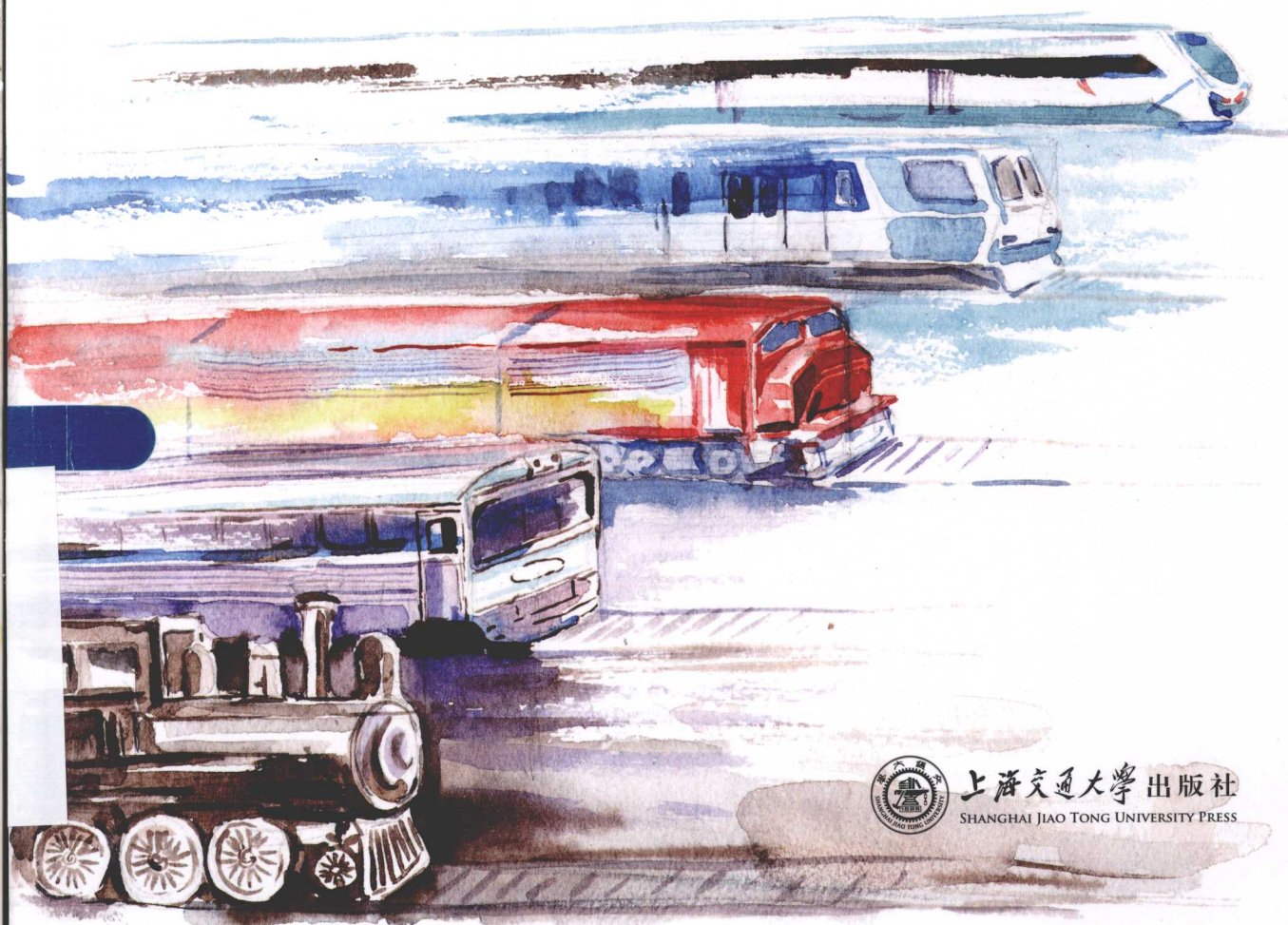


TRAFFIC ENGINEERING PROFESSIONAL ENGLISH

交通工程专业英语

谭家美 王岑屹 编



上海交通大学出版社
SHANGHAI JIAO TONG UNIVERSITY PRESS

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内容简介

本教材选取的课文主要针对近几年交通工程, 交通规划中的研究热点。读者可以据此了解交通工程与交通规划领域中新的发展趋势。

本书每一篇课文后面附有重要词句的解释, 还补充了部分专业词汇和例句的翻译练习, 这些练习有助于读者在学习的过程中掌握交通工程领域基本的、常用的词汇和句型, 熟悉本专业不同研究方向专业术语的英文表达方式。本书可作为交通工程专业本科高年级学生, 交通工程专业研究生的参考书籍。

