY PERSPECTIVE**

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Do you believe that 100% of the binder in Recycled Asphalt Shingles (RAS) becomes available to the total binder component of an asphalt mixture incorporating RAS?

If not, you believe in "Partial Contribution"

If the Binder Contribution of RAS is Only Partial...

So How Does an Agency Make Sure...



this...



State of the Industry

- AASHTO Standard Practice for RAS
- Construction Materials Recycling Association guide "From **Roof to Road**"
- Many US DOTs allow 3% to 7% RAS
- Canadian Agencies range from "up to X%" to "not permitted"

... Do We Know What the Mixture Properties Are? For partial RAS binder contribution the VMA and Film Thickness are lower. Durability???









City of Calgary Experience

- ufacturer's Waste since
- Post-Consumer first considered in 2012
- Performance-related testing



increasing knowledge

... Do We Know What the Binder Rheology Is?

Do we need to change the way we evaluate binder characteristics? Can we sacrifice high temperature performance based on a 100% contribution theory? Rutting???







The Challenge? How do we get....



from this...

..to this?



... Can We Effectively Manage the Quality of RAS?

The Agency has no "control" over RAS quality because there is not contractual agreement with Suppliers? Quality Management???



