Executive Summary:

In early 2020 colleagues at the Vermont Agency of Transportation (VTrans) and Minnesota Department of Transportation (MnDOT), secured Federal Highway Administration (FHWA) State Transportation Innovation Council (STIC) funding from the VT State Transportation Innovation Council to undertake a bi-state peer exchange. The purpose of this peer exchange was to bring the two states together in VT to share innovative practices involving reducing plastics and other toxic material from erosion prevention and sediment control (EPSC) products and practices. VTrans had successfully eliminated the use of plastic-based erosion control matting, and MnDOT was well on their way towards implementing a 10-year plan towards the total elimination of plastics (including micro-plastics) and toxics from EPSC products and practices in that state.

By spring of 2020 it was evident that there would be no in-person meeting-of-the-minds due to COVID-19 and the associated safety restrictions – at least not in the foreseeable future. Nevertheless, as the old adage professes, out of adversity comes opportunity, and a new (and improved) idea began to form. Rather than scuttling the peer exchange altogether or shelving it until we collectively returned to "normal," the planning team shifted gears to expand the scope and the reach of this peer exchange. With the assistance of a conference planner, VTrans and MnDOT developed a three-day virtual conference: Reducing Plastics and Other Toxics from Erosion Control Products & Practices; A Nationwide Virtual Peer Exchange. The agenda also included summaries of locally sourced materials such as hemp and wool for possible inclusion into EPSC specifications and products. This free event occurred November 17 – 19, 2020, and reached over 150 participants from around the United States and Canada. Among those attending the event were DOT/DNR representatives from 22 different states; federal agency representatives from FHWA, VAAFM and Mn Dept of Ag, USF&WS, BLM, Parks Canada; researchers from The University of Vermont, Auburn University, University of Northern Iowa; representatives from World Bank, municipalities, non-profits, engineering firms, and EPSC product manufacturers and distributors.

Key takeaways:

- More states have phased out plastic (or are working on it or are interested in getting started) than any one state thought. Twenty-two states now know this. The fact that manufacturers now know that 22 states know this may spur more research and development.
- The fact that multiple states have prohibited plastic from blankets, hydromulches, and filter logs shows that fully functional biodegradable alternatives are already commercially available. Anecdotally speaking, prices of biodegradable and non-toxic products started out higher in those states but decreased after only a few years. The overall life cycle cost of some biodegradable products may be much cheaper because they avoid removal and disposal costs that are inherent in some plastic products.

- Natural fiber that has been used to replace plastic is sourced primarily from jute and coir, which are produced internationally. Hemp and wool fibers show considerable potential for use in erosion and sediment control products, and these products present a good starting point for building domestic fiber industries using such materials. More R&D is needed to develop processing methods and supply chains if we hope to have products made from domestic fibers.
- The toxicity of malachite green dye has caused one state to prohibit it from hydromulch products. Multiple other states specifications prohibit any toxic materials in hydromulches, but they do not specifically prohibit malachite green. There may be a serious disconnect here, as it was unclear whether or not malachite green is being used in the hydromulch sold to those states. One manufacturer stated that they only produce hydromulch free of malachite green for that one state.
- Increased coordination among states is needed to improve consistency in requirements and definitions. This would make it easier for manufacturers to provide the biodegradable and non-toxic products sought by states.

Recommendations

- There is a need to maintain momentum by spreading the word about this peer exchange. Possible dissemination opportunities are presentations at conferences like ICOET (International Conference on Ecology and Transportation), IECA (International Erosion Control Association) and articles in trade magazines.
- The enthusiasm generated by the peer exchange should be channeled into an ongoing working group focused on increased coordination and consistency. If we can maintain some progress, we'll be able to achieve critical mass of states asking for biodegradable and non-toxic products. With enough states requiring such products, the industry will have an easier time making the transition.
- The AASHTO Committee on Materials and Pavement (COMP) is seeking state representatives for a subcommittee to develop national standard specs for erosion and sediment control materials. This is an opportunity to steer that national spec toward biodegradable and non-toxic materials.

One of the most salient take-home messages from the three days is that there is a collective desire for continuous improvement and innovation in how we conduct EPSC work. Our hope is that these three days shed some light on the opportunities for advancing the state of the art and practice of EPSC, and that this dialog will continue.

Thank you for your participation in this event! – *MnDOT and VTrans*