

Appendix A: The independent variables included in the multivariate analyses

Independent variable	Pre-assumed effects on travel behavior	Arguments for including the variable in the analysis
Location of the residence relative to downtown Hangzhou (non-linear transformation of the distance along the road network)	Longer travel distances in total, by car and by public transport, and shorter by non-motorized modes among outer-area residents. Higher proportion traveled by car and lower proportion by walk/bike. Yet reduced effects at long distances from downtown, and maybe somewhat lower amount of travel in the very most peripheral areas	Urban structural variable of primary interest in this investigation. Not a control variable
Logarithm of the distance from the residence to the closest second-order urban center	Longer travel distances in total, by car and by public transport, and shorter by non-motorized modes among those living far from a second-order center. Higher proportion traveled by car and lower proportion by walk/bike.	Urban structural variable of primary interest in this investigation. Not a control variable
Logarithm of the distance from the residence to the closest third-order urban center	Longer travel distances in total and by car, and shorter by public transport among those living far from third-order center. Higher proportion traveled by car. Maybe also more travel by non-motorized modes (in order to reach the local service facilities located close to it)	Urban structural variable of primary interest in this investigation. Not a control variable
Sex (female = 1, male = 0)	Shorter travel distances in total and by car among women than among men. Higher proportions of public transport and walk/bike	The proportions of men and women among respondents varies somewhat between the areas. Besides, enables comparison of urban structural and demographic variables, and across population groups
Age	Shorter travel distances in total and by car, and lower proportion of car travel among old people	Age distribution varies between the residential areas, among others with a higher proportion of young people in the inner city. Besides, enables comparison of urban structural and demographic variables
Number of household members below 7 years of age	Shorter travel distances in total and by public transport, a higher proportion traveled by car and a lower proportion by public transport if there are small children in the household. Ambiguous expectations regarding travel by walk/bike	Number of children varies between the areas, among others with fewer children in the inner city and large local variations in outer areas. Besides, enables comparison of urban structural and demographic variables, and across population groups
Number of household members aged 7 - 17	Shorter travel distances by public transport, a higher proportion traveled by car and a lower proportion by public transport if there are schoolchildren in the household. Maybe also a lower proportion of walk/bike. Ambiguous expectations regarding the total travel distance	Same as for the previous variable

Workforce participation (yes = 1, no = 0)	Longer travel distances in total, by car and by public transport among workforce participants. Ambiguous expectations regarding the modal split and the distance traveled by walk/bike	The proportion of workforce participants varies between the areas. Besides, enables comparison of urban structural and demographic variables, and across population groups
Student/pupil (yes = 1, no = 0)	Shorter travel distances by car and longer by public transport and walk/bike among students/pupils, with corresponding effects on the modal split. Ambiguous expectations regarding the total travel distance	The proportion of students/pupils varies between the areas, with considerably higher shares in the inner city. Besides, enables comparison of urban structural and demographic variables, and across population groups
Pensioner (yes = 1, no = 0)	Somewhat shorter total travel distance. Ambiguous expectations regarding the modal split and the distances traveled by the various modes	The proportion of pensioners varies between the areas. Besides, enables comparison of urban structural and demographic variables, and across population groups
Personal annual income (1000 yuan renminbi)	Longer travel distances in total and by car, and a higher proportion traveled by car, when income is high. Lower <i>proportions</i> of public and non-motorized transport.	Income levels vary considerably between the areas. Besides, enables comparison of urban structural and demographic variables, and across population groups
Whether the respondent holds a driver's license for car (yes = 1, no = 0)	Longer travel distances in total and by car, and a higher proportion traveled by car among those who hold a driver's license. Shorter distance traveled by public transport and a lower proportion of this mode. Maybe somewhat more walk/bike travel, as these modes, alike with the car, are individual and provide some of the same flexibility	The proportion holding a driver's license varies between the areas. Arguably though, the part of this variation which is not due to factors already included as variables in the analysis may to a high extent be a result of urban structural conditions, and should therefore perhaps not be controlled for.
Availability of a private car in the household	Longer travel distances in total and by car, and a higher proportion traveled by car if one or more cars is available in the household. Shorter distance traveled by public transport and walk/bike, and lower proportions of these modes.	Car ownership varies between the areas. Arguably though, the part of this variation which is not due to factors already included as variables in the analysis may to some extent be a result of urban structural conditions, and should therefore perhaps not be controlled for.
Education level (professional secondary school or higher levels = 1, otherwise 0)	Longer travel distances in total, by car and by public transport among those with a long technical or economic education, maybe also a lower proportion of walk/bike	The dominating levels and types of education varies between the areas. Besides, enables comparison of urban structural and demographic variables, and across population groups
Index for attitudes to transport issues (high value = car-oriented attitudes)	Longer travel distances in total and by car, and shorter by public transport and walk/bike among those with car-oriented attitudes. Also a higher proportion of car travel and lower proportions of public transport and non-motorized modes.	Transport attitudes vary between the areas, and this may imply self-selection of residents into neighborhoods matching their travel preferences. Arguably though, the part of this variation which is not due to factors already included as variables in the analysis may to a high extent be a result of urban structural conditions, and should therefore perhaps not be controlled for.

