Project Overview

Penn Transit is the division of the University of Pennsylvania that provides free transit services to all members of the Penn community on and around campus. PennRoute is a project developed by four Penn Engineering students in 2012 that works with Penn Transit to improve the Penn Shuttle services. Hundreds of Penn students and faculty members use this “to-door” shuttle services every day; and PennRoute seeks to optimize the quality and efficiency of its pick up and drop off process.

PennRoute replaces the previous method for dropping off passengers that required the driver to write down each passenger’s destination as they board the shuttle and determine the best route to drop off as many as 15 passengers in one trip. Even with extensive training programs for drivers, this method was resulting in inconsistent and inefficient quality of delivery.

The new PennRoute system is implemented on Android tablets installed on the shuttles next to the drivers that generate the optimal route in real time based on inputs by the driver. This smart routing application provides the shortest route from input addresses and utilizes a custom database to record and store log information automatically.

The Penn Green Fund Grant awarded to the project in Fall 2011 was used to purchase tablets and to cover wireless data fees and installation costs. The system has been successfully deployed on Penn Transit shuttles and has demonstrated significant benefits.

View PennRoute’s Deployment video–Watch Here

Lessons Learned

PennRoute provides significant benefits to Penn Transit and to the entire Penn community. One of the key takeaways from this project is the potential for scalability.
of PennRoute’s routing algorithm that is based on Google Maps. The project leaders believed that a large opportunity exists to implement this system in other capacities, specifically citing airport shuttles.

Additionally, information from an initial route comparison shows a total of 35 miles savings per day for all four shuttles, with an annual reduction of 12,600 miles. This results in a yearly fuel savings of 1,800 gallons, based on the shuttle van’s fuel efficiency of 7MPG, and annual fuel savings estimate of $7,200. PennRoute’s environmental benefits include an annual reduction of carbon dioxide emissions by 16.056 tons and a large reduction in paper consumption.

PennRoute also reduces shuttle maintenance and labor cost and simplifies the process of new driver training. This system improves consistency in service quality and travel efficiency for students and faculty while providing a convenient and easy-to-navigate system for drivers.

View PennRoute's Feedback video featuring Penn Transit drivers – Watch Here

PennRoute won the Norman Gross Award of the Electrical and Systems Engineering (ESE) Senior Design Competition held on April 19, 2012, and First Honorable Mention in the School of Engineering and Applied Science Senior Design Project Competition held on April 27, 2012.

Press

PennRoute received the ESE department Norman Gross Award – Read More
SEAS Senior Design Project PennRoute presentation – Watch Here
The Daily Pennsylvanian reports on PennRoute – Read More
Penn Current features PennRoute – Read More

Additional Photos

*PennRoute tablet system has been successfully installed on Penn Transit shuttles and has received much positive feedback from Penn Transit, drivers, and passengers.*