

Project Overview Report

1. UTC Identifying Number

DTRT13-G-UTC28

2. Center Identifying Number

CAIT-UTC-NC43

3. Project Title

Sustainable Geotextiles for Transportation Applications from Recycled Textiles

4. Principal Investigator & Contact Information

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6. Customer Principal

Colleen Morrone
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7. Project Description

The goal of this research is to develop useful geotextiles from a sustainable, cheap input source – waste stream apparel and textiles. The anticipated outcomes of this research are identification of transit applications for geotextiles that have lower installation and removal costs and hence reduced life cycle costs for highway and bridge construction, repair, and maintenance operations. Previous research with Goodwill of Delaware and Delaware County (Goodwill) has shown that their unsold textiles come in a variety of material types and volumes – cotton, polyester, wool, and mixed blends of fibers for example. For this research project we will cooperate with Goodwill to gain access to discarded textiles. Discarded textiles will be sorted by material type. The textiles will be processed using several methods:

- (a) Joining existing textiles into a single fabric through a variety of seaming techniques,
- (b) Shredding the textiles to make "shoddy" a fiber product, and
- (c) Using shredded textiles as an input to manufacture nonwovens.

A literature review of the existing performance and cost of geotextiles and geosynthetics (including fibers) will be made for transit applications. This will be written up in a report for owners and eventually shared in a webinar at the end of the project. The developed textiles from recycled inputs (joined, shoddy, and inputs for nonwovens) will be tested for their performance depending upon their transit application end use. The textiles with the best performance will be evaluated to assess their ability to scale up into manufacturing processes including identifying processing limitations and costs.

8. Implementation of Research Outcomes (or why not implemented)

An analysis of waste textiles' performance as geotextiles for transit applications will be published in a relevant industry journal and/or conference proceedings. Textile samples will be tested both in laboratory and simulated field settings. A webinar will be held for transportation professionals on the best practices for using geotextiles in transit applications including highlighting the results of the

research, and will be a platform to disseminate the report. Collaborations with Goodwill of Delaware and Delaware County's Recycled Good Manufacturing Initiative and SMART (Secondary Materials and Recycled Textiles) Industry Association will be established in order to disseminate research results and to interest recycled textile manufacturers in exploring production of a new product, geotextiles from waste stream textiles.

9. Impacts/Benefits of Implementation (actual, not anticipated)

TBD

10. Dates and Budget

Start Date: 9/1/2016

End Date: 8/31/2018

UTC (CAIT) Dollars: \$ 59,349

Cost Sharing: \$ 59,401

Total Dollars: \$ 118,750

11. Keywords

geotextiles, recycling, sustainability, fiber stabilized soils

12. Web Links (Reports and Project Website)

<https://cait.rutgers.edu/cait/research/sustainable-geotextiles-transportation-applications-recycled-textiles>