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Research Report

Review of the Montevideo Home Mobility Survey

Report 2, iCity SOUTH

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iCITY-SOUTH:
Urban Informatics for Sustainable Metropolitan Growth in Latin America

REPORT 2:
REVIEW OF THE MONTEVIDEO HOME MOBILITY SURVEY

A report to CAF, the Development Bank of Latin America.

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EXECUTIVE SUMMARY

The purpose of this study is to discuss the recently completed Montevideo Home Mobility Survey (MHMS). This is done in two parts. First, an overview and discussion of the MHMS design and execution and the implications of these findings for the use of home-interview surveys in Latin American cities is presented. Second the report presents a high-level discussion of the use of the MHMS dataset in the development of an advanced model of activity/travel for the Montevideo urban region. In summary, the MHMS is found to be a high-quality, well-executed home interview survey which provides considerable useful information for transportation and modelling purposes in the Montevideo urban region. Its major limitation is its relatively small sample size, which limits the spatial scale at which origin-destination trip matrices can be constructed. The disaggregate survey records, however, are well suited for the development of an agent-based microsimulation model of travel demand in the region, especially of the MHMS data are supplemented with large, multi-day/week samples of transit smartcard and cellphone CDR data, both of which are available within the Montevideo region.

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STUDY PURPOSE & MOTIVATION

Urban regions with Latin America (and elsewhere) face enormous challenges in terms of the provision of transportation infrastructure and services to meet the travel needs of their growing population in a cost-effective, equitable and sustainable manner. High quality, comprehensive information concerning travel behaviour and transportation system performance is a fundamental prerequisite for successful urban transportation planning and decision-making to address these pressing, first-order needs.

In recognition of this need, CAF established the Urban Mobility Observatory (OMU, *Observatorio de Movilidad Urbana*)[1] to assemble and utilize standardized transportation-related data for Latin American cities. 29 cities are currently members of OMU. Collecting consistent, time-series data for these cities, however, is a difficult and costly task for CAF and its partner cities.

At the same time, exciting, new transportation data collection sources are emerging to complement or even replace the traditional methods used to collect the OMU data. These include:

- The pervasive penetration of cellphone and smartphone technology within urban populations.
- The widespread adoption of smartcard systems by public transit agencies in many cities.
- Extensive deployment of many types of sensors (video, thermal, Bluetooth, etc.) for monitoring travel flows.
- Increasing availability of very large (typically crowd-sourced) datasets collected in a variety of ways by private sector companies (Google, Waze, Inrix, etc.) that can provide travel information.
- Web-based survey methods to complement/replace traditional survey methods such as home-interviews, telephone interviews, etc.

In 2015, the University of Toronto Transportation Research Institute (UTTRI) launched the *iCity* research program, which is dedicated to applying modern *urban informatics* (the combination of data collection, data science, modelling, visualization and high-performance computing methods) to the promotion of sustainable metropolitan growth. As one component of CAF's strategy for promoting its urban sustainable mobility objectives, it has partnered with UTTRI to create the *iCity-South* research program to apply the *iCity* urban informatics vision and capabilities in Latin American cities.

Two initial projects were chosen to launch the *iCity-South* research program. One involves the demonstration of agent-based microsimulation methods for modelling urban travel demand in terms of developing a prototype microsimulation model for Asunción, Paraguay.[2] The second is

[1] https://www.caf.com/es/temas/o/observatorio-de-movilidad-urbana/
[2] This project was completed in April, 2017. See Miller, et al., (2017a, 2017b) for the results of this project.

investigating traditional and new data collection methods in Montevideo, Uruguay. This report is the second in a series of reports documenting the Montevideo project results.

This report provides a discussion of the recently completed Montevideo Home Mobility Survey (MHMS). In addition to this brief introduction, this report consists of two chapters. Chapter 2 contains an overview and discussion of the MHMS design and execution and the implications of these findings for the use of home-interview surveys in Latin American cities. Chapter 3 then presents a high-level discussion of the use of the MHMS dataset in the development of an advanced model of activity/travel for the Montevideo urban region. The focus of this report is specifically on the MHMS. For a more general discussion of the strengths, weaknesses and applications of home-interview surveys in the Latin American context, see Miller and Habib (2017).

CHAPTER 2
THE MONTEVIDEO HOME MOBILITY SURVEY

2.1 INTRODUCTION

This chapter provides a very brief overview of the 2016 Montevideo Home Mobility Survey (MHMS), summarizes the UTTRI iCity-South project team's contribution to the design of the survey, and discusses key issues in the design, conduct and use of home interview surveys such as the MHMS.

2.2 MHMS OVERVIEW

The 2016 Montevideo Home Mobility Survey (MHMS) was designed and executed by the Municipal governments of the Metropolitan Area of Montevideo and the Universidad de la República (Udelar) under funding from CAF. It is a classic home interview survey in which trained interviewers survey randomly selected households in their homes. The survey questionnaire is shown in Appendix I. The survey was conducted during the period of August-October 2016. The survey study area consisted of the entire AMM as illustrated in Figure 2.1. In total, 2,230 households and 5,946 persons within these households were interviewed, representing a 0.34% sample of the approximately 656,000 households (1,807,000 persons) within the survey study area (based on 2011 Census data). The survey and key results are extensively documented in the July, 2017 report, *Encuesta de movilidad en el Área Metropolitana de Montevideo 2016, Principales resultados e indicadores.* All figures, tables and statistics presented in this chapter are from this report, unless otherwise indicated.

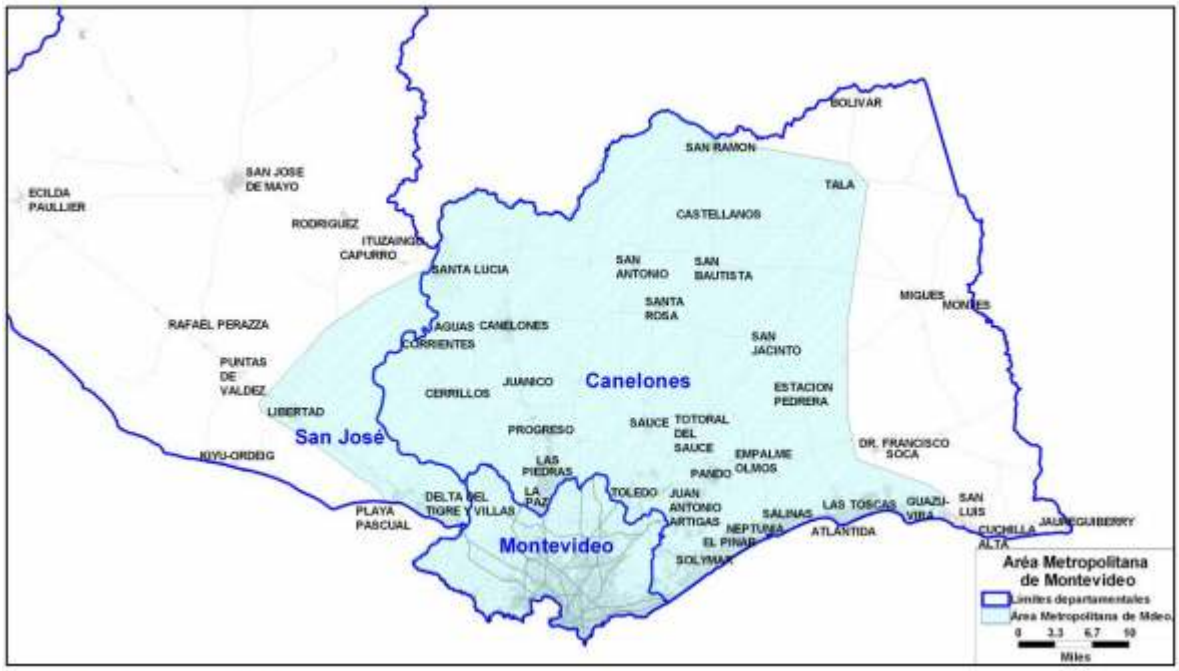


Figura 1. Marco muestral

Figure 2.1: MHMS Study Area.

2.3 iCITY-SOUTH INVOLVEMENT IN THE SURVEY DESIGN

The UTTRI iCity-South project team reviewed the draft design of the survey questionnaire in December, 2015. We found the MHMS to be a very well-designed survey, but we were also able to provide some suggestions to the MHMS design team concerning possible minor changes in the wording of several questions, as well as the general layout of the questionnaire, as documented in Appendix II.

The iCity-South team also had an opportunity to further discuss the survey design with the MHMS design team while it was in pilot testing during our first project visit to Montevideo in early June, 2016. These discussions confirmed the quality of the survey design and care with which the survey was being implemented in the field.

