

# Mobility Mapping Innovations in Developing Countries: The Case of Metro Manila, Philippines

Marie Danielle GUILLEN <sup>a</sup>, Susan ZIELINSKI <sup>b</sup>

<sup>a</sup> *Institute of Sustainability, Ateneo de Manila University, Quezon City, 1108, Philippines*

<sup>a</sup> *E-mail: mguillen@ateneo.edu*

<sup>b</sup> *SMART (Sustainable Mobility & Accessibilty, Research & Transformation) University of Michigan, Ann Arbor MI, 48109-2150 USA*

<sup>b</sup> *E-mail:susanz@umich.edu*

**Abstract:** Using the Sustainable Mobility, Accessibility, Research and Transformation (SMART) implementation mapping approach introduced by the University of Michigan-SMART Initiative, the Ateneo School of Government-Inclusive Mobility Project was able to gather and inspire future catalysts towards inclusive mobility. This mobility mapping process utilizes the “moving people, moving goods and moving minds” paradigm practiced by SMART in collaboration with regions and communities around the world. It highlights the importance of gathering transportation leaders beyond the usual suspects (public, private, formal and informal) to apply collaborative integrated multi-modal mapping as a tool to identify the issues and opportunities for connected innovations and whole system implementation in the sector. Involving the different stakeholders while educating and gaining catalysts for inclusive mobility advocacy and project ownership is a novel feature of this work. It also offers insights into new inclusive planning approaches that can generate new resources and opportunities for sustainable mobility.

**Keywords:** mobility mapping, inclusive mobility, stakeholders

## 1. BACKGROUND

In many developing countries in Southeast Asia like the Philippines, reading maps is not part of the psyche. Perhaps this is because maps are not commonly seen in the metro region, and mobility mapping as a socially responsive activity of “connecting the dots” (in this case, the physical., informational, and social infrastructure) is seldom, if at all done.

Mapping is also an approach to achieving the overarching goal of inclusive mobility—“mobility of all, for all, by all”<sup>1</sup>. A recent study by Cass, et al (2005) noted that much of the related studies in social exclusion ignore its spatial or mobility related component. And another study by SEU (2003) found that even in developed countries like the United Kingdom, there is a growing awareness that transport problems can be a significant hindrance to social inclusion.

---

<sup>1</sup> A tagline conceptualized and adopted by the Inclusive Mobility Project of Innovations at the Base of the Pyramid Program of the Ateneo School of Government which is generously supported by the Rockefeller Foundation.

Utilizing the Sustainable Mobility, Accessibility, Research and Transformation (SMART) approach introduced by the University of Michigan-SMART Initiative, the Ateneo School of Government-Inclusive Mobility Project supported by the Rockefeller Foundation conducted a number of mobility mapping workshops in Metro Manila, Philippines.

The inclusive mobility mapping process considers the physical, organizational, and temporal resources (including financial) available to access the full participation within the society.

## **1.1 Mobility Mapping**

Mobility mapping is usually used as part of participatory study. It is a visual representation of people's movement within and outside their community. As a tool, it can identify issues and problems related to socially differentiated mobility and access to resources like land, water, health, education services, capital etc.). It can show the socially differentiated mobility within and outside a community and can indicate different levels of freedom, wealth, empowerment and rights. Mapping can show the economic, social, and political causes and impacts of socially differentiated mobility. In World Bank (2011), this approach is usually known as a complementary variation on community resource mapping and social mapping.

In this study, mobility mapping is being utilized to educate the community on the importance of mapping and at the same time use it as a tool to convene the different stakeholders that have interest in improving transportation. However, the focus is on the people, the way they use the transport-related infrastructure, modes and services, its connection and the related resources needed to make it work and to innovate additional new integrated solutions. It is about mobility.

