



# STRATEGIC RECYCLING PROGRAM FACT SHEET

Original Date: FY 2005  
Updated: FY 2020

*Project:*  
**Tarrtown Bridge**

*Site Location:*  
**PennDOT District 10-0  
Tarrtown, SR 4023**

*Date of Project:*  
**2002-2005**

*Recycled Material:*  
**Waste Tires**

*Estimated Quantities:*  
**560,000 shredded  
passenger tires = 5,600  
tons of recycled  
shredded tires**

*Partnerships:*  
**The Pennsylvania  
Department of  
Environmental  
Protection provided  
funding and assistance  
for this project.**

*Did you Know?*  
**Municipalities can  
request the use of liquid  
fuel monies to support  
projects that utilize  
recycled materials.**

## Introduction

In 2002, PennDOT embarked on a project that would use groundbreaking technology to reuse passenger tires that would have been otherwise sent to landfill for disposal.

PennDOT District 10-0 constructed the Tarrtown Bridge using the shredded tires as lightweight embankment fill on two bridge approaches along State Route 4023, Section 150. The bridge spans a small tributary stream of the Allegheny River and services a high traffic load.

At the time, the Tarrtown Bridge project was an innovative project for several reasons. First, a lightweight geotechnical fill was required at the two bridge approaches due to existing soft soil conditions. Thus, the use of shredded recycled tires as embankment fill was selected based on material characteristics and anticipated shortened settlement times, allowing for a more expedited construction schedule.



## Tire Shredding Operations

Secondly, this was the first PennDOT project that utilized separate embankment and bridge instruments to monitor response and settlement through construction and post-construction of the bridge.

Each inclinometer contained between five to fifteen monitoring magnets, including a combination of datum, plate, and spider magnets.

- Datum magnets were imbedded in bedrock and were used as stationary reference points.
- Plate magnets were used between soil and tire shred layers to differentiate between tire shred layers, tire shred compression, and foundation consolidation.
- Spider magnets were free to slide up or down the inclinometer as the foundation settled.

In 2006 the project site experienced minor settlement of material. PennDOT addressed the settlement issues promptly and the bridge returned to normal operation.



## Constructed Bridge / Embankments

## Project Update

In 2020, the SRP performed a follow-up on the performance of this project. The District 10-0 Geotechnical Engineer stated that the embankments are performing as expected, and no additional settlement of the embankments has occurred. This type of project has not been repeated in the Commonwealth; however, other projects utilizing waste tires in other applications have been completed.

## Summary of Project

Over 5,000 tons of tire shreds were needed for this project. Therefore, PennDOT used a wide targeted approach to collect the required amount of scrap tires, including tires from four community collection/drop off days, tires from six Pennsylvania abandoned tire piles, tires from sites under consent orders for cleanup, and other traditional sources such as tire dealers.

A six-acre site located near the bridge site was selected to be used to process and stockpile tires. All shredding of tires was performed at this site. Tires were shredded per specifications that set specific restrictions to length, gradation, free and exposed steel and amount of allowable deleterious materials (oils, gasoline, diesel fuel, hydraulic fluid, grease, ice, snow, and burnt tires).

During the project over 230 embankment and bridge instruments were incorporated into the bridge project, where data collection was performed manually and through automated systems. The instruments were used to monitor site conditions and bridge response through various bridge construction phases and post-construction conditions. Instruments used included inclinometers, total pressure cells (pressure against abutments), piezometers (subsurface water pressure), and thermistors (temperature). Twenty inclinometers with dual purposes, measuring both horizontal (inclination) and vertical (settlement) movement were used to monitor each embankment.

Four inclinometers were installed to monitor the four most critical centerline road stations.



## Processed Tire Shreds

## Project Information:

The primary contractor for the Project was Russell Standard Inc., located at 2002 Pittsburg Avenue, Erie, PA.

## Project Contacts:

Steve Geidel, District 10-0, Construction Services Engineer

Alicia Kavulic, District 10-0, Geotechnical Engineer

## For Additional Information:

Go to the Strategic Recycling Program page on the PennDOT website at:  
<https://www.penndot.gov/ProjectAndPrograms/RoadDesign/Environment/Environment/PollutionPrevention/Pages/default.aspx>. or send a request to [PennDOTSRP@pa.gov](mailto:PennDOTSRP@pa.gov).