

<b>UTC Project Information</b>	
Project Title	MPC-637 – Assessing and Improving Efficiency of Snowplowing Operations via Data and Analytics
University	University of Utah
Principal Investigator	Nikola Marković, Ph.D. Cathy Liu, Ph.D.
PI Contact Information	<p>Nikola Marković, Ph.D. Assistant Professor Dept. of Civil and Environmental Engineering University of Utah Phone: (801) 585-2877 Email: nikola.markovic@utah.edu ORCID: 0000-0003-0883-2701</p> <p>Cathy Liu, Ph.D. Associate Professor Dept. of Civil and Environmental Engineering University of Utah Phone: (801) 587-8858 Email: cathy.liu@utah.edu ORCID: 0000-0002-5162-891X</p>
Funding Source(s) and Amounts Provided (by each agency or organization)	<p>USDOT, Office of the Assistant Secretary for Research and Technology \$40,000</p> <p>Utah Department of Transportation \$50,000</p>
Total Project Cost	\$90,000
Agency ID or Contract Number	69A3551747108
Start and End Dates	October 30, 2020 to July 31, 2024
Brief Description of Research Project	The core objective of this research is to improve the efficiency of UDOT’s snowplowing operations. First, we will leverage GPS and GIS data to evaluate the current efficiency of UDOT’s operations. Second, we will seek to improve the plowing operations with the existing resources. This will be achieved by optimizing snowplow routes and salt dome locations. These improvements are expected to reduce turnaround time by 5% to 10%. Lastly, we will develop a software to allow UDOT to efficiently manage state’s plowing operations.
Describe Implementation of Research Outcomes (or why not implemented)  Place Any Photos Here	The results of the project have been implemented in practice in 12 cities in Utah, resulting in relevant improvements. The implementation required two to five meetings with each city’s foreman to discuss the current operations as well as the proposed solution. <a href="#">Watch an animation of the new snowplow routes on YouTube.</a>

Impacts/Benefits of Implementation (actual, not anticipated)	On average, the turnaround time was reduced by 15%, thereby improving the level of service with the existing resources. In addition, the total vehicles miles traveled were reduced by 5% on average, thereby reducing the cost of snow removal operations.
Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project Website</li></ul>	<ul style="list-style-type: none"><li>• MPC Research Report – <a href="#">Assessing and Improving Efficiency of Snowplowing Operations via Data and Analytics</a></li></ul>