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Institute for Transportation Research and Education
at North Carolina State University

**Exploring and advancing transportation systems
through research, education and technical assistance.**

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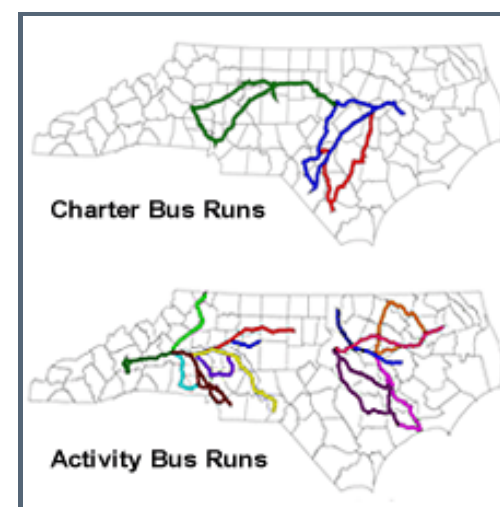
ITRE project team determines efficiency of statewide residential school bus routing

September 29, 2011

- Project investigates efficiency of statewide bus routing system
- GIS data from statewide street network was successfully tested
- Data was used to generate optimal routes across the state

RALEIGH, NC — The staff of the Pupil Transportation Group at the Institute for Transportation Research and Education (ITRE) at North Carolina State University has been involved in bus routing and scheduling-related projects for school districts for over 20 years. This past summer, the group embarked on a project that has never been attempted before - school bus routing that covers the entire state of North Carolina.

As part of state government restructuring, three residential schools formerly operated by



Maps indicate routes taken by buses.

the Department of Health and Human Services (DHHS) were transferred to the Department of Public Instruction (DPI) in June of 2011 and are now part of the Educational Services for the Deaf and Blind (ESDB). Together, the Governor Morehead School for the Blind in Raleigh, the North Carolina School for the Deaf in Morganton, and the Eastern North Carolina School for the Deaf in Wilson provide education to over 200 special needs children across the state.

To accommodate students who live at the three schools during the week, DHHS began using a combination of three charter buses and 14 activity buses to transport students to and from the schools. Students are picked up every Sunday afternoon at various staging locations across the state and then dropped off the following Friday afternoon at the same location. Some of the bus routes exceed nine hours round trip.

Prior to the move to DPI, ITRE was contracted by DHHS to assess the efficiency of the bus routes. In order to accomplish this project, ITRE utilized the statewide street network from NC OneMap, the state clearinghouse for geospatial information. Even though it has been used for various applications, the statewide street network data was untested for routing purpose. The ITRE project team lead by Mickey Michael and Bonnie Sluder successfully used this data to generate optimal routes from one end of the state (Manteo) to the other (Murphy).

Coupled with the street network data, student resident information and pick-up/drop-off sites were located using the data from NC OneMap. The project team reconstructed the current charter bus and activity bus routes for the efficiency assessment.

The project team was pleased to report to DHHS and DPI that the current bus routes for these three schools are already fairly efficient. The team made a few recommendations that will increase efficiency and improve the level of services for the bus routes. As a result of their work on this project, ITRE's Pupil Transportation Group is now charged with maintaining the routing system for these three schools.

Additional information is available about the [Public Transportation Group](#).

The Institute for Transportation Research and Education (ITRE), administered by North Carolina State University, is a non-profit organization that conducts research, education, and technical assistance projects on a wide variety of surface transportation issues with the goals of solving problems and creating new products, better services and smarter workers. ITRE is located on NCSU's Centennial Campus.



