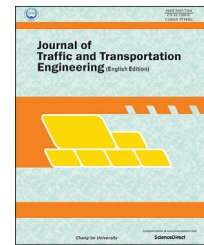


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Original Research Paper

Estimating commute-travel implications of telecommuting by female employees in Kuala Lumpur, Malaysia

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HIGHLIGHTS

- Considerable potential reduction in single occupancy vehicle (SOV) commute trips can be realized through telecommuting.
- The willingness of telecommuting among female employees is on the rise.
- Psychological and practical barriers preventing the adoption of telecommuting persist.
- A large gap exists between the potential and actual travel implications of telecommuting.

ARTICLE INFO

Article history:

Received 6 July 2017

Received in revised form

28 September 2017

Accepted 16 October 2017

Available online xxx

Keywords:

Travel implications

Telecommuting

Female employees

Single occupancy vehicle

ABSTRACT

A number of Malaysian cities are experiencing severe traffic congestion resulting from rapidly increasing vehicle ownership and usage, and the insufficient supply and inferior quality of public transport. The trend of congestion, frequent traffic accidents and air pollution is nowhere more prevalent in Kuala Lumpur where telecommuting is increasingly being perceived as a viable travel demand management strategy. Due to a number of unique travel characteristics of female commuters and the relatively large participation rate of women in the Malaysian work force, telecommuting by female employees seems a more relevant and potentially more crucial means of alleviating rush hour traffic in the Kuala Lumpur metropolitan area. The aim of this study is to estimate both the potential and actual travel implications of telecommuting by female employees. Therefore, this study is exploratory in nature as it mainly aims to explore the influence of the propagation of a phenomenon (i.e., telecommuting among female employees in Kuala Lumpur) on travel demand, and is thus mainly a quantitative research. The travel implications estimated in this paper include the reduction in commute trips, with a particular emphasis on the reduction in single occupancy vehicles (SOVs) entering the city of Kuala Lumpur during peak hours; vehicle and passenger-kilometers forgone; and time savings as a result of the elimination of the daily commute. The findings clearly show the potential of substantial reduction in vehicle and passenger-kilometers travelled, as well as potential time savings of more than 7000 employee-hours/day under an optimal adoption scenario. Furthermore, telecommuting by female employees could potentially result in a daily reduction of up to

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Peer review under responsibility of Periodical Offices of Chang'an University.

<https://doi.org/10.1016/j.jtte.2018.03.001>2095-7564/© 2018 Periodical Offices of Chang'an University. Publishing services by Elsevier B.V. on behalf of Owner. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).Please cite this article in press as: Jaff, M.M., Hamsa, A.A.K., Estimating commute-travel implications of telecommuting by female employees in Kuala Lumpur, Malaysia, Journal of Traffic and Transportation Engineering (English Edition) (2018), <https://doi.org/10.1016/j.jtte.2018.03.001>

7.8% of all SOVs entering Kuala Lumpur in 2019; however, there is a large gap between that potential reduction and the maximum actual reduction of 0.96%.

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1. Introduction

The benefits of promoting a telecommuting culture among female employees seemed to be promising at the outset of this study. Such benefits are to be gained at the personal level by the female employees who generally find telecommuting more attractive due to the flexibility it offers (Beasley et al., 2001; Mokhtarian et al., 1998) and due to the fact that compared to men, women experience more work/non-work role conflict and more career interruptions (Chapple and Weinberger, 1996; Schreiber, 1999). In addition, numerous studies asserted the presence of a “gender-gap” in travel behavior that makes women more inclined to adopt telecommuting as a viable working arrangement (Crane, 2007; Cristaldi, 2005; Ericksen, 1977; Goddard et al., 2006; Kawase, 2004; Law, 2002; Mauch and Taylor, 1998; Mokhtarian et al., 1998; Nobis and Lenz, 2004; Rosenbloom, 2006; Wachs, 1997).

Moreover, telecommuting by female employees in Kuala Lumpur can potentially result in reducing overall demand for travel that is consistently reported in existing literature (Hamsa and Rani, 2009; Mootaz and Hamsa, 2013). This benefit is of immense importance given the evidence from recently collected data by the authors which revealed that 45% of 454 sampled female employees commuted to work as a driver in a single occupancy vehicle (Barbour, 2006; Walls and Safirova, 2004), while only 16% used public transportation exclusively for their daily commute to work (Leong, 2010). In addition to the aforementioned points, the Malaysian government continuously promotes flexible working arrangements in general and telecommuting particularly among women as a means of both retaining them in the workforce, as well as enticing those who stopped working to return to the workforce. In fact the Malaysian Prime Minister has offered tax incentives to companies that establish nurseries and allow flexible work arrangements to encourage more women to resume their careers (Liau, 2014).

The purpose of this study is to estimate potential and actual commute-travel implications of telecommuting, with a particular emphasis on the reduction in single occupancy vehicles (SOVs) entering the city center. The potential travel implications will be estimated under optimal and conservative scenarios that were created based on data collected from 454 female employees working in Kuala Lumpur, while the actual reduction in SOVs trips was estimated based upon the growth in the adoption of telecommuting by female employees and the current status of telecommuting in the Malaysian capital. This study is essentially an appraisal of the viability of telecommuting by female employees as a

means of reducing the rush hour traffic in Kuala Lumpur (Barter, 2004).

2. Study methodology, data collection and analysis

This study is exploratory in nature as it mainly aims to explore the influence of the propagation of a phenomenon (i.e. telecommuting among women workers in Kuala Lumpur) on travel demand, and is thus mainly a quantitative research (Kitamura et al., 1991). A quantitative research design was chosen due to the fact that “quantitative research designs are well suited for identifying general trends.” (Gall et al., 1996). This study only considers full-day telecommuting due to the fact that it is the most prevalent form of telecommuting reported by respondents. According to data collected by the authors in the 2013 primary survey, only 1 of 454 respondents stated performing part-day telecommuting. Therefore it was difficult to assess the impact of part-day telecommuting with the given available data. In addition, the travel implications examined in this study are specifically commute-travel related. The authors could not ascertain the influence telecommuting exerts on non-mandatory travel, or non-commute travel. The phenomenon of compensating for the reduced commute travel by additional non-mandatory trips is reported in the literature (Asgari et al., 2016a; b), however it could not be verified by the researchers due to the fact that only 10 respondents (out of 454) reported practicing telecommuting. Observing changes in travel behavior of the 10 respondents may not provide generalizable findings. In addition, the actual female telecommuters were not known to the researchers beforehand, and thus it was impossible to collect travel-behavior data prior to the adoption of telecommuting that would help researchers identify the occurrence of compensatory travel once respondents began to telecommute. Therefore, the reduction in commute trips (by travel mode), reduction in vehicle and passenger-kilometers, and time savings were the only implications examined in the paper.

The target population is comprised of women who were employed in the financial intermediation and banking, real-estate, education, and telecommunication industries. The targeted respondents were employed as managers, professionals, associate professionals or clerical workers at the selected industries in the Kuala Lumpur city center. This sampling criteria was based on the findings of a telecommuting prevalence study in Malaysia in 1998. The study identified the selected industries and employment sectors as

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