2.4 REVIEW OF MHMS RESULTS

As noted above, the primary results have been well summarized in the *Principales resultados e indicadores* report; these will not be reiterated herein. Issues of interest that are not discussed in this report include:

- Definition of traffic zones.
- The spatial distribution of the respondents.
- The socio-economic representativeness of the sample.
- The trip attributes collected.
- Implications of the sample size/rate for travel behaviour analysis and modelling.

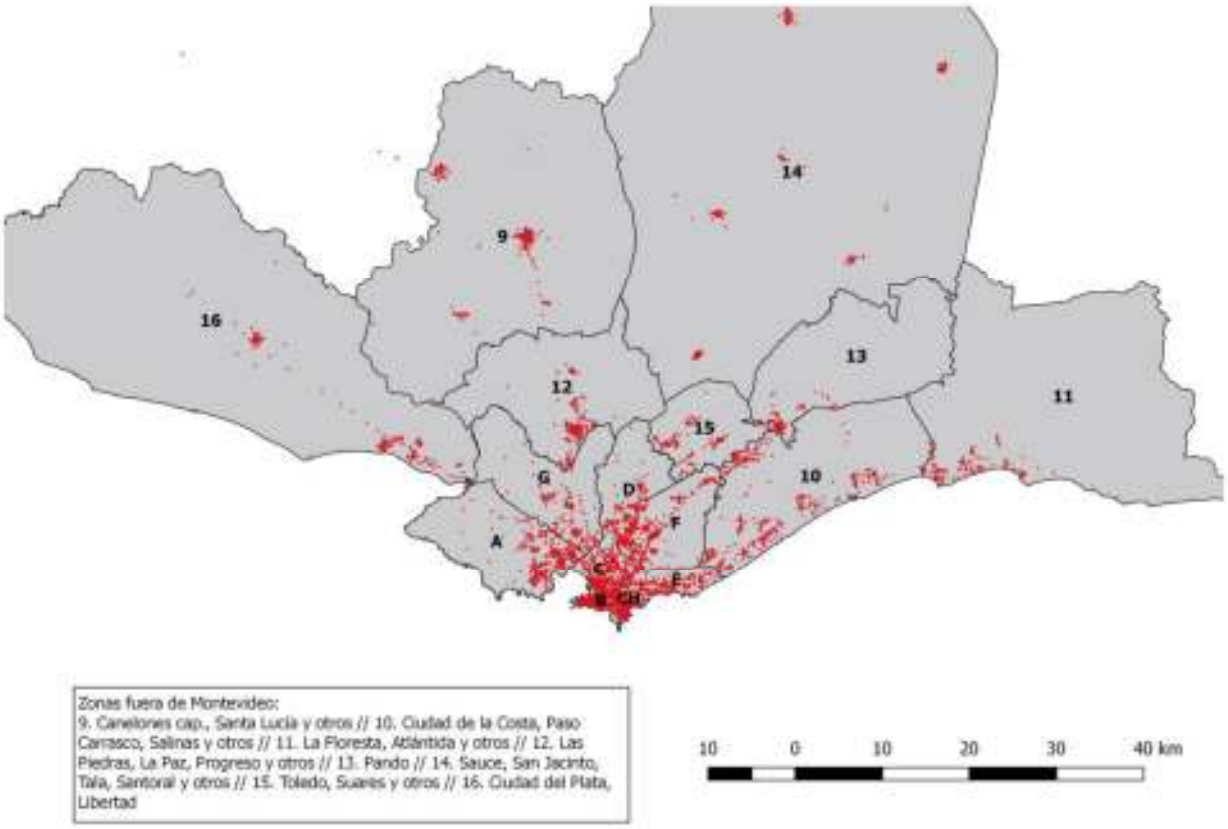
Each of these issues are briefly discussed in the following sub-sections.

2.4.1 Traffic Zone Definition

Although not a survey design question p*er se*, the definition of a traffic zone system for an urban region is an important consideration for travel behaviour analysis and modelling. It is universal practice to divide an urban region into a set of mutually exclusive and collectively exhaustive traffic zones. Population, employment, trip origins and destinations, and other spatial attributes are accumulated by traffic zone, which becomes the basic spatial unit of analysis for most purposes. Criteria for traffic zone definition include: maintaining approximately equal sized population in each zone; homogeneity of land use; respecting natural barriers (rivers, major highways and railway lines, etc.) and political boundaries, etc. (Meyer and Miller, 2001). All else being equal, smaller traffic zones are preferred for modelling transit usage, so as to represent walking access/egress to/from transit services with reasonable accuracy, but small zones imply a larger number of zones required to cover the urban region, with associated increases in data requirements and storage and modelling complexity and computational intensity. Generally, small zones are defined in the dense central city, with zone size gradually growing as one moves towards the periphery of the region, with associated decreases in population density.

The MHMS zone system used to code trip origins, destinations and origin-destination (O-D) trip flows is shown in Figure 2.2. It is quite an aggregate zone system, consisting of just 16 zones for the entire study region, 8 zones for Montevideo, 7 zones for Canelones and 1 zone for San

Jose. While consistent with the relatively small sample size (discussed further below), and useful for overall summary purposes and some descriptive analysis purposes, this is too coarse a zone system to be used in detailed travel demand modelling (discussed further in Chapter 3).



Zona goegráfica	Municipio/Localidades	Departamento
1	Municipio A	Montevideo
2	Municipio B	Montevideo
3	Municipio C	Montevideo
4	Municipio CH	Montevideo
5	Municipio D	Montevideo
6	Municipio E	Montevideo
7	Municipio F	Montevideo
8	Municipio G	Montevideo
9	Canelones Capital, Santa Lucía y otras	Canelones
10	Ciudad de la Costa, Paso Carrasco, Salinas Grandes y otras	Canelones
11	La Floresta, Atlántida y otras	Canelones
12	Las Piedras, La Paz, Progreso y otras	Canelones
13	Pando	Canelones
14	Sauce, San Jacinto, Tala, Santoral y otras	Canelones
15	Toledo, Suarez y otras	Canelones
16	Ciudad del Plata, Libertad	San José

Figure 2.2: Montevideo Traffic Zone System

This concern is illustrated in Table 25 in Appendix A of the *Principales resultados* report, in which over 2.466 million of the 4.154 million total observed trips are intrazonal trips; i.e., their origins and destinations are in the same zone. Travel demand models work best when most trips are interzonal in nature (have different origin and destination zones), since modelling intrazonal

travel times and mode choices is difficult using conventional network modelling software. Modelling transit and active transportation (walk and bicycle) trips is particularly difficult when overly large traffic zones are used.

2.4.2 Spatial Distribution of Respondents.

It is important that a general travel survey such as MHMS have good spatial coverage of the urban region, so that as complete and representative range of travel conditions (suburban, urban; auto-oriented, transit-oriented; etc.) are included in the dataset. Figure 2.3 plots the distribution of the households who were interviewed in MHMS, which shows a good distribution of surveyed households across the region. Returning to Table 25 in the *Principales resultados* report we similarly see a good distribution of O-D trips across the region, which is very good for travel demand modelling purposes.