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■ 前言

本书是在历年讲授《交通工程专业英语》这门课程讲义的基础上逐步形成的,是上海海事大学“085 工程”国际航运技术与管理专业建设及卓越工程人才培养项目资助规划教材。

本书一共节选了 15 篇近几年交通工程、交通规划中的研究热点,主要包括:

互联网、电子商务、先进的信息通信科技等新技术的广泛使用对人们出行的影响和冲击;时空地理学和时空透镜等从地理学角度延伸的方法对出行研究的影响;基于活动视角的社会学研究给传统交通工程、交通规划研究带来的影响;活动类型、出行链和出行链化对出行规划的影响;智能运输系统发展的新趋势、新内容;近年来兴起的出行合乘拼车,基于网络 and 手机等智能平台的动态共乘拼车等研究。同时,节选的译文还包括交通工程、交通规划与管理领域新的研究方法,如基于社会学角度的结构方程建模,多智能体仿真等。

部分节选译文篇幅较长,读者在参阅的基础上同时还可以了解交通工程与交通规划领域中新的研究趋势。每一篇译文后都附上了译文中重要词句的摘录和解释,每一篇译文还补充了部分专业词汇和例句的翻译练习,这些练习有助于读者在学习的过程中循序渐进地掌握交通工程领域基本的、常用的词汇和句型,熟悉本专业不同研究方向专业术语的英文表达方式。本书的译文和词汇共 15 章,章节与章节之间相互

独立,读者可以依据自己的兴趣选择阅读和学习。本书在最后详细列出了参考文献,感兴趣的读者可以根据所列参考文献查询和学习相关研究领域的热点问题。

本书在编写的过程中,得到了海事大学教务处和交通运输学院领导的大力支持,尤其感谢交通工程专业历届学生在这门课程教学过程中的反馈意见 and 建议,才促使这门课程的讲义在不断完善的过程中最终得以成书出版。最后还要感谢教务处唐金良老师在编书过程中的支持和帮助,感谢上海交通大学出版社潘新老师、腾飞老师、吴显沪老师在书籍出版过程中所给予的指导和帮助。

本书可作为交通工程专业本科高年级学生、交通工程专业研究生的参考书籍。

在阅读本书的过程中,欢迎来信提出宝贵建议和意见。

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Unit 1

Impacts of Internet Use upon Activity Participation and Travel*



Text

At the time of writing, two fields of transport research are in the ascendant. The first reflects technological change, considering the growth of new information and communications technology (ICT) and its impacts for transport systems and travel behavior. Whilst there has been debate about the impacts of ICTs for travel for some time (for example, *Salomon* identifies more than 30 papers on this subject in his 1986 review), the rapid growth in access to and use of the Internet in the late 1990s has provided added stimulus to this debate, for two principal reasons: because of the advanced capabilities of the Internet, unique amongst other ICTs; and because of its widespread adoption. For the first time, with the Internet, there is a technology truly capable of providing access to everyday activities, from education and employment to shopping and participation in social networks, without recourse to physical mobility by the individual undertaking the activity; and the Internet is truly popular and universally available (or, at least, statistics suggest that it is becoming so), entering homes, schools, the workplace and community venues.

The second reflects social change, considering the growth in inequality and disadvantage in society and the contribution of transport systems and travel behavior to the same. In the UK, the Labor government has popularized and prioritized the alleviation of social exclusion since its election in 1997. The publication by the Department for Environment, Transport and the Regions (DETR) in 2000 of a report into the links between social exclusion and the provision and availability of public transport placed transport firmly on the social exclusion agenda. Both reflecting and

* *Susan Kenyon. Centre for Health Services Studies, University of Kent, Canterbury, Kent CT2 7NF, UK. The impacts of Internet use upon activity participation and travel: Results from a longitudinal-diary-based panel study. Transportation Research Part C, 2010, 18: 21 – 35.*

promoting increased academic interest in the area, a government consultation into the links between transport and social exclusion was launched in 2001. The findings were published 2 years later and the principle of “accessibility planning”, which places a responsibility upon local authorities to assess and improve the accessibility of local services, is now a requirement of local government transport plans.