Index for attitudes to environmental issues (high value = environmentally oriented attitudes)	Shorter travel distances in total and by car, and longer by non-motorized modes among those with environmentally oriented attitudes. Also a lower proportion of car travel and a higher proportion of walk/bike	Same as for the previous variable
Residential preferences (mentioning proximity to public transport, workplace and/or shopping opportunities important residential choice criteria = 1, otherwise 0)	Shorter travel distances and less car driving among respondents emphasizing proximity to daily destinations and public transport stops as important residential choice criteria.	Residential preferences may vary between the areas, and this may imply self-selection of residents into neighborhoods matching their travel preferences.
Regular transport of children to school or kindergarten (yes = 1, no = 0)	Longer travel distance by car, a higher proportion traveled by car and a lower proportion by public transport among those who bring children regularly. Maybe also somewhat longer total travel distance. Ambiguous expectations regarding the distance by walk/bike and the proportion of such travel	The proportions with such responsibilities vary between the areas, maybe in a way different from the variation in the number of children in the households.
Overnight stays away from home more than three nights during the investigated week (yes = 1, no = 0)	Longer travel distances in total, by car and by public transport, and a lower proportion of walk/bike among those who have many overnight stays away from home	A sort of "noise" which it might be desirable to eliminate in the estimation of the effects of the other variables.
Official trips during the investigated week (yes = 1, no = 0)	Longer travel distances in total, by car and by public transport, and a lower proportion of walk/bike among those who have carried out official trips	A sort of "noise" which it might be desirable to eliminate in the estimation of the effects of the other variables.
Has moved to the present dwelling less than five years ago (yes = 1, no = 0)	Longer total travel distance for all modes (in particular in weekends) among those who have moved. Also more travel by car and public transport, and less by non-motorized modes	The proportion who has moved is likely to vary between the areas (some areas are more characterized by turnover than other areas)

Appendix B: Contributions of various rationales for location of activities to the relationships between residential location and travel

<i>Rationales for activity location</i>	<i>Frequency of occurrence</i>	<i>Influence on activity location</i>	<i>Influence on the relationship between the amount of travel and the distance from the dwelling to the main center of the metropolitan area</i>	<i>Influence on the relationship between the amount of travel and the distance from the dwelling to local facilities</i>
Choosing facilities where the instrumental purpose of the activities can best be met	Emphasized by nearly all interviewees, but its importance varies between activity types and between individuals (Indicated in 25 interviews)	Tends to make the interviewees consider a large number of facilities within each facility category as potential locations of their activities, regardless of the distance from the dwelling to these facilities (as long as some quite wide threshold distance is not exceeded).	Contributes strongly to this relationship by increasing the likelihood of traveling to the large concentration of facilities in the inner parts of the metropolitan area, but also because of downtown's role as an approximate point of gravity for all peripheral destinations.	Contributes to a certain weakening of this relationship by increasing the likelihood of choosing distant facilities rather than local ones
Choosing facilities where social contacts can be maintained	Emphasized by several interviewees as a criterion for choosing which teahouses, restaurants etc. to visit. (Indicated in 11 interviews)	Tends to make interviewees choose facilities not only based on their own preferences, but on the common preferences (in terms of accessibility, quality criteria etc.) of a group of friends.	Contributes somewhat to strengthen this relationship because of downtown's role as an approximate point of gravity for the housing stock and its high accessibility by public transport.	May contribute somewhat to strengthen this relationship insofar as the groups of friends who decide to meet at teahouses etc. live in the same local district.
Choosing facilities matching the interviewees' cultural, esthetic and symbolic preferences	Emphasized by several interviewees as a criterion for location of leisure activities and also sometimes shopping. (Indicated in 10 interviews)	Tends to make interviewees choose certain picturesque, reputable or historically interesting areas as locations for leisure and shopping activities. These areas are to a high extent located around the West Lake and in the historical core of the city of Hangzhou.	Contributes somewhat to strengthen this relationship because several of the culturally, esthetic and symbolically most attractive areas are either located close to the downtown area or at locations easier accessible from the inner city of Hangzhou than from most of the outer parts of the metropolitan area.	Contributes to a certain weakening of this relationship by increasing the likelihood of choosing distant facilities rather than local ones
Variety-seeking	Mentioned or indicated by some interviewees as a reason for shifting between different recreational areas or supermarkets. (Indicated in 4 interviews)	Combined with rationales of choosing the best facility', variety-seeking tends to make interviewees sometimes choose more distant facilities than the closest one matching the interviewee's quality criteria.	Since a large number of alternative facilities can usually be found close to the dwellings of inner-city residents, variety-seeking is not likely to imply significantly increasing traveling distances among these residents. Due to the lower density of facilities in the outer parts of the metropolitan area, the variety-seeking of outer-area residents is more likely to imply increased traveling distances. The variety-seeking rationale thus probably contributes to a slight strengthening of the relationship between the amount of non-work travel and the distance from the dwelling to the main center of the metropolitan area.	By making interviewees sometimes choose more distant locations than what they would otherwise have done, variety-seeking tends to reduce the use of local facilities and thus tends to weaken the relationship between the amount of non-work travel and the distance from the dwelling to the closest local center.