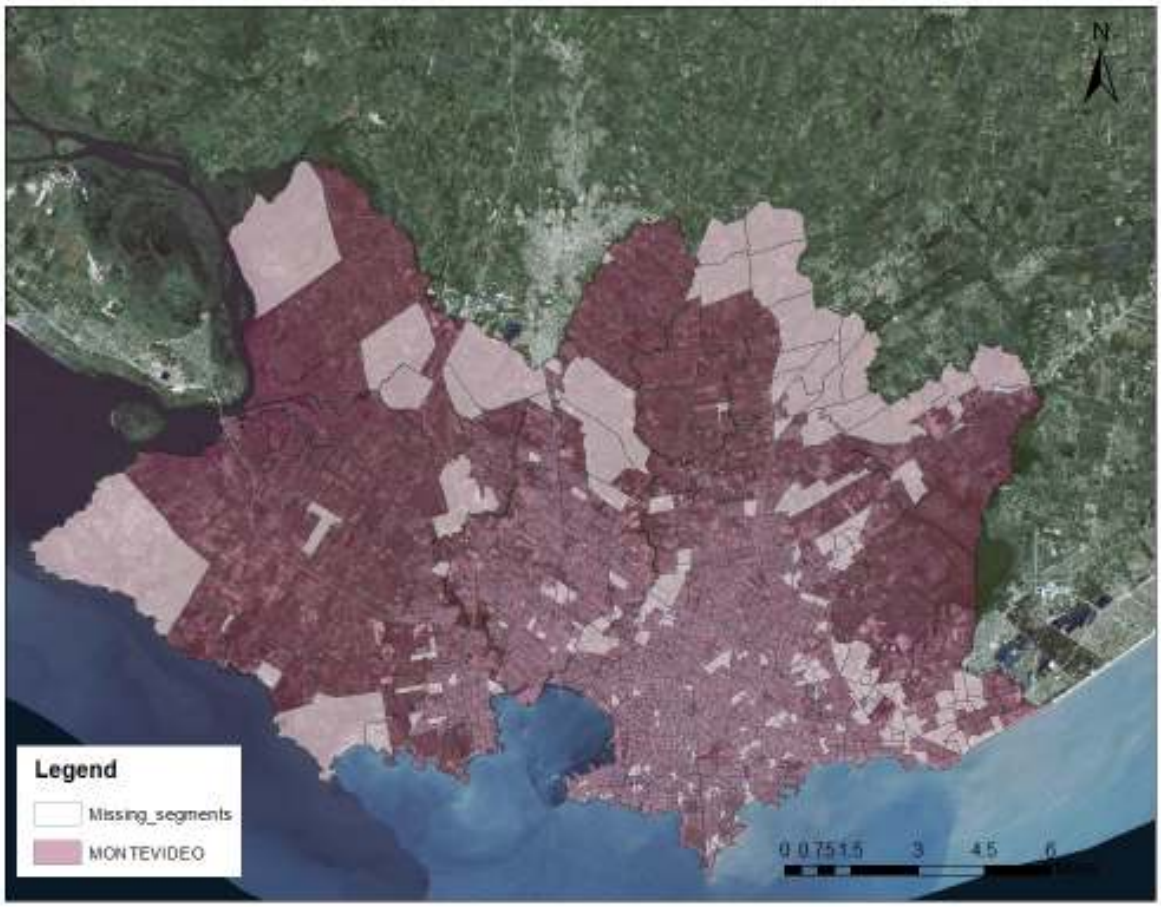


Figure 2.3: Spatial Distribution of MHMS Households

2.4.3 Socio-Economic Representativeness

Two key concerns in any survey are that:

- Important socio-economic attributes of persons and households that are critical to explaining travel behaviour are collected.

- The persons and households sampled are as representative as possible of the overall trip-making population. This is important so that unbiased estimates of population-level travel statistics can be constructed, as well as to provide as good a base as possible for possible modelling applications (discussed further in Chapter 3).

The socio-economic attributes collected in MHMS are shown in Table 2.1. These represent a typical set of attributes for such a survey and provide a solid basis for constructing travel demand models. The inclusion of income, education attributes and worker employment attributes are particularly helpful.

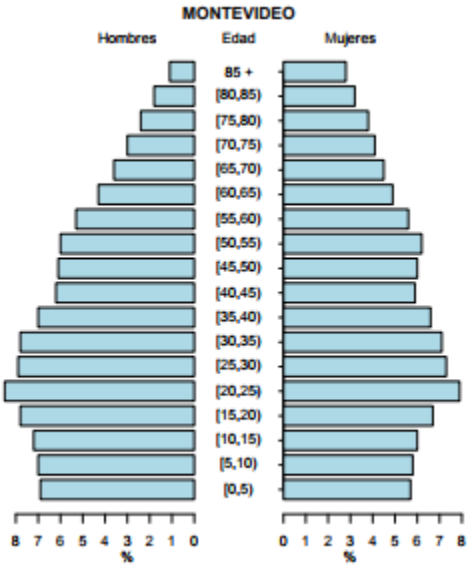
Household Socio-Economic attributes collected	Categories
Dwelling type	5
People living in household	-
People under 18	-
Working individuals	-
Average monthly income	8
Access to internet	3
Access to computer	3
Number of vehicles	-

Person Socio-Economic attributes collected	Categories
Age	
Gender	2
Relationship to other individuals in the household	-
Vehicle owner	-
Working individual (Yes or No)	2
Occupation	7
Attendance to education institution	2
Highest level of education achieved	-
Current education level (if applicable)	-
Working hours per week	-
Work location type	6
Work location start (if different than work location type)	-
Driver's license	2
Frequency of car use	-
Number of trips made during day of survey	-
Reason for not making trips (if applicable)	-

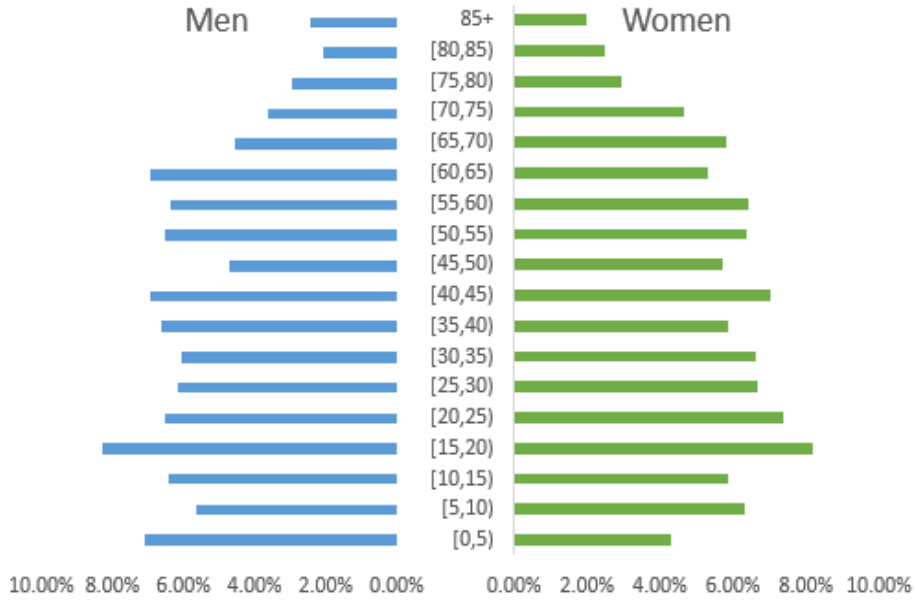
Table 2.1: Person & Household Socio-Economic Attributes Collected in MHMS.
(Source: Collated by the authors.)

In order to assess the representativeness of the sample obtained, it is commonplace to compare the distribution of sample socio-economic attributes to the same attributes for the population as a whole, where the later are typically drawn from a recent census of the population. In the case of Montevideo, the last national census was in 2011. Given the relative low rate of population

change in Montevideo between 2011 and 2016, it is hoped that the 2011 census data remain relatively representative of the 2016 Montevideo population, and so provide an adequate basis for comparison to the MHMS survey results.



(a) ***Montevideo age-gender distribution as recorded in the 2011 Census. Source:*** http://www.montevideo.gub.uy/sites/default/files/informe_censos_2011_mdeo_y_area_metro.pdf



(b) ***Montevideo age-gender distribution as recorded in the 2016 MHMS. Source: Compiled by the authors from MHMS.***

Figure 2.4: Comparison of 2011 Census & 2016 MHMS Age-Gender Distributions (Montevideo only).

Figure 2.4 compares the age-gender distribution for respondents in the MHMS sample with comparable national census data. While a relatively small sample such as MHMS cannot be expected to precisely replicate the census distribution, the overall correspondence is generally quite good. In particular, there is no evidence of excessive over/under sampling in any age category. Age is an important variable in explaining trip-making behaviour, so this result is an important one for the ability of MHMS data to support travel demand modelling efforts.

Income is another important explanatory variable. Unfortunately the study team was not able to find appropriate census data to compare to the MHMS sample income distribution. Based on Table 4 in the *Principales resultados* report (summarized here in Table 2.2), it may be that high income households have been somewhat oversampled relative to low income households. This is a plausible outcome, since, despite efforts to randomize sampling across spatial and social dimensions, it may well be that higher income households are somewhat easier to recruit than lower income households. This result is something that would need to be accounted for in a travel demand modelling effort, but is not a serious obstacle to building such a model.

	Households	
Income Category	**Number**	**Percent**
A+, A-	236969	36.5%
M+, M, M-	305420	47.0%
B+, B-	106855	16.5%
Total	649244	

Table 2.2: Summary of Households by Income Category in MHMS.

2.4.4 Trip Characteristics Collected

Similarly, the survey must collect as complete and accurate a set of characteristics of each trip made by each respondent as possible. Table 2.3 lists the set of attributes collected in MHMS for each trip. As with the socio-economic attributes discussed above, these represent a typical set of attributes for such a survey and provide a solid basis for constructing travel demand models. Indeed, the set of attributes collected is exemplary relative to many surveys and should be able to support quite detailed analyses.