This paper reports aspects of a study which recognizes a potential link between these two fields; that the substitution of the need to travel through the provision of an alternative mode of access to activity participation, hypothesized in the first field of research, could alleviate the disadvantage caused by too little physical mobility, identified in the second. The research has sought to investigate this potential link, exploring the hypothesis that “virtual mobility”, via the Internet, could provide a viable alternative to physical mobility in reducing mobility-related social exclusion. To do so, virtual mobility must provide the same function as physical mobility, or, at the least, fill the gap that a lack of physical mobility leaves; and it must not have any negative mobility or social effects that might worsen social exclusion, thereby reducing the benefits of virtual mobility for mobility related exclusion. This paper reports results considering each of these factors.

The paper has as its focus data collected during a longitudinal, panel-based diary study, with a focus upon participation in primary activities only. Following an overview of the background to the research, the paper presents details of the methodology, data preparation and sample strategy and composition. The results and discussion follow. It was the intention to examine changes in behavior over time. However, no clear longitudinal trends were observed from these data. Therefore, analysis is for a composite sample. The possibility that virtual mobility is enabling greater activity participation is explored firstly through the analysis of difference by total weekly Internet use and secondly by total and offline participation rates for those participating offline only and those participating online, within each activity. Potential effects for both travel and social participation are considered. The paper concludes in support of the hypothesis that virtual mobility can provide a viable alternative to physical mobility in reducing aspects of mobility-related exclusion, by providing additional accessibility (virtual accessibility) without an increase in physical mobility. Furthermore, there is no evidence in this research to support a link between physical mobility and virtual mobility; and no evidence to suggest a negative effect of virtual mobility for sociability.

Discussion and conclusions

The analysis revealed the following:

- ◇ Internet use is associated with an increase in total participation, for education,

information search, shopping and social networks activities.

- ◇ Internet use is associated with an increase in offline participation, for education activities.
- ◇ Education, shopping and social networks activities are likely to be supplementary to their offline equivalents.
- ◇ Information search and, to an extent, shopping activities, are likely to substitute for their offline equivalents.
- ◇ To fully understand the impacts of Internet use for activity participation and personal travel, it is necessary to take an activity-specific and, where possible, individual task-specific focus.

Therefore, this study suggests that, for many activities, virtual mobility is providing additional access to activity participation. That there is a clear association between Internet use and an increase in activity participation, for the majority of activities considered, suggests a clear role for virtual mobility in social and transport policy, facilitating greater activity participation by supplementing existing participation and fulfilling latent demand. With regard to the possible negative effects of virtual mobility, the analyses have revealed the following: Internet use is not associated with physical mobility. There is no evidence to suggest that virtual mobility leads to an increase in physical mobility. Therefore, concerns regarding an increase in mobility-related exclusion, stemming from an increase in physical mobility as a result of virtual mobility, are not supported by this study.

Equally, however, in the main, there is no evidence to suggest a decrease in physical mobility through substitution. Therefore, the contribution of virtual mobility to decreasing mobility-related exclusion may be limited to its function in alleviating problems of too little mobility, not of too much.

Concerns regarding a decrease in sociability are not proven in this research. Internet use is not associated with a decline in sociability. Rather, online social networks activities supplement offline social networks activities, increasing total sociability.

The analysis of primary activities has produced valuable research findings. There are, however, caveats to the above results, which relate to the methodological approach and analytical design. It is to these that this paper now turns.

An acknowledged weakness of quantitative research is its inability to resolve questions of “why”. This research applied a longitudinal panel study because this is the clearest way in which the “why” questions can be addressed: the clearest way in which change can be assessed and causal factors attributed. However, the above findings are not the result of longitudinal analysis. As such, whilst online participation is associated with positive effects, we cannot definitively attribute causal effects. Similarly, in the

absence of longitudinal evidence, we can only suggest a substitutive or supplementary relationship. Whilst the email survey strongly suggests behavioral change as a result of Internet use, it is acknowledged that its reliance upon retrospective recall, not only of behavior but also of change, may affect its authority. In addition, the accessibility diary is not able to directly associate physical mobility with specific activities, prohibiting direct assessment of mobility effects. A future study intending to assess the activity-specific impacts of virtual mobility for activity participation and personal travel may consider such direct association essential in order to uncover the nature of relationships between the same.

Additional caveats are concerned with the unit of measurement, both in terms of taking a reference week and in terms of analysis by minutes, rather than by the number of discrete activities. It is possible that the above findings are influenced by the reference week recorded, such that time limited activity participation, or changes in activity participation that are time limited, each having substantial impact for quality of life, are not recognized. This study has highlighted the importance of the activity-specific, rather than generic, analysis of Internet effects. In light of the above and reflecting this, the appropriateness of this method for the measurement of activity participation (and change therein) in certain activities may be questioned.