## **1.2 The SMART Approach**

Recognizing that there is no single solution in addressing issues related to transportation, the SMART approach has generally evolved starting out with some simple goals that involved working together on connectivity, accessibility, livability and economic opportunities. Both the framework and the goals need to be customized to the community and its context. The main "rules of the game" are to focus on connecting the dots, not on introducing or improving any one particular solution. This has led to some improvement, enhancement and innovation, and built on what is already there, to fill gaps and generate exciting new products and/or services that emerge by looking at the "whole picture" together. Initial meetings (usually a few hours or a day long) will often begin with a check-in where each member will say who they are, and what they are proud or hopeful about related to transportation in their community or region. However, it should be noted that this approach is not an expression of denial or avoidance of many deep and complex problems of transportation, but rather it highlights immediately on solution building and action, recognizing the importance of each representative around the table in contributing to the development and implementation of the next or connected solutions. It builds on the current strengths and positive signs, starting the discussion on linking the positive aspects based on what is available, making the whole better than the sum of the parts and then challenges and gaps can be more positively addressed. The start of the meetings usually involves a presentation of the basic context and opportunity of the connected multi-modal network (or "grid") of urban transportation. It is a way of leveling off for the participants to be on a similar page when they reach the active solution development part of the meeting or the process.

## **2. RATIONALE AND ASSUMPTIONS**

Metro Manila is a rapidly urbanizing megacity and as such, one of its perennial issues is traffic. The common response is to build more roads. However, nowadays the paradigm is changing and more and more are realizing the importance of transportation system. The SMART approach looks at the “systems of systems” connecting modes, services, technologies and designs according to the best option for the purpose. Its focus is on the users. It is an initiative to ensure inclusive mobility (among other things).

The mapping and implementation workshop is designed to give participants the opportunity to collaboratively find ways in improving transportation including in a megacity in a developing country like Metro Manila, Philippines. When SMART does it in various regions around the world, it is usually done by a mix of transport leaders from the various sectors. However they have found it can also be very productive to involve citizens in the process.

In Manila the primary objectives were to (1) provide stakeholders the opportunity to work together in accelerating and advancing the implementation of sustainable, connected, inclusive transport and generating and sharing related information and policy initiatives; (2) reveal the existing and potential transport mobility grid including informal hubs and other uncharted transport system features; and 3) build on and further extend the shareable knowledge based of inclusive mobility-enhancing features commonly observed in cities of developing countries. The exercise is regarded as not simply a brainstorming activity but as a methodology for cross-sectoral learning and as a tool for accelerating implementation of enhanced, connected, optimized, and integrated mobility.

While the workshop is designed to invite stakeholders in the study area, it was initially assumed that there would be difficulty in having an equal gender representation of participants and that many of the participants are expected to come from the transport sector.

## **3. STUDY AREA AND METHODOLOGY**

Due to the complexity and diverse transportation modes often observed in cities of most developing nations, the need to catalyze and organize efforts to support mobility-related initiatives as well as facilitate innovative approaches that would improve mobility facilities, infrastructure, technologies, networks, and services, the mobility mapping workshops were considered important.

### **3.1 The Study Area: Metro Manila, Philippines**

Metro Manila, the National Capital Region of the Philippines is consisted of sixteen (16) cities including Caloocan, Las Pinas, Makati, Mandaluyong, Manila, Marikina, Muntinlupa, Malabon, Navotas, Paranaque, Pasay, Pasig, Quezon City, San Juan, Taguig, Valenzuela and one (1) town, Pateros. The largest of which is Quezon City.

Metro Manila is considered one of the modern metropolises in Southeast Asia. It is the political, economic, social and cultural center of the Philippines. Metro Manila is the smallest of the

country's administrative regions but is the most densely populated at 11M (2011 census) with an area of only 636 square kilometers. The region is bordered by the provinces of Bulacan to the North, Rizal to the East, and Cavite and Laguna to the South. It is also bounded by Manila Bay to the west and Laguna de Bay to the southeast with the Pasig River running between them (Figure 1).