The representativeness of the sampled trips cannot be directly ascertained, since comparable, independent, detailed data concerning trip-making in the region are not available. Comparison of aggregate MHMS trip statistics with 2011 survey results in the *Principales resultados* report suggests that the MHMS results are quite plausible, as do the summary statistics in the report concerning trip mode, purpose and start time distributions. Thus, there is no reason to believe that the MHMS trip data are not a suitable basis for travel demand modelling.

2.4.5 Sample Size Implications

A 0.33% sample is small compared to may surveys, which often are in the 1% range. The small sample size obviously reflects the budget and other resources available to conduct the survey. Home-interview surveys are expensive to undertake given their labour-intensive nature. On the other hand, when well executed (as is the case for the MHMS), they return a wealth of high quality data per respondent.

Trip characteristics collected	Options
Trip purpose	16
Start and end time	-
Total duration of trip from start to end (minutes)	-
Mode of transport	15
Address or intersection close to destination of trip	-
Frequency of trip (per week or month)	6
Work location (primary job)	-

Trip leg characteristics collected	Options
Mode of transport	15
Walking distance from origin/destination of trip to access a car/bus (if applicable)	
For car users	
Parking location	6
Fee for parking	4
Fee paid for parking (hourly, daily, monthly, …)	5
Fee paid for toll	
Passengers in car	
For bicycle users	
Bicycle parking location	7
For taxi users	
Service fee	
Person that paid for the service	4
Passengers in taxi	
For bus users	
Bus line	
Destination of bus line	
Waiting time at bus top	
For rail users	
Rail line	

Table 2.3: Trip Attributes Collected in MHMS (trips and legs of trips). *(Source: Collated by the authors.)*

The major limitation of the small sample size is that origin-destination (O-D) trip matrices can not be constructed at the traffic zone level with reasonable statistical precision (as briefly discussed above). As illustrated in the MHMS project report, O-D matrices need to be

constructed at higher levels of spatial aggregation. This is still useful for many planning purposes where a general understanding of travel flows is sufficient.

Similarly, the small sample size means that detailed total flows by transit line or road segment cannot be reliably estimated due to the relative "thinness" of the O-D data. This implies the need for alternative data sources for detailed analysis and modelling of transit and roadway route choices, line and link volumes, etc. (discussed further in the next chapter).

The detailed MHMS records, however, do provide very useful information for understanding overall trip-making in terms of trip purposes, mode choices, trip start times and out-of-home activity durations (defined by the time between trips). These data are useful for a wide variety of planning purposes. They are also very useful for constructing formal models of activity/trip generation, scheduling and location choice, as well as trip mode choice. These applications are discussed further in the next chapter.

2.5 IMPLICATIONS FOR HOME-INTERVIEW SURVEYS IN LATIN AMERICA

Home-interview surveys are likely to continue to have a future in Latin American cities for some time to come, for at least two reasons. First, as indicated in the discussion above, a well-designed and well-executed survey can return a wealth of high-quality data that is useful for many transportation planning purposes, including building travel demand models. Second, it may be the case in many cities that difficulties in the widespread use of other "advanced technology" data collection methods (smartphone apps, web-based surveys, etc.) in at least parts of the city may be difficult to overcome for some time to come. Report 1 in this project's report series discusses this issue at greater length. It is also important to note that these data collection methods are not without their own issues as well (no one method is ever a perfect solution for every application).

At the same time, these surveys are expensive and time-consuming to execute. As a result, they usually have relatively small sample sizes, which limit their applications in some cases. Also because of their logistical challenges, they are only undertaken intermittently, and they only provide cross-section snap-shots.

So, they should most likely be used in combination with other sources of information about travel that can provide enhanced spatial detail, as well as provide a more longitudinal/time-series view of trip-making over time. In particular, both transit smartcard and cellphone cellular data records (CDR) are available in many Latin American urban regions (and, notably, in Montevideo) and these should be explored in detail, especially in terms of being used in combination with home-interview surveys such as MHMS.

Data fusion by design; core-satellite design.

This is issue is briefly discussed further in Chapter 3 and is also explored in more detail in other reports in this project's report series.

2.6 DISCUSSION SUMMARY

The MHMS is found to be a well designed and administered home interview survey that has generated a high-quality dataset that is suitable for a range of useful transportation planning and modelling applications. Its major limitation is its relatively small sample size, which limits the ability to expand the sample to total population levels involving the need for a comprehensive representation at a fine level of spatial disaggregation (traffic-zone-level O-D matrices and transit lines / roadway segments). As discussed in the next chapter, however, the MHMS data represent an important dataset to support the construction of a detailed activity-based model of travel within the Montevideo region, particularly when it is combined with other travel-related datasets that are available within the region.

CHAPTER 3
TRAVEL DEMAND MODELLING USING MHMS DATA

3.1 INTRODUCTION

While travel survey data such as the MHMS data have many uses in transportation planning, a major application is developing travel demand forecasting models for the urban region that can be used in a wide variety of planning, policy analysis and decision-support contexts. Such models allow planners to ask "what-if" questions that lie at the heart of many planning exercises: "What if we build a new BRT line?" "What if we change our transit fare policies?" "What if we implement a network of bicycle lanes? Etc.

A well-designed and well-validated travel demand model provides a "virtual laboratory" in which such questions can be investigated to explore the likely impacts, benefits and costs of such policies relative the "do-nothing" base case, as well as competing alternatives for investment and implementation. In a world of scarce resources, competing interests and high risks if policies fail, being able to experiment with alternative strategies within the model's virtual laboratory reduces these risks and increases the likelihood of identifying "best paths" into the future for enhanced, more equitable and sustainable mobility within our urban regions. They may also help planners navigate inevitably political discourses by providing strong, credible evidence concerning better, versus less attractive, alternatives.

The availability of the MHMS data places Montevideo in a strong position to develop new, more policy-sensitive models of travel behaviour in the region, as discussed in Section 3.2. As noted, in Chapter 2, MHMS, like any dataset, is not without its weaknesses and can be very usefully supplemented by other datasets available within Montevideo. This issue is discussed in Section 3.3.

3.2 BUILDING ACTIVITY/TRAVEL MODELS WITH MHMS DATA

The activity-based, agent-based microsimulation model of travel demand, GTAModel V4.0 (Vaughan and Miller, 2015), which is the operational model for the City of Toronto, Canada, has recently been applied to Asunción, Paraguay as the SATA model system (2017a,b). If such a travel demand forecasting model system were to be applied to the Montevideo urban region it require extensive information concerning current travel behaviour in the region for its calibration and validation. The MHMS data would play a critical role in such an exercise.

Figure 3.1 presents an overview of the SATA model system. MHMS data would be useful in the development of the following components:

- *Population and job synthesis:* Population and employment totals for each traffic zone in the forecast year need to be disaggregated into individual persons with specific socio-economic attributes (age, employment status, etc.), households (income, auto ownership level, number of persons, etc.) and jobs (occupation type, etc.). The individual MHMS

household and person records would play a key role in achieving a statistically representative synthesized set of person, household and job records.

- *PORPOW and PORPOS:* Each worker and student must be assigned a place of work or school, respectively. MHMS observed work and school locations given respondents' places of residence can be used to develop these models.