The use of minutes as the unit of measurement is standard practice in the study of time use and has multiple benefits. However, it is possible that the number of minutes spent in an activity will actually decline with increasing proficiency or with faster connection and therefore that minutes may not accurately reflect the volume of activity participation or subsequent well being. Should this be the case, this will not only affect perception of change but also perception of the participatory benefits of virtual mobility, which may be greater than the above findings suggest.

Because a theoretical, non-representative sample was applied in this research, whilst neither significant nor substantial differences in behavior between sample subgroups were detected, the author is careful to acknowledge that the above findings are for this sample and may not be applicable to the general population. In addition, the substantial variation in behavior although commonly detected in time use studies is acknowledged as a caveat to the above findings and potentially reduces the ability to generalize the results. Returning to the sample, it emerged that the sample size and structure, designed for longitudinal analysis, was not (in the main) amenable to statistical analysis when applied to the composite database analysis. Whilst not negating the findings, this does reduce the extent to which they can be statistically verified.

Finally, that the findings are activity specific is strength of this analysis. However, the focus upon specific activities may also be considered to be a drawback. Activity participation decisions, including the decision to participate or not, are

interwoven within a daily schedule. This analysis has focused upon a small selection of activities that are important to this debate. It has not considered all daily activity, nor the importance of the scheduling of activities. Therefore, we do not know how Internet use is affecting participation in other activities in terms of both the gross participation in minutes and the interrelation of activities in the daily schedule. Should substitution/enhancement effects be apparent for other activities, it is possible that there may be an impact for personal travel and/or social exclusion. The aggregation of activities into broad categories may be disguising the same effects at the individual-activity level, with similar implications.

Quantitative micro level analysis is undesirable as mentioned previously, being unlikely to produce statistically valid findings, for which a much larger sample will be important. In addition, this paper has described methodological issues stemming from the diary design, which call the reliability of the user-led definition of primary/secondary activity into question and which prevent secondary activities being directly associated with primary activities in the daily schedule. Further analysis of these data, for example involving modeling software, is therefore scientifically problematic. However, some less statistically rigorous analysis aiming to uncover associations is possible. Future application of these results to testing with a larger sample could provide important conclusions. All data have been made available to the community, online, to allow this analysis.

The aim of the above discussion is not to repudiate the findings reported in this paper, but to place them in context. In taking a unique, activity-specific approach to the assessment of the impacts of virtual mobility for activity participation and personal travel, this study has moved beyond conventional debate to embrace the complexity of the interactions between the same. The study has produced valuable empirical and methodological findings, contributing towards understanding in the field of study on each of these levels.



I. Notes

1. A technology truly capable of providing access to everyday activities, from education and employment to shopping and participation in social networks.
(交通运输)是一种能够为教育、就业、购物和社交等日常活动(参与)提供可达性的技术。
2. A clear association between Internet use and an increase in activity participation.
互联网使用和日益增加的活动参与之间的显著联系。
3. Activity participation decisions, including the decision to participate or not, are interwoven within a daily schedule.
活动参与决策,包括是否参与,都在每天的活动安排中交织。

4. The aggregation of activities into broad categories may be disguising the same effects at the individual-activity level.

活动类型的广义分类(集计)有可能掩盖其个体层次方面的差异。

5. Quantitative micro level analysis is undesirable.

微观层面的定量分析是不可取的。



II. Words and Expressions

1. two fields of transport research: 交通运输研究的两个领域
field: *n.* 学习或研究的领域
2. be in the ascendant: (习惯用语)占优势,蒸蒸日上;青云直上
ascendant: *adj.* 上升的
E. g. After the election, our political party was once again in the ascendant.
3. information and communications technology(ICT): 信息通信技术
4. travel behavior: 出行行为
5. stimulus to this debate: 导致争论的原因
stimulus: *n.* 刺激物;激励物;促进因素
6. for two principal reasons: 由于两方面主要原因
principal: *adj.* 最重要的;主要的
7. the advanced capabilities of the Internet: 互联网的先进功能
8. widespread adoption: 广泛采纳,广泛采用
9. physical mobility: 身体活动,物理活动,物理位移
10. community venues: 社区的场地
venue: *n.* 聚集地点;会场;(尤指)体育比赛场所
E. g. Completed infrastructure and supporting facilities will be available for each venue.
11. the growth in inequality and disadvantage in society: 社会不平等和弊端的增长
12. the contribution of transport systems: 交通运输系统的贡献
13. academic interest in the area: 该领域的学术焦点
14. accessibility planning: 可达性规划
accessibility: *n.* 可达性
E. g. to assess and improve the accessibility of local services
Ready provision of reliable, up-to-date and accurate transport information contributes towards efficient road use, better traffic flow, greater road safety and improved accessibility in the city.
15. the accessibility of local services: 当地服务设施的可达性
16. a potential link: 潜在的联接,潜在的关联
17. an alternative mode of access to activity participation: 参与活动的替代方式
18. a viable alternative to physical mobility: 一个可行的出行替代方案