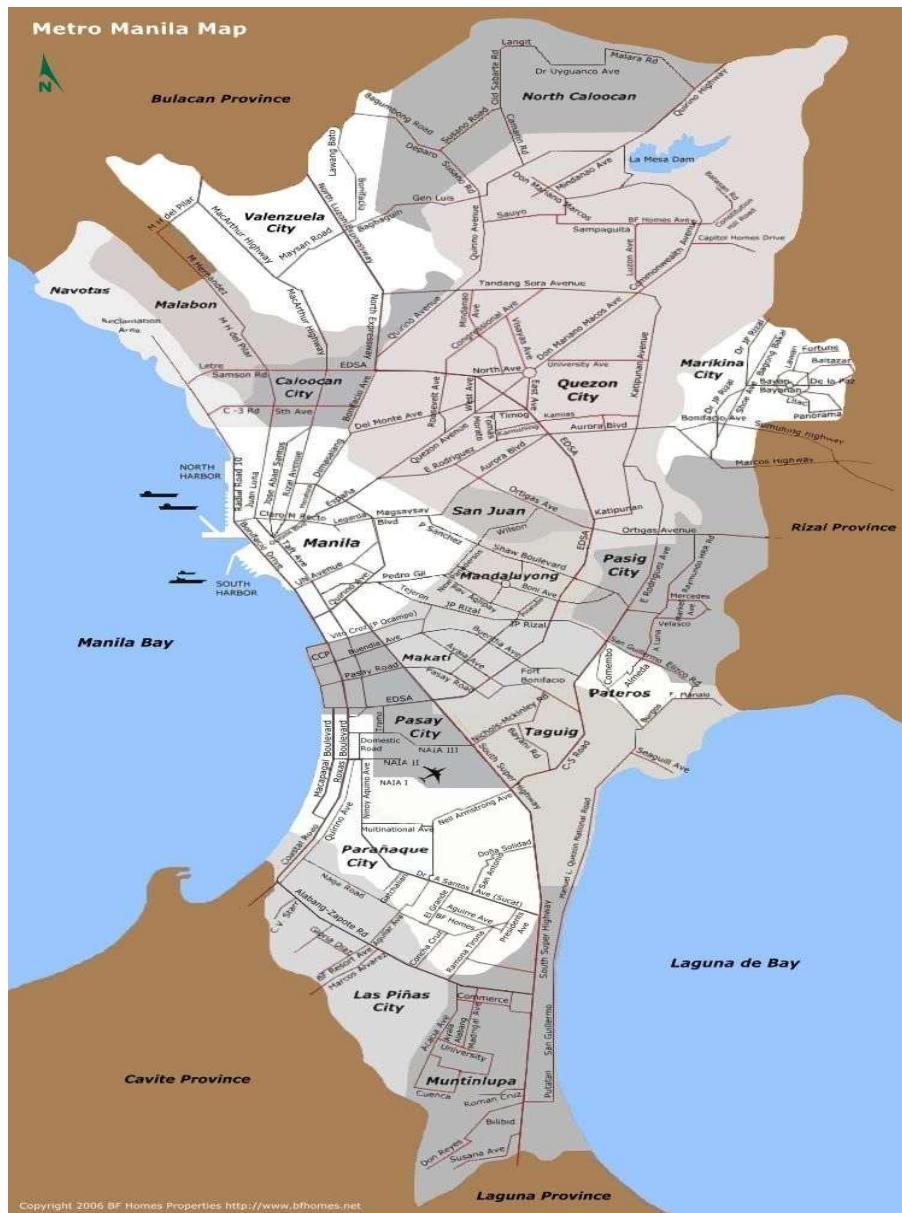


Figure 1. Map of Metro Manila, Philippines  
Source: <http://mapsof.net/map/metro-metropolitan-manila-map>

In Metro Manila, three mapping workshops were held. Two were area-based and one was mode-specific. The two area-based mapping sessions were held in Quezon City North Central Business District (CBD) and Ortigas CBD, the latter was basically bounded by three cities-Mandaluyong, Pasig and Quezon City.