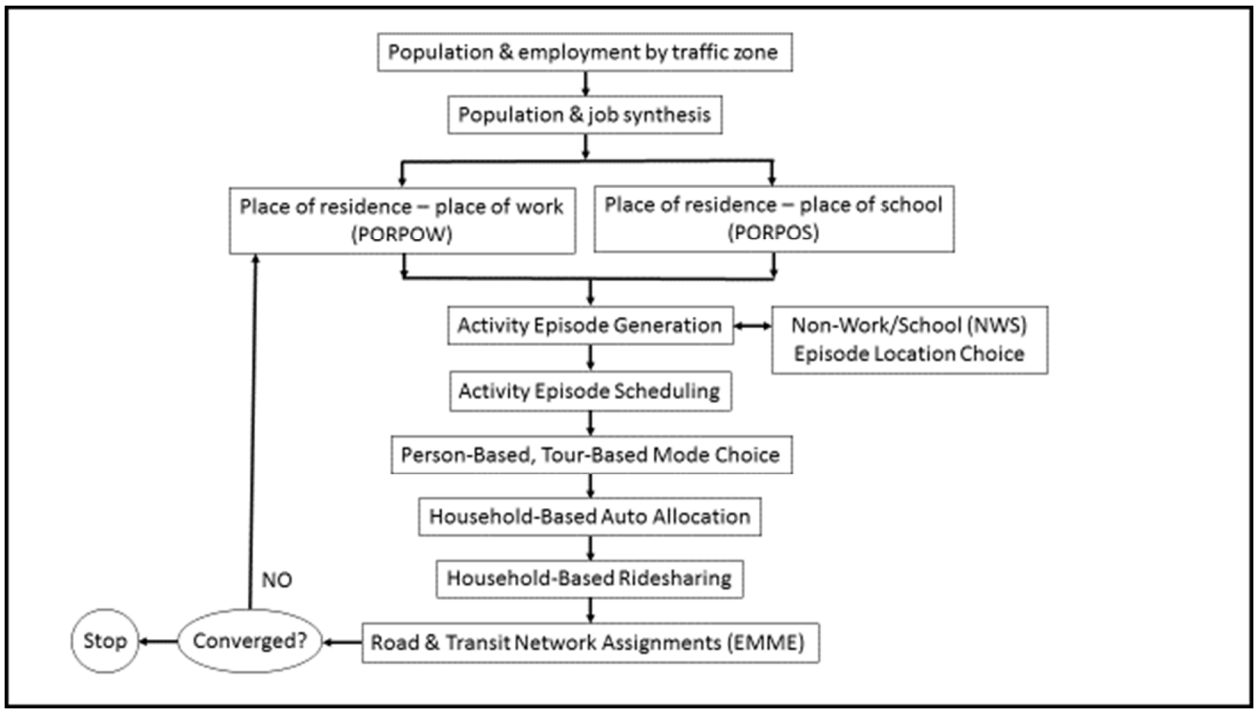


Figure 3.1: SATA Model System

- *Activity episode generation:* SATA generates every out-of-home activity episode for every person in every household in the region. Each episode has type (work, school, shopping, etc.), start time and duration. The episode generation model would be based on MHMS distributions of activity episodes and their attributes.
- *NWS episode location choice:* Each NWS episode generated needs to have its location determined from the set of feasible destinations for the given episode activity type (shopping, etc.). A random-utility-based location choice model would be built using MHMS data.
- *Mode choice, auto allocation and household ridesharing:* Once all activity episodes for each person within a household have been generated and scheduled for the day, travel mode choices for each trip made by each person are determined. This is modelled as a three-stop process:
    1. Each person independently selects his/her best/preferred mode of travel for each person using a random-utility-based mode choice model.
    2. If two or more household members want to use the same car at the same time (i.e., during overlapping time periods) then the household allocates the car to the driver who "needs it the most" and the other driver must then use his/her second-best mode for the trips in question. This allocation is chosen so as to maximize overall household utility, subject to mode choice feasibility constraints.

3. Once household drivers have been allocated to household vehicles, opportunities for these drivers to offer rides to other household trip-makers (within household ridesharing). Rideshare trips are chosen when they improve household utility, subject to constraints on the feasibility of the rideshare trip.

These three models would be jointly estimated (so as to maximize the ability of the model to correctly predict the overall mode choices of the household members) using MHMS data.

In all cases, the disaggregate (individual) MHMS household, person and trip records would be required to develop these disaggregate, agent-based models, not just the aggregate O-D trip matrices. The availability of the very recent MHMS survey data is what makes the development of an operational SATA-type model possible for the Montevideo region. Such a disaggregate dataset, unfortunately, was not available for Asunción, which severely limited the ability to properly calibrate the model to local conditions.

3.3 COMBINING MHMS DATA WITH OTHER DATASETS

As discussed in Chapter 2, the major limitation of the MHMS dataset is the relatively small sample size, which limits the ability to construct statistically valid O-D matrices at the fine-grained traffic zone level. While, as discussed in the previous section, MHMS data can be used to estimate most components of an activity-based model, full calibration and implementation of an operational model system ideally should use additional, larger-sample data concerning both O-D flows on a traffic zone–to–traffic zone level, as well as road and transit line count data.

Montevideo is fortunate in that it has two such additional sources of data that might be used for this purpose. The first is transit smartcard data which provides very comprehensive time-series information concerning transit usage within the system. It is possible to manipulate the raw data (which consists of time-stamped "tap-ons" of cards at the time of boarding a particular transit vehicle) to generate:

- Transit boarding and ridership counts by transit line and time of day.
- Transit trip O-D matrices by time day.
- Inferences concerning transit trip-maker home and work locations.

The major limitation of these data for travel demand modelling purposes is the lack of information concerning the transit riders' socio-economic characteristics (age, gender, etc.). These data, however, can be combined with MHMS data to provide a much more comprehensive representation of transit-based trip-making, both spatially and temporally within the Montevideo region, to support the development of a well-calibrated model of transit ridership within an overall regional travel demand forecasting system for the region. Montevideo smartcard data and methods for their analysis and use for transportation planning purposes are being extensively investigated within this project. For further details see Parada and Miller (2017, 2018).

The second dataset that has great potential for supporting travel demand analysis and modelling is cellphone-based cellular data records (CDR), which provide time-space traces of cellphone movements (and hence the movement of the cellphone users) through the urban region. Again with manipulation of the raw data, O-D trips by time of day can be imputed, possibly by mode

(depending on the time-space precision of the CDR records), as well as and trip-maker home and work locations (providing multiple days of observations for the same cellphone owners are available for analysis[3]). As with smartcard data, no information concerning the trip-maker is available in this dataset, and so combining these data with detailed MHMS records can greatly enhance the usefulness of the cellphone data for travel demand modelling purposes. Indeed, the ideal objective would be to combine MHMS, smartcard and cellphone data together in a massive *data fusion* exercise to create a comprehensive dataset for modelling purposes (Miller and Habib, 2017). A one-day sample of Antel CDR records has been analysed within this project, leading to recommendations for how to use a much larger multi-day/week sample for modelling purposes (Faghih-Imani and Miller, 2017).

[3] The same comment holds for smartcard data: multiple days of observations of the same cardholders is essential to make good use of the data for modelling purposes.

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APPENDIX I
SURVEY QUESTIONAIRE

ENCUESTA DE MOVILIDAD

ÁREA METROPOLITANA DE MONTEVIDEO

FORMULARIO N°

A - IDENTIFICACIÓN DE LA VIVIENDA

UBICACIÓN GEOGRÁFICA

Departamento: _____

Localidad: _____

Dirección: _____

Teléfono: _____

Persona de contacto: _____

RELEVAMIENTO

Encuestador: _____

Supervisor: _____

IDENTIFICADOR DEL HOGAR

B - CONTROL DE RELEVAMIENTO

VISITA	FECHA			H I		H F		OBSERVACIONES
1								
2								
3								
4								
5								
6								

¿Se relevó la vivienda?

Sí, a todos los integrantes del hogar ☐ 1

Sí, parcialmente ☐ 2

No ☐ 3

NO se relevó, causas

Ausencia temporal ☐ 1

Vivienda desocupada ☐ 2

Vivienda destruída o abandonada ☐ 3

Dirección no identificada ☐ 4

Rechazo total ☐ 5

Otras Causas ☐ 6

Descripción

C - VIVIENDA

1 Tipo de vivienda

Casa ☐ 1

Apartamento o casa en complejo habitacional ☐ 2

Apartamento en edificio de altura ☐ 3

Apartamento en edificio de una planta ☐ 4

Local no construido para vivienda ☐ 5

2 Con respecto a esta vivienda, (el hogar es propietario)

(incluye que la esté pagando o ya la haya pagado)

Sí ☐ 1

No ☐ 2

3 ¿Cuál es el material predominante de los techos de la vivienda?

De chapa u otro material ☐ 1

De material (planchada u hormigón) ☐ 2

Materiales de desecho/otro ☐ 3

4 ¿Esta vivienda tiene baño?

Sí ☐ 1

No ☐ 2

5 ¿Con cuantos baños cuenta esta vivienda?

Anote la cantidad ☐

D - HOGAR

1 ¿ Este hogar cuenta con:

	Sí	No	
Aire acondicionado?	☐	☐	1
Computadora (no celular)?	☐	☐	2
Acceso a internet?	☐	☐	3
Lavarropa?	☐	☐	4
Bicicleta en condiciones de ser utilizada?	☐	☐	5
Anote la cantidad			☐☐
Ciclomotor o motocicleta (incluye "mosquito" y cuatriciclo)?	☐	☐	6
Anote la cantidad			☐☐
Autos o camionetas?	☐	☐	7
Anote la cantidad			☐☐

Si no cuenta con ciclomotor o motocicleta ni auto o camioneta pasa a preg. 5

2 Características de los vehículos motorizados del hogar

	Tipo	Propiedad	Marca	Modelo	Año
Vehiculo 1					
Vehiculo 2					
Vehiculo 3					
Vehiculo 4					
Vehiculo 5					
Vehiculo 6					
Vehiculo 7					
Vehiculo 8					
Vehiculo 9					
Vehiculo 10					

TIPO: 1. Auto o camioneta 2. Moto (incluye mosquito y cuatriciclo) 3.Otro vehículo
PROPIEDAD: 1. Propio, uso particular 2. Propio, de trabajo 3.Empresa - Gobierno

3 ¿Tiene un lugar para guardar autos o camionetas en la vivienda? (Garage o lugar abierto)

Sí ☐ 1
No ☐ 2 Pase a preg. 5

4 ¿Cuántos autos o camionetas puede guardar?