viable *adj.* 切实可行的;可实施的

E.g. a viable alternative: 一个可行的替代方案

The scheme is economically viable.

Traditional values in our heritage that are proven viable should be retained and developed into new values needed for the future.

19. a longitudinal, panel-based diary study: 纵向面板数据分析

20. methodology: *n.* 方法

21. data preparation: 数据准备

22. activity participation: 活动参与

23. in support of the hypothesis: 支持假设

24. latent demand: 潜在需求;隐性需求

25. with regard to the possible negative effects: 关于可能产生的负面影响
positive effects: 正面效用;正面影响

26. reveal: *vt.* 揭示;显现;显示;显露

27. caveats to the above results: 对于上述结果的附加说明
caveat: *n.* 警告,附加说明

E.g. But there is a sobering caveat: drinking too much may make you dimmer.

28. quantitative research: 量化研究

29. a longitudinal panel study: 纵向面板(数据)研究

30. The “why” questions can be addressed: “为什么”的问题可以得到解决

31. a substitutive or supplementary relationship: 替代或互补的关系

32. a theoretical, non-representative sample: 理论性、非代表性的样本

33. sample subgroups: 样本亚群

34. general population: 总人口

35. longitudinal analysis: 纵向分析

36. to produce statistically valid findings: 产生有效的统计结果

37. stem from: (= originate from)起源于;来源于

38. primary/secondary activity: 主要活动,次要活动

39. repudiate: *vt.* 否认,否定

E.g. We must firmly repudiate these wrong ideas and check their spread.

40. activity-specific approach: 以特定活动为对象的方法

41. valuable empirical and methodological findings: 宝贵的、有关实证和方法论的研究成果
empirical: *adj.* 以观察或实验为依据的

E.g. We now have empirical evidence that the moon is covered with dust.

The empirical skeptic appropriately responds: how do you know?



III. Technical Terms

⇒ bitumen: 沥青

E. g. A natural black bitumen is used in the manufacture of acid, alkali, and waterproof coatings.

In Ancient Egypt, when a poor person died, his body was merely enclosed in a thick layer of bitumen to keep out the air.

- ⇒ demand curve: 需求曲线
- ⇒ economic benefits analysis: 经济效益分析
- ⇒ glare screen: 防眩设施
- ⇒ Kalman filter, Kalman filtering: 卡尔曼滤波
- ⇒ object marking: 障碍物标示线, 指以规定的线条、箭头、文字、立面标记、突起路标或其他导向装置, 划于路面或其他设施上, 用以管制引导交通和分散交通流的设施。它将道路的种种固定基础情报传达给车辆和行人, 特别是对驾驶员尤为重要。
- ⇒ Cantilever Bridges: 悬臂式桥梁, 指以一端或两端向外自由悬出的简支梁作为上部结构主要承重构件的梁桥。悬臂梁桥有单悬臂梁和双悬臂梁两种。
- ⇒ Rainfall Intensity: 降雨强度
- ⇒ Improving Highway Traffic Order and Safety Projects: 道路交通秩序与交通安全改进方案
- ⇒ Park and Ride system: 停车换乘系统
- ⇒ headwater depth: 上水深。“上水”一词的意思是上游水域。
- ⇒ latent travel demand: 潜在出行需求
- ⇒ queuing system: 等候系统; 排队系统
- ⇒ Bus Rapid Transit: 公车捷运
- ⇒ minimum sight triangle: 最小视距三角形
- ⇒ natural ventilation: 自然通风



IV. Exercises: Translate the following sentences into Chinese, paying attention to the *Italic words*

1. Density of traffic

First is free flow in which the density of traffic is low enough to allow vehicles to travel at the maximum speed.

2. Emergency evacuation

In addition, an emergency evacuation preparedness zone was also identified in which residents were asked to prepare their affairs in case they were asked to evacuate.