One mode-specific session was intended for bicycle advocates. It is important to note that the Philippines do not have a “bicycle culture” and as such this mode is not fully integrated in the transport network of most Philippine cities.

For these mapping workshops, the tasks included getting participants from different sectors such as those from the national government and local government, non-government organizations, advocacy groups, academe, business sector including the transport sector and entrepreneurs, as well as representatives of urban poor and the vulnerable groups.

Participants were given tags to identify their affiliation and/or background. Depending on the total number of the participants, diversity in the group were encouraged and ideally each participant have some knowledge of the transport features of the selected focus map segment, knowledge on what is connected and have a sense of humour, creativity, civic duty and passion for improvement.

### **3.2 Mapping Requirements**

The mapping workshop requires the following workshop tools and supplies

1. An easel or flipchart for documenting discussions
2. Tracing paper for providing information without marking the base focus map to increase its reusability
3. Round colored sticker dots (0.5 inch and 0.25 inch in diameter in red, blue, green, purple, orange, yellow and white colors)
4. Color markers for labelling added map features onto post-it notes
5. Masking tape for general use
6. Scissors for general use
7. Magnifying glass for general use

Less tangible resources needed

1. Diverse colleagues/group members
2. Knowledge of some of the transport features in the selected focus map segment
3. Some of knowledge in what is connected
4. Sense of humor and creativity
5. Sense of civic duty/passion for improvement

### **3.3 Mapping Process**

To start the mapping process, groups were formed. Each participant is in one of the workshop groups usually composed of five (5) to eight (8) members around a table. For each participant there is a name tag and color dots which tells the institution/discipline that one is representing eg. government, NGO, big business, small venture, or academe. Each group is represented by every color and that one is requested to join a group where he/she knows the least number of people.

### **3.4 Mapping Workshop Tasks**

To get started, one of the group members volunteers to be a note taker. Then, the group

identifies a volunteer to report back to the whole group at the end, and then a self identified group chair or facilitator is identified to keep work of the group on topic and schedule. The facilitator instructs each participant to introduce themselves to the group mates by saying their name, followed by what they are hopeful about, something positive or what he/she like in Metro Manila's transportation system.

The first step is revealing the new mobility grid by checking the maps on the table and identifying connection points and then finding new areas to connect using the small or big ideas eg. an application for iPhone to improve mobility, or a new BRT system, or a system wide traffic management system, or a bike share system.

The second step is identifying the area where one can start working on the various ideas that have been identified. Questions like what are the first steps to make them happen, what economic benefits can these activities bring, how they can save money, how they can create new business/services/innovations. This step identifies immediate, short-term and long-term implementation opportunities.

Third is the “moving minds” part where participants portrayed their project eg. putting up the application, telling the story of the integrated system, involving marketing, finding way and helping people figure out how things are connected. This also identifies opportunities for “moving money”.

Note takers were asked to tally at least five research questions needed in order to serve the project. They were also asked to jot down policies that are needed to implement such innovative projects. The groups were asked to identify people they believe should be at the table with them.

At the plenary, the groups reported their outputs. They were reminded that if they are stuck on one thing, they should try moving to another just to keep the flow moving.

### **3.5 Quezon City: Pilot SMART Mapping Workshop**

The pilot SMART mapping workshop was co-organized by the Ateneo School of Government with the University of Michigan-SMART Initiative and held at the Occupational Safety and Health Centre of the Department of Labor and Employment in North Avenue Corner Agham Road, Quezon City in 01 February 2012. It was attended by 38 individuals from 25 private sector representatives, government representatives and academic institutions working on or with interest in the transportation system of Metro Manila including the ASEAN GTZ Clean Air for Small Cities Project, Clean Air Initiative (CAI)-Asia, Department of Labor and Employment, Ayala Land Inc. , Parasatabi, The Nature Group, National Economic Development, Open Street Map Philippines, Philippine Science High School, Department of Transportation, Metropolitan Manila Development Authority , Brgy. South Triangle, Palafox Associates, Entrepreneur Society of the Philippines, League of Cities of the Philippines, INNOVENSY, GTVSP, among others.

