



FROM THE MANAGER

2020—What a year!

Welcome to the latest edition of NCDOT Research and Development News. As we enter 2021, the Research Program is moving forward into the new year and pushing forward with the new and the innovative. 2020 provide a remarkable number of challenges across the agencies—projects large and small were put on hold, including the new FY2021 Research Projects that had been scheduled to start last summer. The good news is those projects are moving forward as of January 1, 2021!

2020 also introduced the entire world to the power (and limitations) of virtual meeting technology. I think “Can you hear me?” and “You might be muted...” are high candidates for non-pandemic related phrases of the year.

While much of the world was placed on pause, we still managed to get a tremendous amount of work done using these tools too keep projects on course.

In many cases, attendance at state and national meetings was expanded—employees that in the past would have had difficulty traveling due to budget or time constraints were able to attend events that otherwise could not. For instance, the TRB Annual Meeting reported around 20,000 individual attendees—up from 14,000 at the previous high!

2021 promises to continue some of the challenges of 2020, but I think we are all in a better place to manage and succeed! We are looking forward to kicking off 20 new projects, on time, this summer and also looking forward to the new and interesting research ideas from our NCDOT partners! Don’t miss the link on page 5 for an update to TRB’s Critical Issues in Transportation featuring COVID-19 related information.

Neil Mastin,

Research and Development Unit Manager



Image: Salisbury Train Station

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Recently Completed Research Projects

RP 2020-36: [Safety of the Urban Freight System: Key Performance Indicators](#), Principal Investigator: Noreen McDonald, Ph.D., Department of City and Regional Planning, University of North Carolina at Chapel Hill

Project Manager: Curtis T. Bradley Ph.D., Research Implementation Manager

Goods movement benefits the North Carolina economy by providing firms and consumers with needed materials. The freight sector has long monitored key performance indicators (KPIs) focused around delay and efficiency. This project focused on how monitoring of road safety KPIs could benefit goods movement in North Carolina. We recommend that North Carolina Department of Transportation (NCDOT) Office of Logistics + Freight (OLF) consider systematic monitoring of commercial vehicle-involved crashes across the state by focusing on overall crashes, fatalities, and severe injuries. We suggest that monitoring efforts leverage existing work based on the police crash reports. For example, the Commercial Vehicle Enforcement Resource Lab (COVERLAB) at North Carolina State University currently geocodes and presents information on commercial vehicle crashes. We recommend OLF consider augmenting currently available indicators with information on the number of commercial vehicle crashes involving vulnerable road users, i.e. pedestrians and cyclists, as this is an emerging area of concern in road safety. Additionally, we recommend that OLF track publicly available indicators on an annual basis using the database that we have provided in this report.

The screenshot displays the COVERLAB website interface for searching North Carolina Commercial Motor Vehicle (CMV) crashes. The header includes the COVERLAB logo and navigation links: About Us, Data Visualizations, Research and Analysis, and Vision Zero. The main content area is titled "NORTH CAROLINA CMV CRASHES" and includes a warning icon indicating the last date of available data is 7/31/2020. The search filters are as follows:

- SELECT FILTERS:**
 - Year of Crash Date: 2020
 - Select Location: State (dropdown menu showing NC)
 - Report Agency: (All) (dropdown menu)
- SELECT MEASURE:**
 - CMV-involved fatalities
 - CMV-involved fatal crashes
 - CMV-involved crashes
 - CMV-involved injuries
 - CMV-involved PDO crashes

The search results are displayed as a large number "113" with the text "CMV-involved fatalities" below it.

[COVERLAB](#) (Commercial Vehicle Enforcement Resource Lab)

RP 2017-27: Storm Water Infiltration and Pollinator Habitat Zones Along Highways, Principal Investigator, Richard A. McLaughlin, Department of Crop and Soil Sciences, North Carolina State University

Project Manager: John Kirby

This project explored the possibilities of managing soils on new and existing roadside areas to reduce runoff through increased infiltration. This was pursued through several greenhouse studies, controlled field plots at three sites monitored for three years, and several installations on existing roadside areas.

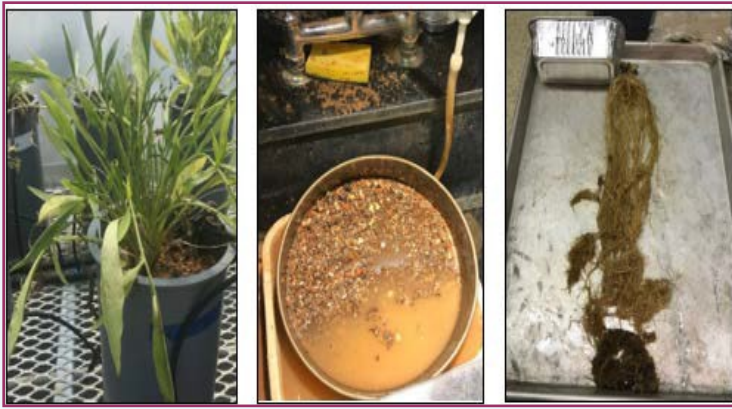


Image: Representative Pictures of Wildflowers in the Greenhouse, Washing Roots, and a Washed Root Sample



Image: Plot Establishment at the 98 Site near Raleigh, NC

Tillage was very beneficial for improving infiltration in compacted soil, often by a factor of 3X or more.