3. Graphical analysis

According to the specialty of the vehicle body's data measured by 3D coordinate measuring machine, a method of computer graphical analysis is proposed, and the design of the software is introduced.

4. Highway alignment design

At the highway alignment design, the designer with no rules cannot control plane

and vertical alignment combination of road horizontal and vertical alignment design.

5. Bridge expansion joint

But how to estimate and maintain the bridge expansion joint is an urgent problem to be solved by the manage department of the highway.

6. Lane line

The road line detection is very important in vision navigation system of intelligent vehicle. The lane line detection should not be ignored in independence navigation.

7. Minimum curve radius

The minimum curve radius of the high speed truck is recommended when using forced-steering truck. Optimum parameters of forced-steering mechanism are analyzed.

8. Navigation

However, since it performs module switching by launching other modules and is an integral part of the navigation structure, we include it here as well.

9. Questionnaire

From the answers to the questionnaire, identify areas for further information requirements and schedule follow-up interviews with key personnel.

10. Sensors

In a car, where the occupants are sitting in known positions, the airbags can be deployed at the optimum time after sensors detect an impact.

11. Driving simulator

Drivers' steering reaction time in traffic accidents is significant to drivers' reliability and reasons of traffic accidents. In this paper, the linearity regression has been used to construct the model based on the data got from questionnaires, drivers' static indexes (deepness aesthesia, attention centrality, attention assignment) and steering reaction time of drivers upon the driving simulator, and also proved to the validity of the model through data check-up.

12. Elevated highway road

The elevated highway road is an effective way to solve transportation problems, whereas it affects city landscape. It is an important question for urban planners to seek a reasonable breakthrough point to decrease negative problems brought by elevated highway road.

13. High occupancy vehicle lane

High occupancy vehicle (HOV) lane, which are reserved for vehicles with more than a pre-determined number of occupants, have been developed for decades as a part of the roadway network system to relieve pressures from ever-increasing travel demands; an effective and environmentally friendly approach to improve

the mobility and productivity of freeway systems in metropolitan areas.

14. Intelligence Transportation System

ITS is "Intelligence Transportation System" for short, which synthetically applies advanced information technology, data communication transit technology, electronic control technology and computer processing technology to the whole traffic management system, establishes prompt, accurate, highly effective integrated transportation management system, and make transportation service and management intellectualized finally.

15. Joint reinforced concrete pavement (JRCP)

With consideration of the characteristics of coal transport vehicles with heavy axle loading, high tire pressure and multiple axles in Shanxi Province, by applying a model of multi-layer structure on an elastic foundation, the loading stresses and thermal stresses in plain concrete pavement (PCP) structure combination at testing segment were discussed, the steel bar rates for joint reinforced concrete pavement (JRCP) and continuously reinforced concrete pavement (CRCP) were listed, and the fatigue lives of different types of structure combination at testing segment were predicted.

Unit 2

Lifestyle Classifications with and without Activity-travel Patterns*



Text

Activity-based modeling approach has made significant progress towards a more realistic representation of individual and household travel behaviors since 1970s. Compared with the traditional trip-based travel demand models, activity-based travel models help to understand and predict individual travel behavior in response to household factors changes (household socio-demographics; household structure; number of household member; number of elderly and child; etc.) and non-household factors changes (urban form; socio-environment; technology; travel management policies; etc.). From a transportation and regional planning perspective, it is obvious that a well developed activity-based travel demand forecast model is critical to the land use design and transportation planning. Due to the potential heterogeneous responses to transportation policy and land use plan and the existence of various lifestyles in a population, it is often advantageous to first divide individuals of a study area to several lifestyle clusters before the development of separate activity-based travel demand models such as activity generation, location selection, modal split, etc. for each cluster.

Three methods have been used in the past to classify individuals into distinct travel/activity-related lifestyle groups. All these three methods adopt cluster analysis but differ in what they cluster on. The earliest one identifies, using cluster analysis only, distinct lifestyle groups based on individual and household socio-economic and demographic characteristics such as household structure, work participation, and housing type. The second method, which has become more popular recently, is

* Hong-Zhi Lin, Hing-Po Lo, Xiao-Jian Chen. Department of Management Sciences, City University of Hong Kong, Hong Kong, PR China. School of Management, University of Science and Technology of China, Hefei, Anhui, PR China. Lifestyle classifications with and without activity-travel patterns. *Transportation Research Part A*, 2009, 43: 626-638.