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| **BEST PRACTICES** |
| **Recycled Asphalt Shingles (RAS) in Town Gravel Roads** |
| **Expected Benefits**  The fines in RAS help to bind the roadway materials which results in less dust and more water retention which leads to reductions in rutting, washboarding and potholing. With the reduction in road surface issues the Town will not need to perform maintenance as often, saving money, time and effort that can be spent elsewhere.  This effort will divert some of the estimated 25,000 tons of waste asphalt shingles generated in Vermont every year. It will also reduce the amount of virgin aggregate needed.  **Site Selection**  RAS may be appropriate on gravel roads with a history of potholing, rutting, washboarding, airborne dust and higher maintenance costs associated with them.  **Materials**  Towns using RAS can utilize gravel from their regular source. The Towns should ensure that RAS provided meets AASHTO MP-23, which calls for material 3/8” minus (100% of material passing the 3/8” sieve) and is free of deleterious materials. RAS will agglomerate when stored through seasons, consolidating when it gets cold, so it is recommended that freshly ground RAS be used for projects. Or, in cases where the RAS has been sitting in a stockpile for a time, it should be run through the grinder again before being shipped to sites for use. It is recommended that the RAS/gravel mix should be between 20-35% by volume. Lower than 20% has not shown any roadway surface improvements. An upper limit for RAS has yet to be established but too much RAS may result in difficult maintenance and roadway cracks.  **Installation**  Towns can use their own gravel road maintenance standard practices.  The RAS/gravel mix should be mixed until homogeneous. Mixing can take place either on the road surface or offsite and trucked to the site. After the mix is placed, the road shall be graded, then shaped to allow for water runoff. Compaction with a vibratory roller, if available, is suggested. After compaction, the application of liquid calcium chloride is recommended to bind the RAS and gravel. If the installation will take longer than one day, it is recommended that the road surface be sprayed with calcium chloride at the end of each day and sprayed with water at the beginning of each day to create a more malleable surface for grading.  If any issues arise it is recommended that the road be regraded, compacted and calcium chloride be applied to the surface.  **Lessons from Recent Demonstrations**  All Towns who participated in RAS demonstrations in VT in 2018-2020 confirmed better surface conditions of the road surface after installation. All issues with the material were easily fixed with mechanical means. Towns have reported less need for maintenance work at every test site. If RAS costs remain reasonable (currently $15/ton), some towns plan to install RAS on more gravel roads due to the performance of the pilot project.  **Selected Additional Resources**  For more information about RAS in Town Gravel Roads please visit our [website](https://vtrans.vermont.gov/planning/research/ras) |