Image: Measurement of Infiltration

Incorporating compost at the rate tested, 5cm incorporated into 15cm of soil, often had additional benefits but not always. Improved vegetation establishment and resistance to compaction may result from the compost treatment. Traffic from tractor mowers can reduce or eliminate the infiltration benefits, however. Wildflowers as a substitute for grass can provide greater infiltration potential, in part because mowing traffic is reduced from four times per year to one. Among the many wildflowers that were planted as a mix, very few were present in our plots. However, those perennials that dominated (Lanceleaf coreopsis and blanketflower) were quite resilient in both field plots and under different soil conditions in the greenhouse tests, and would be highly recommended based on their ability to grow and develop robust root systems.

[=====]

Librarian's Corner By Lamara Williams-Jones

Segregated Railway Car Being Restored for Display at the North Carolina Transportation Museum

The National Park Service has awarded a grant to the North Carolina Department of Natural and Cultural Resources (NC DNCR) to renovate a 1920s Southern Railway car that complied with Jim Crow Era Laws. The car known as the 'Jim Crow Car,' contains 44 seats of which 22, in the rear, were designated for African Americans. It is one of only a few such cars nationwide held by a museum for public viewing according to a press release from (NC DNCR). The \$287,442 grant will renovate the coach which is in disrepair with torn seats that need to be removed, reupholstered and reinstalled. Other repairs include, asbestos removal, evaluation for lead paint and possible removal along with rust removal and other structural repairs.

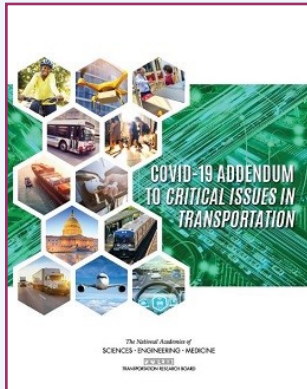
Once renovated, the No. 1211 will allow museum staff to contextualize segregation and its inequality. It will also expand upon the segregated history of Southern Railway's Spencer Shops located in Spencer, North Carolina. Spencer Shops was once a major steam locomotive repair shop between Atlanta and Washington, D.C. Black and white workers toiled together but Southern Railways [paid black workers less](#), refused to promote them to craftsman jobs and forced them to use separate toilets, washrooms and drinking fountains. The former Spencer Shops was phased out from the 1950s through the 1970s with the advent of the diesel powered locomotive and is now home to the North Carolina [Transportation Museum](#).



Image of Southern Railways No. 1211 from North Carolina Department of Cultural Resources

New Publications from Transportation Research Board

[COVID-19 Addendum to Critical Issues in Transportation](#)

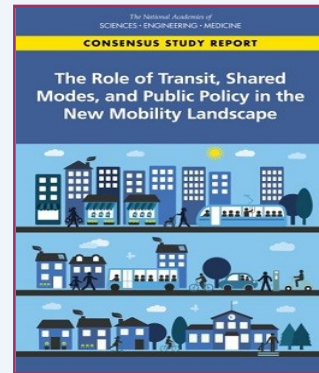


The year 2020's raging coronavirus pandemic and reckoning with long-standing racial injustice led to widespread disruption and suffering, social unrest, and renewed calls for an accounting of our fragmented public health system and troubled history of racial inequity.

In this addendum to [Critical Issues in Transportation 2019](#), the Transportation Research Board (TRB) Executive Committee updates all of the critical issue topic areas to address the short-term and potential long-term effects of coronavirus disease 2019 (COVID-19) on transportation.

An additional addendum will be issued later in 2021 that delves much more deeply into the equity issue to probe and question transportation's role in contributing to and redressing racial injustice.

[The Role of Transit, Shared Modes, and Public Policy in the New Mobility Landscape](#)



Shared modes of transportation, such as ride-hailing, scooter sharing and bike sharing, can enhance mobility, equity, and sustainability in metropolitan areas if combined with public transit and increased in scale,

This special report recommends deliberate and strategic measures in order to realize the full and potentially transformative benefits of shared services with cities, transit agencies and shared mobility providers collaborating in various ways.

These measures include providing travelers with real- or near real-time information on combinations of available price and service offerings, smartphone applications that simplify the process of arranging and paying for the use of multiple transportation modes for a single trip, and more public sector coordination of services across modes and jurisdictions.

Calendar of Events

March 2021

- **NC DOT Board of Transportation Meeting, March 3-4, 2021(Virtual)**

April 2021

- **NCDOT Board of Transportation Meeting, April 7-8, 2021(Virtual)**

Library Notes

- Come across a resource you need that's not available in our [Online Catalog](#)? I may be able to get the item for you via Interlibrary Loan at minimal or no cost to you.
- Contact the NCDOT Librarian, [Lamara Williams-Jones](#), for assistance: 919-707-6665, Monday through Friday from 8:30 to 4:30. Since there is only one Librarian, customers should call before visiting the Library.

NCDOT Research and Development Office General Information

How to find us:

We are located at:

1020 Birch Ridge Dr, Building B

Raleigh, NC 27610

The [Research & Development web page](#) contains more information about the Office and what we do.

The Research Library's [catalog](#) is also available on the web.

NCDOT RESEARCH AND DEVELOPMENT

The Research & Development Office oversees transportation-related research that investigates materials, operations, planning, traffic and safety, structures, human environments, natural environments, and more. Please contact one of our engineers or the transportation librarian listed on this page if you have questions.

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RESEARCH & DEVELOPMENT