Quezon City, the biggest city in Metro Manila is also the most populous city in the Philippines. It was named after the President of the Philippines who founded and developed it to replace Manila as the country's capital. Having been the national capital, it is the location of many government offices including the House of Representatives which is the lower chamber of

Philippine Congress. It is also an academic haven, having the main campuses of the two biggest and noteworthy universities, the Ateneo de Manila University and the country's national university, the University of the Philippines as well as malls like the SM North EDSA and Trinoma.

#### The Walking Tour of QC North CBD: Trinoma-SM North Area

An innovation for this workshop was the participants' walking tour of Quezon City North Central Business District. The participants walked along the sidewalk of North Avenue, crossed the street using the overpass, passed through the North Avenue Terminal station, crossed the pedestrian crossing area and back to the venue. They were reminded to be observant of the transport facilities and services and note the issues as well as opportunities around.



Figure 2 Mapping workshop participants walking in North CBD, Quezon City

#### 3.6 Ortigas Central Business District (Mandaluyong City, Pasig City and Quezon City)

On the 13th of March 2012, a month after the first mapping workshop in Quezon City, the second mapping workshop was conducted in the Asian Development Bank (ADB), Auditorium B in Ortigas Centre. This was led in partnership with CAI-Asia, one of the institutions that participated in the first mapping workshop.

The Ortigas Central Business District (CBD) is the second most important financial district after the Makati CBD. It occupies more than a hundred hectares and is located at the boundaries of Pasig City, Mandaluyong City and Quezon City. It is home to numerous shopping malls, office and condominium skyscrapers and other building complexes and restaurants including the third largest mall in the country, SM Megamall as well as the headquarters of ADB, San Miguel Corporation, Jollibee Foods Corporation. It is surrounded by the streets of EDSA to the west, Ortigas Avenue to the north, Meralco Avenue to the east

and Shaw Boulevard to the south. It is governed by the Ortigas Centre Association Inc.

The second mapping workshop was inspired by the first workshop that challenges the participants to do something on the initial opportunities presented by the new mobility grid. The mapping process became one of the tools to advance the sustainable transport paradigm through the avoid-shift-improve measures. CAI Asia also promotes the paradigm which reduces greenhouse gas emissions, energy consumption in transport, congestion and hopefully, one that will ultimately create a truly livable city. This is complementing one of the the inclusive mobility goals of better transportations systems for all but most especially to the poor and the vulnerable group.

The mapping workshop followed the same pattern as the first one. There was a walking tour around Asian Development Bank. The participants first went out of ADB gate facing SM Megamall, the biggest mall in the area, walked though the sidewalk along EDSA (near Ortigas MRT station), then it turned left to Guadix Drive and re-entered ADB through the ADB Avenue entrance. The participants were reminded to be more observant of the area that they walked through.



Figure 3. Participants walking around ADB Building, Ortigas, Mandaluyong city

Immediately following the short break was the workshop proper which was patterned after the initial one. A total of 63 participants from different sectors including five local government units (LGUs), six from national government agencies, nine from the private/business sector, twelve from the academe, three from the media, fifteen from non-government organizations (NGOs), religious groups and funding institutions joined the workshop. Each participant was asked to introduce her/himself as well as asked the kind of mode/ used in coming to the venue. The facilitator highlighted the mapping workshop is designed for the different stakeholders to work together towards inclusive mobility, one that even persons with disabilities can commute hassle-free.