Anote la cantidad ☐☐

5 ¿Cuántas personas viven habitualmente en este hogar? (sin considerar al servicio doméstico)

Anote la cantidad ☐☐

6 ¿Cuántos niños menores de 18 años, incluyendo recién nacidos, viven en este hogar?

Anote la cantidad ☐☐

7 ¿Este hogar cuenta con servicio doméstico?

No ☐ 1
Sí, por día o por hora ☐ 2
Sí, con cama ☐ 3

8 Relación de Parentesco con el Jefe del Hogar

01 Jefe del hogar
02 Esposo/a o compañero/a
03 Hijo/a de ambos
04 Hijo/a solo del jefe
05 Hijo/a solo del esposo/a o compañero/a
06 Yerno / nuera
07 Padre / Madre
08 Suegro/a
09 Hermano/a
10 Cuñado/a
11 Nieto/a
12 Otro pariente
13 Otro no pariente
14 Servicio doméstico o familiares del mismo

(*) años cumplidos

Identificador de la peersona	*Nombre*	*Edad(*)*	*Sexo*		*Parentezco con el jefe de hogar*	*Observaciones*
			M	*F*		
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

9 N° de persona que responde por datos de Vivienda y Hogar

Anote número ..... |_|_|

10 ¿Cuántas personas perciben ingresos en el hogar? (por cualquier concepto, incluyendo trabajo, monetario o en especie, propiedad o por transferencia)

Anote la cantidad ..... |_|_|

11 ¿Cuál es el ingreso mensual aproximado del hogar? (considerando todo tipo de fuentes como salarios, rentas, planes sociales, etc.) MOSTRAR TARJETA

Hata 20.000 ..... ☐ 1
Entre 20.001 y 30.000 ..... ☐ 2
Entre 30.001 y 40.000 ..... ☐ 3
Entre 40.001 y 50.000 ..... ☐ 4
Entre 50.001 y 60.000 ..... ☐ 5
Entre 60.001 y 80.000 ..... ☐ 6
Entre 80.001 y 100.000 ..... ☐ 7
Más de 100.000 ..... ☐ 8

E - PERSONAS

1 Nº DE PERSONA	2 NOMBRE DE LA PERSONA	NÚMERO DE TELEFONO

Para personas de hasta 17 años constesta un referente mayor o lo hace acompañado por uno.

3 ¿Asiste o asistió a un establecimiento de enseñanza prescolar, primaria, secundaria, superior o técnica?
(Enseñanza formal)

- Sí, asiste actualmente ☐ 1
- Sí, asistió ☐ 2
- No ☐ 3 Pase a preg. 7

4 ¿A qué nivel está asistiendo o cuál fue el nivel más alto alcanzado?

- 1 Prescolar ☐
- 2 Primaria ☐
- 3 Secundaria ☐
- 4 Enseñanza Técnica (UTU, similar) ☐
  - 4.1 para este curso se exigía
    - 1 Enseñanza Secundaria completa ☐
    - 2 Enseñanza Secundaria 1er ciclo ☐
    - 3 Enseñanza Primaria completa ☐
    - 4 Ninguna ☐
- 5 Magisterio, profesorado, otros terciarios no universitarios ☐
- 6 Universitario ☐
- 7 Estudios de posgrado ☐

5 ¿Cuál fue el año más alto aprobado?

Anote año ☐☐☐☐

6 ¿Finalizó el nivel más alto alcanzado?

- Sí ☐ 1
- No ☐ 2

7 ¿En qué servicio o institución atiende su salud más frecuentemente?

- Policial / Militar ☐ 1
- ASSE u otra pública ☐ 2
- Mutualista ☐ 3
- Seguro privado ☐ 4
- Otra ☐ 5

_____
especificar

PERSONAS DE 14 O MÁS AÑOS

8 Durante la semana pasada ¿trabajó por lo menos una hora sin considerar los quehaceres de su hogar?

- Sí ☐ 1 Pase a preg. 11
- No ☐ 2

9 ¿Tiene un trabajo al qué volverá? En caso de que no haya trabajado

- No ☐ 1
- Sí (licencia, enfermedad, etc) ☐ 2 Pase a preg. 11

10 ¿Cuál fue su actividad principal en la última semana?
En caso de que no haya trabajado

- Está buscando trabajo ☐ 1
- Estudiante ☐ 2
- Realiza quehaceres del hogar ☐ 3
- Jubilado o pensionista ☐ 4
- Ninguna ☐ 5
- Rentistas ☐ 6
- Otra (Cuál) ☐ 7

_____
especificar

SOLO PARA QUIENES TRABAJAN O TIENEN UN TRABAJO AL QUE VOLVERÁN

11 ¿Cuántas horas ha trabajado en la última semana (o la última que trabajó si vuelve a uno) *en todos sus trabajos?*

Anote cantidad de horas ☐☐☐

12 ¿Generalmente, dónde desarrolla su trabajo?

- En su vivienda ☐ 1 Pase a preg. 15
- En lugar fijo no vivienda ☐ 2
- (*1)En la calle ☐ 3 Pase a preg. 14
- En dos lugares distintos ☐ 4
- (*2)En múltiples lugares (más de dos) ☐ 5 Pase a preg. 14
- Otro ☐ 6

_____
especificar

*1 Ej.: Choferes, repartidores, vendedores, cadetes, transportistas en general

*2 Ej.: Instaladores, reparadores, trabajadores domésticos con varias casas

13 ¿Cuál es la localización de su trabajo principal? Si trabaja en dos lugares distintos, indique la localización del trabajo principal

Calle

Esquina

Otro

Departamento

Localidad / Barrio

14 Previo al desarrollo de las tareas, ¿debe presentarse obligatoriamente en alguna dirección fija? Si se trata de alguien que trabaja en la calle o en múltiples lugares

- Si (indique dirección) ☐ 1
- No ☐ 2

Calle

Esquina

Otro

Departamento

Localidad / Barrio

PERSONAS DE 18 O MÁS AÑOS

15 ¿Tiene Licencia de conducir?

- Sí ☐ 1
- Sí, pero está vencida ☐ 2
- No ☐ 3

PERSONAS DE 18 O MÁS AÑOS

SOLO HOGARES CON ALGÚN VEHÍCULO MOTORIZADO EN EL HOGAR

16 Hablemos ahora del uso de algún vehículo del hogar... ***¿Podría ud. indicar la posibilidad de uso de vehículo cuando necesita desplazarse?*** **Utilice una escala del 1 al 5**, donde 1 indica que NUNCA puede usarlo y 5 que puede usarlo SIEMPRE que lo necesita MOSTRAR TARJETA

- Nunca ☐ 1
- Pocas veces ☐ 2
- Habitualmente ☐ 3
- Muchas veces ☐ 4
- Siempre ☐ 5

MOVILIDAD - PARA PERSONAS DE 4 O MÁS AÑOS

17 ¿Dónde estaba usted a las 4 de la mañana del día de ayer?

- Hogar ☐ 1Pase a preg. 19
- Lugar de trabajo ☐ 2
- Casa de amigos / familiares ☐ 3
- Lugar de recreación ☐ 4
- Hospital / centro médico ☐ 5
- Otro ☐ 6

18 Si no estaba en su hogar ¿puede decirnos la dirección exacta del lugar donde comenzó el día?

Calle

Esquina

Otro

Departamento

Localidad / Barrio

19 ¿Fue a algún lugar entre las 4 de la mañana del día de ayer y las 4 de la mañana del día de hoy dentro del Área Metropolitana de Montevideo?

- Sí ☐ 1 Pase a módulo Viajes
- No ☐ 2

20 ¿Por qué motivo no fue a ningún lugar? (respuesta espontánea)

- Incapacidad física ☐ 1
- Enfermedad transitoria ☐ 2
- Vacaciones, licencia o razones gremiales ☐ 3
- Tuvo que quedarse en el hogar esperando algo ☐ 4
- Tuvo que quedarse en el hogar cuidando familiar ☐ 5
- No estaba el auto disponible o estaba averiado ☐ 6
- Clima adverso ☐ 7
- Trabaja en casa ☐ 8
- Por huelga o paro del sistema de transporte ☐ 9
- Ninguna razón en particular ☐ 10
- Otro ☐ 11

especificar

A continuación le solicitamos la información completa sobre todos los viajes que hizo para realizar actividades por las que tuvo que ir de un lugar a otro (ir a trabajar, a la escuela, a comprar algo, volver al hogar, etc.). Cuente todos los viajes ya sea que sean caminando, en bicicleta, ómnibus, auto o cualquier otro medio.

