IATSS Research 38 (2014) 22–26

Contents lists available at ScienceDirect

IATSS Research

New prospects of transportation mobility

Cheng-Min Feng *

Department of Transportation and Logistics Management, National Chiao Tung University, 4 F, 118, Sec. 1, Chung Hsiao W. Rd., Taipei, 10044, Taiwan, ROC

ARTICLE INFO

Available online 21 May 2014

Keywords:
Instant
Sharing
Fast
Resilience
Financing
Seamless

ABSTRACT

The demand for improving the quality and efficiency of transportation service has been growing, and new technologies have been entering the market at a rapid pace. Creative thinking and approaches are increasingly important for governments in shaping their transportation policy and actions. This paper aims to discuss several challenges pertaining to the topic, including instant transportation, sharing transportation, fast transportation, resilient transportation, affordable transportation, and seamless transportation, and the lessons of several good practices taking place in Taiwan.

1. Introduction

Different needs lead to different solutions at different times. Travelers and drivers want to move more quickly, cheaply, safely, conveniently, comfortably, reliably, and with more information. Transportation operators want to provide service in a more efficient and profitable way. Regulators, meanwhile, look for less congestion, less pollution, and less energy consumption. However, the delays, energy consumption, and air pollution caused by congestion are all increasing, forcing governments to face mounting difficulties in funding transportation infrastructures to meet the demand. Conventional transportation concentrates on moving vehicles as efficiently as possible using strategies such as road construction, road improvement, and transportation system management (TSM). Recent objectives, though, have shifted the focus to transit-oriented and non-motorized sustainable transportation through transportation demand management (TDM) and intelligent transportation system (ITS).

These new trends in transportation do not correspond to new infrastructures or modes but rather mark a paradigm shift in innovative solutions to transportation problems and needs. Emerging challenges and prospects in transportation include the following: how to use and share facilities in a more effective way; how to employ new ICT technology to provide travelers with real-time information; how to introduce public–private partnerships and innovative financing schemes to build and operate infrastructures; how to adopt adaptation strategies to deal with the disruption caused by disasters; and how to promote seamless intermodal transportation. The purpose of this paper is to discuss these issues and examine the lessons of beneficial practices in Taiwan. The challenging prospects investigated herein include instant transportation, sharing transportation, fast transportation, resilient transportation, affordable transportation, and seamless transportation.

2. Instant transportation: Advanced traveler information services

A traveler dislikes uncertainty in his journey. If he could receive personalized, instant, and real-time traffic and public transportation information or solutions that help him make decision to reach his destination, he would have much less uncertainty to deal with. The Instant Mobility project in Europe is a good example of instant transportation, which aims to provide new ways to optimize urban traffic through a Web of online services [1]. Realizing the possibility of instant mobility requires comprehensive location and destination information for each traveler, location and status information for every possible transportation mode, and devices to collect, publish, and use this information based on user needs. Instant mobility is possible and feasible as an application of the recently popular “big data” concept.

In 2011, Taipei City launched a smartphone application called “Fun Travel in Taipei” (FTiT), a kind of instant transportation project that can provide the public with real-time and free-of-charge travel information. Although it does not collect and use information from each traveler, the application employs and integrates information for each public transportation mode. The information in FTiT includes real-time bus arrival times and bus travel times to destinations, travel speed on urban roads and expressways, incident information, locations of public parking lots and available parking spaces, mass rapid transit information, taxi information, river cruise information, public bike service stations and their real-time available spaces, and intercity real-time transportation information, including details for intercity railway,

* Fax: +886 2 2349 4965.
E-mail address: cmfeng@mail.nctu.edu.tw.

Peer review under responsibility of International Association of Traffic and Safety Sciences.