Figure 4. Participants in the SMART Mapping for Inclusive Mobility

### 3.6 NMT Forum and Mapping in Metro Manila

Inspired by the first two inclusive mobility mapping process where advocates of NMT were always present, the NMT Forum and mapping workshop was held last 21 April 2012. It coincided with the Earth Day celebration. The third mapping workshop was conducted with the cycling advocates like Firefly Brigade, Cycling Advocates and Bike for the Philippines and the OpenStreet Map, a group of volunteers and mapping hobbyist. A total of 52 participants attended, 15 were from the NMT sector, 12 from national and local government units, eight from the academe, six from the media, four from the private sector, three from NGOs and four from the online mapping group

The forum provided a venue for the sharing of the different initiatives on advancing NMT by the different groups.



Figure 5. Presentation of Ms. Mia Bunao of Firefly Brigade

The mapping exercise followed the same pattern of the previous ones except that it focused on the bicycles, its infrastructure, issues and opportunities. The mapping exercise specific objectives were (1) to reveal and assess existing and potential NMT features and facilities; (2) to provide stakeholders an opportunity to work together in advancing the implementation of sustainable, connected, inclusive transport system and sharing mobility-related information and policy initiatives; and (3) learn to use available free and open source web platforms to build on the shareable knowledge base of inclusive mobility enhancing features of the transport system.

#### 4. RESULTS/FINDINGS

The results of the three (3) mapping workshops in Metro Manila were interesting. Table 1 showed the gathering of the stakeholders to participate and become catalysts for inclusive mobility initiatives. The increase of participants from the first workshop in Quezon City can indicate the need for this kind of workshop. Specifically for NMT, getting so many participants on a weekend (Saturday) showed that there is a growing demand to address the NMT issue in Metro Manila.

As expected given transport sector theme, by gender, many of the participants are male. Interestingly, on the average, there are more participants coming from the non-transport related sector. This could indicate the growing interest of the “not-so-usual suspects” to be part of the mobility solutions in Metro Manila.

Table 1. Type of Inclusive SMART Mobility Mapping Participants

	Quezon City	Pasig City	NMT Specific	Ave. no.of participants
Total No. of Participants	38	63	52	51

<i>Gender</i>				
Male	20	36	37	31
Female	18	27	15	20
<i>Sector</i>				
Transport-related sector	15	30	26	24
Non-Transport related sector	23	33	26	27

Participants actively participated identified the existing and potential transport mobility grid including informal hubs and other uncharted transport system features in each mobility mapping session.

The first mapping exercise became an inspiration for the Operation Katipunan, a multi-sectoral volunteer group based at Barangay Loyola where many of the universities and schools are located to work together for a pedestrian-friendly Katipunan. Currently, the area is known for its poor facilities for walking and its pedestrian areas are often used for parking vehicles.



Figure 6. Participants mapping

Interestingly, in cooperation with the organizers, the second mapping activity in Ortigas CBD was led by one of the participants in the initial mapping activity that University of Michigan-SMART and Ateneo School of Government-Inclusive Mobility Project conducted in Quezon City North CBD. This particular activity led to a significant media mileage and action for the city of Pasig to launch its car-less day initiative every Sunday in one stretch of Ortigas CBD.



Figure 7 Participants of the Carless Sunday in Emerald St, Ortigas

The NMT mapping forum and workshop is a good illustration where participants of the first and second area-based mapping workshop realized the importance of sharing each other's initiatives and of seeing the interconnections in order to strengthen the momentum towards including non-motorized transportation across the whole transportation system for inclusive mobility.



Figure 8. Mr. Villar of Open StreetMap explaining the online mapping process

The workshop concluded a mapping of bicycle hubs (e.g. retail and repair shops and meeting areas) in Metro Manila. Some provided tips and trivia on cycling like where to get cheap sturdy bicycles, the ideal time to cycle, possible livelihood opportunities relating to bicycles.

Local government units like Pasig City and Marikina also shared their initiatives towards promoting the use of bicycles. All the mapping activities were able to build on and further extend the shareable knowledge base of inclusive mobility.

