

# 工作通勤旅次出發型態逐日演變下最佳號誌時制設計之研究

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## 摘要

在現代工作繁忙與講求時間效率的工商各行業中，工作通勤旅次強調時間準點的價值與日遽增，由於工作通勤旅次大都有到達時間的限制，但常因路網其他交通、路況、號誌控制等因素的影響，因而產生無法及時到達目的地的時間差。因此，通勤者會根據其可回憶的經驗，逐日調整通勤出發的時間，直到能在限制時間內到達工作點為止。

目前相關研究大都在探討出發時間調整的特性，甚少涉及號誌路網控制對出發型態的影響。道路交叉路口為各旅次路徑在平面路網上最重要的控制單元，當家戶至工作區域的交通型態隨著旅次出發的時間的變化而改變時，進出各號誌路口的車流型態也將產生不預期的變異，因而會影響各路口，甚至整個路網的績效，因此，如何在漸變的旅次出發型態下，使通勤時間成本降低與提高號誌時制的控制績效實為一重要課題。

本研究在不同的出發時間分配型態與逐日調整的概念下，分別探討號誌路網各節點採預設式、逐日調整式，以及穩定式時制所產生的績效，並由逐日通勤車流調整與號誌時制更新的交互影響，求得穩定狀態下的最適出發流量分配型態與各節點的號誌時制，最後再由敏感度分析獲致結論。

關鍵字：通勤旅次、逐日調整車流型態、號誌時制計畫、號誌路網

# **The Signal Timing Design Base on Evolved Day-to-Day Commuting Trip Patterns**

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## **Abstract**

In most fields of contemporary commerce and industry, time relating job's value and efficiency for workers is ever increasing. Complying with the scheduled arrival time at working site is strongly required for most commuters. Unfortunately, Due to the unexpected results of traffic and control conditions along a route, the commuters may sometimes reach their destination far ahead of or behind the schedule time. As a result, they would adjust the leaving times from their residential areas gradually according to the perceived experiences for the next days. The adjustment of leaving times for work will be continuing till the arrival times at sites are fulfilled.

Most of the existing research has focused on the evolvment of leaving times for work. Very few explored the consequences of a signalized network that may affect the pattern of leaving flow. The signals are the most control part for the traveling paths on a roadway network. As the home-based working trip patterns change due to the change in leaving times, the variation of flows entering and departing each signal result. This can also influence the output performance of individual signals, and even the whole network. Hence, how to reduce the commuters' time costs and upgrade the control performance at signals become an important issue that is worth while to be explored.

This study is intended to observe the associated effectiveness of different signal control timings, such as pre-timed, day-to-day adjusted, and asymptotic steady ones using the concept of daily flow evolvment under different leaving time distributions. With the mutual affection between the adjusted day-to-day leaving trips and the signal timing updates, the best home-sited leaving time patterns for commuters as well as the timing for each signals are found within an accepted time range. Several sensitivity tests are also conducted to reach conclusions and recommendations.

Keywords: commuting trip, evolved day-to-day flow patterns, signal timing plan, signalized network