Production and hosting by Elsevier

http://dx.doi.org/10.1016/j.iatssr.2014.05.005

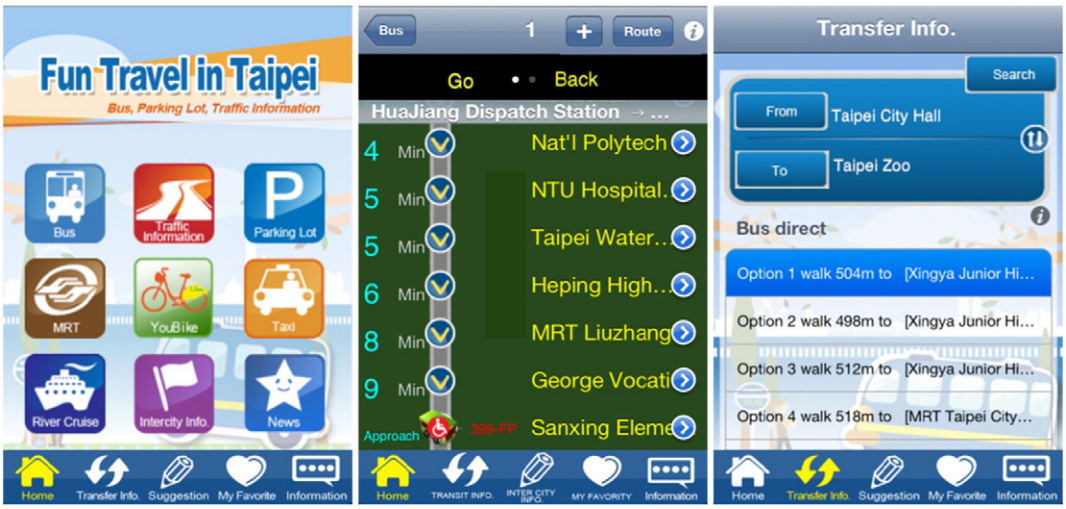

Fig. 1. Screenshots from the FTiT application in Taipei [2].

high-speed rail, and bus services (Fig. 1). Travelers can use FTiT to plan their journeys and reduce travel time. To meet the needs of different user groups, FTiT is available in the iOS, Android, and Windows Phone formats in both Chinese and English. The average monthly usage is 7.51 million logins in 2012, implying that FTiT has become a daily necessity for travelers in Taipei [2].

The FTiT project was funded by the Taipei City government and developed by the private sector. What makes FTiT particularly distinctive are its ability to integrate multimodal information, its provision of dynamic real-time travel information, and the public–private partnership behind the application. In 2013, the Eastern Asia Society for Transportation Studies (EASTS) named the FTiT project the "best transportation project in Asia."

The factors that contributed to the successful implementation of the FTiT project included the cooperation of the various mode operators, the smart integration of real-time information, the user-friendly application design, the free-of-charge usage framework, and the strong government commitment.

3. Sharing transportation: Bike-sharing systems

Though many people are in pursuit of faster speed, others advocate the idea of "slowing down" to improve quality of life. In fact, these seemingly opposite approaches may actually complement one other. For example, a fast train speeding along in the distance and a slow tramway and bike system in an urban or suburban area are both part of the contemporary lifestyle.

The bicycle is the healthiest and most energy-efficient transportation mode. As the idea of having to buy and own a bike might discourage people from riding bikes, bike sharing is a promising strategy for stimulating bike usage. In addition to allowing people to use public bikes from point A to point B without ever having to own a bicycle, public bike sharing can serve as both first- and last-mile solutions for other modes, particularly public transit. Many studies have indicated that bike-sharing programs cut down on the amounts of kilometers traveled and emissions generated by vehicles. There are now approximately 670 cities with bike-sharing systems in the world. The Wuhan and Hangzhou public bike-sharing programs in China are the largest, with about 90,000 and 60,000 bicycles, respectively. Paris has around 20,000 bicycles in its sharing network. Some programs are successful, while others are not.

The Taipei City government used the BOT (Build–Operate–Transfer) approach to work with world-renowned bicycle manufacturer Giant in establishing a bike-sharing project, the YouBike project, in eastern Taipei in 2009 (Fig. 2). The project now offers 3,600 bicycles, but it was by no means successful from the outset: the initial usage rate was only 1 bike per day. As a result of several measures, however, the usage rate has increased to 14 bikes per day. Project organizers have expanded service coverage, simplified registration, adjusted fares, and worked to make the riding environment safer. With the service area growing from eastern Taipei to Taipei City, bike rental stations have increased in number from 11 to 162. To make registration easier, organizers have made it possible to use a smartcard (bus/MRT) and a cellphone number to become a member at any YouBike station self-service kiosk, on the official YouBike Website, or at a YouBike service

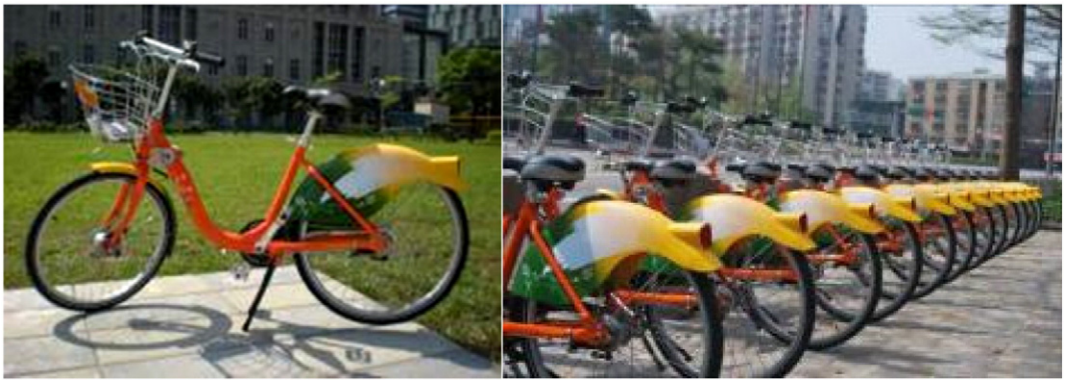

Fig. 2. YouBike in Taipei [3].