F - VIAJES

1 N° DE PERSONA	2 FECHA DEL VIAJE	3 VIAJE
	/	DE

4 *¿Qué fue a hacer?*

- Regreso al hogar ☐ 1
- Trabajo ☐ 2
- Trámites de trabajo ☐ 3
- Trámites personales ☐ 4
- Estudios ☐ 5
- Compras (para el hogar) ☐ 6
- Compras (personal) ☐ 7
- Asistencia médica / dental ☐ 8
- Culto ☐ 9
- Ir a comer (p.e. pausa en trabajo) ☐ 10
- Dejar / recoger niños en el colegio ☐ 11
- Dejar / recoger a alguien ☐ 12
- Visitar a alguien ☐ 13
- Acompañar a alguien ☐ 14
- Entretenimiento y ocio ☐ 15
- Otro ☐ 16

especificar

5 *¿A qué hora inició el viaje?*

☐☐:☐☐

6 *¿A qué hora llegó a destino?*

☐☐:☐☐

7 *¿Cuál es la dirección o esquina donde fue a* (actividad)***?***

Calle

Esquina

Otro

Departamento

Localidad / Barrio

PARA TODOS LOS VIAJES

8 *¿Con qué frecuencia realiza este mismo viaje desde* (origen) ***a*** (destino)***?***

- 5 días/sem o más ☐ 1
- 3 o 4 días/semana ☐ 2
- 1 o 2 días/semana ☐ 3
- 2 o 3 días/mes ☐ 4
- 1 día al mes o menos ☐ 5

9 *¿Cómo fué?*

En viajes con caminata y otro modo: si es de 5 o más cuadras registrar como etapa 1 a pie. Si es menor a 5 cuadras registrar como cuadras antes del medio
Si parte del traslado lo realizó en más de un modo, registrarlo como etapa (exceptuando a pie si son menos de 5 cuadras) .

Caminata antes (cuadras)	*Bicicleta*	*Moto*	*Auto o camioneta*	*Transporte público colectivo*	*Bus escolar*	*Taxi o remise*	*Animal u otro*	*Caminata destino* (cuadras)

ETAPA

Automovil conductor	☐ bloques 0 y 1	Remis	☐ bloques 0 y 4	Animal	☐
Automovil pasajero	☐ bloques 0 y 1	Taxi	☐ bloques 0 y 4	Otro	☐
Moto conductor	☐ bloques 0 y 1	Ómnibus	☐ bloques 0 y 5		
Moto pasajero	☐ bloques 0 y 1	Ferrocarril	☐ bloques 0 y 5		
A pie	☐ bloque 2	Bus escolar	☐ bloques 0 y 5 (tarifa mensual)		
Bicicleta	☐ bloque 3	Bus de la empresa	☐ bloques 0 y 5 (tarifa si paga)		

Especificar

BLOQUE 0 - CAMINATA

1 *¿Cuántas cuadras caminó para llegar a la* (la parada o al vehículo) *?*

Anote la cantidad ☐☐

2 *¿Cuántas cuadras caminó desde* (la parada o al vehículo) *hasta* (ACTIVIDAD) *?*

Anote la cantidad ☐☐

BLOQUE 1 - AUTO O MOTOCICLETA

1 *¿Dónde estacionó?*

De la empresa	☐ 1
Vía pública libre	☐ 2
Vía pública tarifada	☐ 3
Playa de estacionamiento	☐ 4
Cochera residencial	☐ 5
Otro	☐ 6

especificar

2 *¿Pagó estacionamiento?*

Sí	☐ 1
No	☐ 2 Pase a preg. 5

3 *¿Qué tipo de Pago utilizó?*

Por hora	☐ 1
Por estadía	☐ 2
abono mensual	☐ 3

4 *¿Cuánto pagó por el estacionamiento?*

Anote el monto $☐☐☐☐

5 *¿Pagó peaje?*

Sí	☐ 1
No	☐ 2 Pase a preg. 7

6 *¿Cuánto pagó de peaje?*

Anote el monto $☐☐☐☐

7 *¿Cuántas personas viajaron con usted?*

Anote la cantidad ☐☐

BLOQUE 2 - A PIE

1 *Indique la cantidad de cuadras* Si es mayor o igual a 5 pase a bloque 6

Anote cantidad ☐☐

BLOQUE 3 - BICICLETA

1 *¿Dónde dejó la bicicleta una vez que llego a su destino?*

Dentro de edificio / casa	☐ 1
En la calle	☐ 2
En bicicletario público	☐ 3
En bicicletario privado	☐ 4
En estación movete	☐ 5
Otro	☐ 6

especificar

BLOQUE 4 - TAXI O REMISE

1 *¿Cuánto pagó?*

Anote el monto $☐☐☐☐

2 *¿Pagó usted?*

No	☐ 1
Sí	☐ 2
A medias	☐ 3

3 *¿Cuántas personas viajaron con usted?*

Anote la cantidad ☐☐

BLOQUE 5 - ÓMNIBUS / FERROCARRIL

SB1 - ÓMNIBUS

1 En este viaje en ÓMNIBUS, ¿qué línea utilizó?

Línea _____ Destino _____

2 ¿En qué parada se subió?

Calle _____

Esquina o punto de interés _____

Departamento _____

Localidad _____

3 ¿En qué parada se bajó?

Calle _____

Esquina o punto de interés _____

Departamento _____

Localidad _____

4 ¿Cuánto tiempo debió esperar en la parada?

Anote cantidad de minutos ____ Pase a SB3

SB2 - FERROCARRIL

5 En este viaje en FERROCARRIL, ¿qué línea o ramal utilizó?

Ramal _____

6 ¿En qué estación se subió?

Calle _____

Esquina o punto de interés _____

Departamento _____

Localidad _____

7 ¿En qué estación se bajó?

Calle _____

Esquina o punto de interés _____

Departamento _____

Localidad _____

8 ¿Cuánto tiempo debió esperar en la estación?

Anote cantidad de minutos ____ Pase a SB3

SB3 - ÓMNIBUS / FERROCARRIL

9 ¿Qué tipo de boleto compró?

Boleto común	1
Boleto céntrico	2
Boleto 1 hora	3
Boleto 2 horas	4
Boleto Diferencial	5
Jubilado A	6
Jubilado B	7
Estudiante A	8
Estudiante B	9
Estudiante Gratuito	10
Pase organismos o libres	11
Otros gratuitos	12
Prepago nominado	13
Metropolitano	14
Zonal	15
Comb. Canaria	16
Local Canelones	17
Boleto Zonal Suburbano	18
Abono Suburbano	19
Tren ida	20
Tren ida y vuelta	21
Abono Ferrocarril	22

SOLO PARA QUIENES UTILIZARON ABONO FERROCARRIL

10 Cantidad boletos del abono

Anote la cantidad ____

ÓMNIBUS EN GENERAL Y BUS ESCOLAR (MENSUAL)

11 ¿Cuánto pagó (o paga por mes si es bus escolar)*?*

Anote el monto $____

12 Cantidad boletos (sólo si utiliza abonos ómnibus)

Anote la cantidad ____

BLOQUE 6 - VIAJES O ETAPAS DE 5 O MÁS CUADRAS A PIE

1 En este (viaje o etapa del viaje) *usted caminó* (cantidad de cuadras), *¿cuál fue el motivo por el que caminó esta distancia?*

No quiere pagar la tarifa	1
No tiene dinero para pagar la tarifa	2
No tiene otro opción de transporte	3
Para evitar el trasbordo	4
Le gusta	5
Por salud	6
No le parece larga	7
Ningún motivo en particular	8
Otro	9

especificar _____

G - HÁBITOS Y OPINIÓN **1- N° DE PERSONA**

RESPUESTA ESPONTÁNEA

2 ¿Generalmente, cuál es el modo de transporte que utiliza con más frecuencia para sus viajes de más de 5 cuadras?

- Ómnibus ☐ 1
- Auto o camioneta ☐ 2
- Moto ☐ 3
- Caminata ☐ 4
- Bicicleta ☐ 5
- Taxi ☐ 6
- Otro ☐ 7

_____ especificar

3 ¿Ha utilizado el transporte público en el último mes?

LEER OPCIONES

- Urbano ☐ 1
- Suburbano ☐ 2
- No utilizó ☐ 3 Pase a preg. 10

4 ¿ Con qué frecuencia lo ha hecho?

	URB	SUB	
4 o más veces por semana	☐	☐	1
Entre 1 y 3 veces por semana	☐	☐	2
Entre 1 y 3 veces por mes	☐	☐	3

5 ¿ Cuál es la línea que utiliza con mayor frecuencia?