Minimizing the spatial traveling distance	Emphasized by nearly all interviewees, in particular those without a car. Thresholds for acceptable distances vary between activity types and between individuals (Indicated in 25 interviews)	Tends to make the interviewees limit their choices of facilities for a given type of activity to those facilities which are accessible within a certain geographical radius, and to choose the closest facility meeting his/her quality criteria. Threshold distances are usually widest for workplaces and shortest for daily necessity shopping.	Contributes to some extent to this relationship, both because the facilities in the central districts of Hangzhou are the closest opportunities for inner-city residents, and because of the shortage of facilities in the periphery	Contributes strongly to this relationship by increasing the likelihood of choosing local facilities rather than more distant ones
Minimizing travel time	Although mentioned explicitly only by a few interviewees, time saving is probably of quite general importance as a sub-rationale contributing (together with distance minimizing) to minimizing the friction of distance. Thresholds for acceptable time consumption vary between activity types and between individuals (Indicated in 3 interviews)	Tends to make the interviewees limit their choices among facilities for a given type of activity to those facilities which are accessible within a certain travel time, and to choose the facility meeting his/her quality criteria which can be reached with the least time consumption. Thresholds for travel time are usually widest for workplaces and shortest for daily necessity shopping.	May induce some car drivers to choose, e.g., large suburban supermarkets instead of central-city shops. Contributes nevertheless to some extent to the relationship between the distance from the residence to downtown and the amount of travel, due to the function of the urban center as geographical point of gravity	Contributes to this relationship because it will usually take a short time to go to local facilities. But because travel speeds by car will often be higher when going to e.g. a more distant shopping mall with ample parking space, the influence of this rationale is not as strong as the influence of the rationale of limiting geographical distances
Minimizing the stress or physical efforts of traveling to the destination	Emphasized in particular among interviewees who do not have any private motorized vehicle at their disposal. (Indicated in 7 interviews)	Tends to make interviewees traveling by non-motorized modes limit their traveling distances, and to make interviewees traveling by public transport avoid destinations necessitating several and/or cumbersome shifts between different public transport lines.	Tends to weaken this relationship somewhat by increasing the propensity of suburbanites without a car at their disposal – in particular those living in areas with poor public transport services – to limit their choices among facilities to those available locally.	Contributes to this relationship by increasing the likelihood of choosing local facilities rather than more distant ones.
Minimizing economic expenses associated with the trip	Not mentioned explicitly in any of the interviews, but it is hard to imagine that this does not play some role as a sub-rationale contributing to minimizing the friction of distance, e.g. by limiting the frequency of long leisure trips. (Indicated in 0 interviews)	Tends to make interviewees use facilities within walking or biking distance to a higher extent than what they would otherwise do, and to choose destinations for car trips where it is not necessary to pay high parking fees. Contributes also somewhat to a general limitation of traveling distances by motorized modes.	May induce some car drivers to choose, e.g., suburban stores and leisure facilities instead of downtown facilities. Contributes nevertheless to some extent to this relationship, both because the facilities in the central districts of Hangzhou are the closest opportunities for inner-city residents, and because of the shortage of facilities in the periphery.	Contributes clearly to this relationship because local facilities will usually be the ones that can be reached with the smallest economic expenses.