Dynamic routing of busses

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INTRODUCTION

With environmental as well as financial incentives for its use, public transportation plays an ever important role in society. In the EU 60 billion passenger journeys were made in 2008 alone, according to the International Association of Public Transport (UITP, n.d.). Increased efficiency in the use of busses is therefore a important step in reducing oil consumption. This project investigates whether a bus fleet can be used more efficiently by using a demand responsive system. Instead of having static routes and time tables that busses follow, a customer would use an app or the web to order a bus to take her from her origin to her desired destination at a certain time. The operator then calculates which bus can serve the customer best and make sure that customer's request is incorporated in the ever-changing route of that bus. This dynamic solution to public transportation is used by Danish operator Movia with great success in the transportation of the elderly and handicapped, but has so far been deemed inappropriate for use in heavy traffic due to the fact that the quality achievable by current routing methods deteriorate when more people use the service.

THE PROJECT

In this project, a dynamic transportation system is simulated and the quality of the service with respect to travel time and oil consumption is compared with that of a static network. By introducing a completely new routing method that allows for people to transfer between busses, this project aims to greatly increase the quality of dynamic solutions in scenarios with a lot of demand on the service. Since this has earlier been the weakness of demand responsive transit systems, a solution to this problem could cause dynamic routing to outperform static bus systems in far more cases, fundamentally changing the way we will take the bus in the future.

ENVIRONMENTAL IMPACT

All modern bus fleets already have the equipment necessary to transform them into demand responsive transits. Furthermore, since the change is primarily software-based, research on this can immediately be applied world-wide. Even a small increase in efficiency can therefore get great consequences on the global scale, and great savings in oil consumption and CO_2 emissions can be obtained. This constitutes a crucial step on the path to a sustainable world.

REFERENCES

Public transportation in figures, (n.d). Retrieved May 16, 2012, from http://www.uitp.org/knowledge/Statistics.cfm