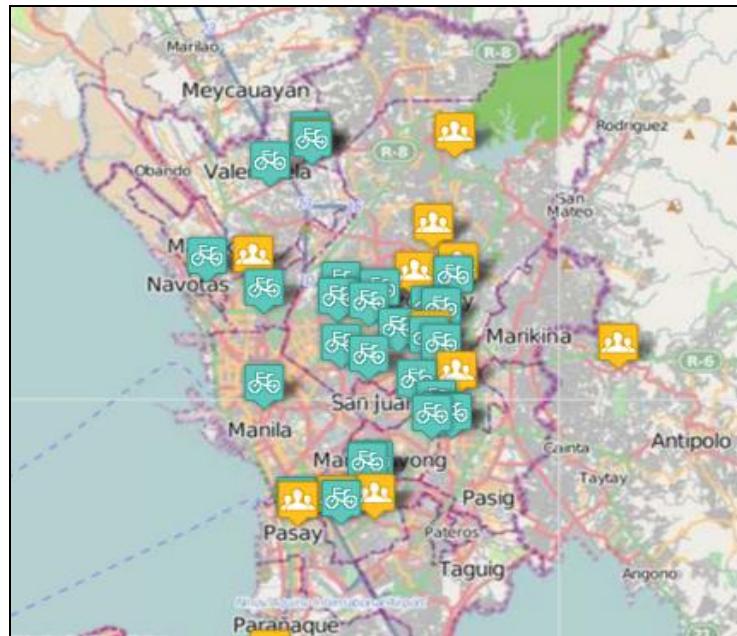


Figure 9. Result of OpenStreet Map

## 5. IMPLICATIONS FOR RESEARCH/POLICY/IMPLEMENTATION

The findings in these workshops suggest the benefits of utilizing a socially responsive approach in cities of developing nations in investigating issues related to mobility as well as determining resources and setting processes and partnerships in a place that could help improve the system. The transport sector is traditionally viewed as a male dominated one given that its project is usually infrastructure/vehicle heavy one. However, given the increasing traffic problem due to high vehicle ownership in the cities of most developed nations, the need to involve the “not-so-usual” suspects in the sector especially those that could help catalyze the behavioral change in implementing the sustainable transport framework of “avoid-shift-improve” becomes more imperative. Involving the different stakeholders while educating and gaining catalysts for the inclusive mobility advocacy and project ownership is a novel feature of this study. This also offers insights into which combination of new inclusive planning approaches can potentially lead to tapping new resources in improving the transportation system

## ACKNOWLEDGEMENTS

The authors would like to acknowledge the Rockefeller Foundation for its generous support to the Inclusive Mobility Project of the Ateneo School of Government and the SMART Initiative of University of Michigan.

## **REFERENCES**

- Cass, N. et al (2005). Social Exclusion, Mobility and Access. *The Sociological Review*, 53-3, 539-555
- Social Exclusion Unit (2003). Making the Connections:Final Report on Transport and Social Exclusion. Office of the Deputy Prime Minister, UK
- Inclusive Mobility Project (2012). Pilot SMART Mapping Workshop Documentation Report. Ateneo School of Government
- Inclusive Mobility Project (2012).New Mobility Mapping Workshop Ortigas CBD and Surrounding Areas Documentation Report, Ateneo School of Government
- Inclusive Mobility Project (2012). Non-Motorized Transport Forum and Mapping Workshop Documentation Report. School of Government
- World Bank (2011). Mobility Mapping. Available at  
[http://siteresources.worldbank.org/EXTTOPPSISOU/Resources/1424002-1185304794278/4026035-1185375653056/4028835-1185375938992/3\\_Mobility\\_mapping.pdf](http://siteresources.worldbank.org/EXTTOPPSISOU/Resources/1424002-1185304794278/4026035-1185375653056/4028835-1185375938992/3_Mobility_mapping.pdf)
- Zielinski, Sue (2009). Connecting and Transforming the Future of Transportation: a brief and practical primer for implementing sustainable door-to-door transportation systems in communities and regions world-wide. University of Michigan 2009.  
<http://deepblue.lib.umich.edu/handle/2027.42/85216>