Línea Urbana

Línea Suburbana _____ Destino

6 Indique los 3 aspectos del Sistema de Transporte en Ómnibus que considera los más importantes

Numerar por orden de mayor importancia a menor	6.1	6.2	6.3
1 Frecuencia	☐	☐	☐
2 Puntualidad	☐	☐	☐
3 Tiempo de viaje	☐	☐	☐
4 Precio	☐	☐	☐
5 Atención del personal	☐	☐	☐
6 Limpieza	☐	☐	☐
7 Modo de conducción	☐	☐	☐
8 Comodidad en el viaje	☐	☐	☐
9 Distancia a la parada	☐	☐	☐
10 Facilidad para subir y bajar del bus	☐	☐	☐
11 Información disponible sobre el sistema	☐	☐	☐
12 Parada de buses (refugio e información)	☐	☐	☐
13 Otro	☐	☐	☐

_____ especificar

7 Califique cada uno de los siguientes aspectos del Sistema de Transporte de Ómnibus en Muy Bueno, Bueno, Ni Bueno - Ni Malo, Malo o Muy Malo (USAR TARJETA CON OPCIONES)

Solo para los que usaron urbano en pregunta 3 *Solo para los que usaron sub. en pregunta 3*

	Urbano					Suburbano				
	Muy malo	*Malo*	*Ni bueno ni malo*	*Bueno*	*Muy bueno*	*Muy malo*	*Malo*	*Ni bueno ni malo*	*Bueno*	*Muy bueno*
Frecuencia										
Puntualidad										
Tiempo de viaje										
Precio										
Precio en función de calidad recibida										
Atención del personal										
Limpieza										
Modo de conducción										
Comodidad en el viaje										
Facilidad para subir y bajar del bus										
Distancia de la parada										
Información disponible sobre el sistema										
Paradas de buses (refugio e información)										

8 ¿Cómo se informa sobre los HORARIOS de los ómnibus?

Numerar hasta 2 en orden de importancia	8.1	8.2
1 Web de la empresa	☐	☐
2 Teléfono de la empresa	☐	☐
3 Empleados empresas	☐	☐
4 Aplicaciones móviles	☐	☐
5 Personas desconocidas	☐	☐
6 Personas conocidas	☐	☐
7 Folleto	☐	☐
8 Webs gubernamentales	☐	☐
9 Cómo ir IM	☐	☐
10 Otro	☐	☐

especificar

9 ¿Cómo se informa sobre los RECORRIDOS de los ómnibus?

Numerar hasta 2 en orden de importancia	9.1	9.2
1 Web de la empresa	☐	☐
2 Teléfono de la empresa	☐	☐
3 Empleados empresas	☐	☐
4 Aplicaciones móviles	☐	☐
5 Personas desconocidas	☐	☐
6 Personas conocidas	☐	☐
7 Folleto	☐	☐
8 Webs gubernamentales	☐	☐
9 Cómo ir IM	☐	☐
10 Otro	☐	☐

especificar

10 ¿Qué factores serían determinantes para que Ud. utilizara el ómnibus en aquellos viajes donde usa otros medios de transporte? (Marque hasta tres opciones)

Pasar más frecuentemente	☐ 1
Ser más regulares	☐ 2
Pasar más cerca donde me sirve	☐ 3
Viajar sentado o más cómodo	☐ 4
Ser más barato	☐ 5
Menos tiempo de viaje	☐ 6
Pasar más seguido en la noche	☐ 7
Debería tener un servicio diferencial	☐ 8
Disponer del servicio que preciso	☐ 9

especificar

No lo utilizaría, no hay como el auto	☐ 10
No lo utilizaría, viajo muy poco	☐ 11
Otro	☐ 12

especificar

11 ¿Generalmente y dejando de lado salidas de paseo, con qué frecuencia utiliza la bicicleta para sus viajes?

4 o más veces por semana	☐ 1
Entre 1 y 3 veces por semana	☐ 2
Entre 1 y 3 veces por mes	☐ 3
No la uso nunca	☐ 4

12 ¿Por qué razones diría Ud. que no viaja más seguido en bicicleta?

Numerar hasta 2 en orden de importancia	12.1	12.2
1 No tiene	☐	☐
2 Tiene pero No disponible	☐	☐
3 Es inseguro el manejo	☐	☐
4 Inclemencias del clima	☐	☐
5 No tengo donde cambiar ropa	☐	☐
6 Distancia muy larga del viaje	☐	☐
7 No tiene lugar seguro donde dejarla	☐	☐
8 No tiene edad suficiente	☐	☐
9 Salud o Edad avanzada	☐	☐
10 Inseguridad en la calle	☐	☐
11 Me gusta solo para salir a pasear	☐	☐
12 Otro	☐	☐

especificar

HOJA DE OBSERVACIONES

IDENTIFICADOR DEL HOGAR

N° DE ENCUESTADOR

NOMBRE DEL ENCUESTADOR

Fecha

Fecha

Fecha

Fecha


Intendencia
deMontevideo
San José
comuna
canaria
Consorcio
Metropolitano
de Transporte
UNIVERSIDAD
DE LA REPÚBLICA
BANCO DE DESARROLLO
DE AMÉRICA LATINA
P N
U D

APPENDIX II
iCITY-SOUTH COMMENTS ON DRAFT QUESTIONNAIRE

De: Eric Miller [mailto:miller@ecf.utoronto.ca]
Enviado el: martes, 08 de diciembre de 2015 03:35 p.m.
Para: ESTUPIÑAN, NICOLAS
CC: 'Khandker Nurul Habib'; 'Judy Farvolden'; 'Renata Stabenow Jorge'
Asunto: Montevideo Survey Comments

Nicolas, our team has reviewed the Montevideo survey. Overall, we found it to be a well-designed survey. We have only a few comments and questions:

First a couple of questions / points of clarification:

1. We assume that each person in the household will be asked the personal questions on sheet 3 ("Hoja3_Personas") and the subsequent detailed trip questions (Hoja4, Hoja5 & Hoja6).
2. Will this be a telephone interview or a face-to-face home interview survey?

Comments/suggestions:

1. On the first sheet ("Hoja1") we would suggest asking each person:
    a. Whether they are a full-time worker, part-time worker, not employed.
    b. If employed, get the job's occupation/industry type (a short list of categories can presumably be put together to code this).
    c. Instead of asking actual birthdays (month & year) it probably is sufficient to simply ask for their current age. This would free up space on the page two columns for the employment questions.
2. On sheet two ("Hoja2") we would suggest adding a question asking for the household's annual income. Income categories would be fine to use (i.e., you don't need to ask for a precise income value).
3. On sheet three ("Hoja3") we would suggest also gathering information about work and school locations (addresses). This may seem a bit redundant since if the person goes to work or school you can get the information there, but if the person does not go to work/school the day of the survey you don't get this information. We made this mistake in our very first big travel survey back in 1986 and regretted not asking specifically for the work and school locations. We have done so in our surveys since, starting in 1991.
4. If the work location is asked on sheet three, then on sheet four ("Hoja4") the instruction can read: "If you started your day at home or work, please answer the following question. Of not, can you tell us the exact address of the place you started your day?".
5. On sheet 5 ("Hoja5"):
    a. For the activity categories "Dejar/recoger niños en el colegio", "Dejar/recoger a alguien" and "Acompañar a alguien" we have translated these as "Drop/pick up kids at school", "Drop/pick up someone" and "escort someone". Assuming that these translations are approximately what you intend, is there any danger that people may be confused between "drop/pick up" and "escort" functions? We are assuming that latter might involve things like taking a child to football practice (and staying with him/her) as

opposed to just dropping/picking someone up somewhere. Maybe it will all be clear to the respondents, but we just wanted to ask the question.

b. If a trip has more than two stages, will the third (and possibly subsequent) stages be recorded on another sheet? We assume so, but wanted to check that no trip stages would go unrecorded.

6. On sheet 6 ("Hoja6") in questions 10 and 11 will the distinction between "Urban" and "Suburban" be clear to the respondents?
7. Sheet 7, no comments.
8. Sorry, we weren't quite clear who will be completing the "Supervision" sheet, and , hence, what it's purpose it. So we do not have any comments on this sheet at this time.
9. Looking ahead to the follow-on research involving additional survey work, it would be useful at the end of the survey to ask if the household would be willing to be contacted sometime in the future for a follow-up survey. This creates the possibility of testing one or more of the new survey methods on people from this survey so that we can compare results across the different methods.

I hope that these comments are of some use to you. Again, our overall impression was of a very professionally designed, useful survey. Please let us know if we can be of further help with this.

-- eric

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