Ford Urban Mobility Networks: Providing Solutions to Social and Environmental Problems in Urban Slums of Developing Regions

São Paulo, Brazil

by

Luke Barber

Emily Plews

Alexandra Wilson

A project submitted
in partial fulfillment of the requirements
for the degree of
Master of Science
School of Natural Resources and Environment
at the University of Michigan

April 2009

Faculty Advisor:

Dr. Thomas Gladwin

ABSTRACT

Building upon the work of a series of previous SNRE master's projects, our team has identified New Mobility as a potential set of solutions to many of the social and environmental problems related to mobility and accessibility within urban slums of São Paulo, Brazil. New Mobility systems are highly integrated, environmentally sound, and socially equitable systems of moving people and goods. Implementing such systems as a solution to urbanization mega-trends is an innovative concept in that previous solutions to addressing slums (i.e., slum-upgrading) did not comprehensively consider mobility, and solutions to transportation problems (i.e., mass transit, hub networks, etc) either completely ignored or minimally considered slum residents. Insights garnered from this new perspective on New Mobility in slums were then applied to recommendations to the Ford Motor Company on potential paths to co-creating an equitable, efficient, and profitable system of transportation in São Paulo. This research argues heavily for the importance of partnerships outside traditional transportation agencies and offers new ways of looking at typical business relationships.

ACKNOWLEDGEMENTS

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INTRODUCTION

Global Trends

Empirical evidence gathered by the UN-HABITAT states that four out of ten inhabitants in the developing world are informal settlers, and the global slum population is likely to increase to at least two billion in the next 30 years.[1] Although the term "slum" is applied to a variety of settlement types, a slum is an area characterized by social and economic isolation, irregular land ownership, and low-standard sanitary and environmental conditions.[2] This projected increase in urban populations will tax already inadequate transportation systems in the developing world, thereby reducing access to mobility and forcing the poorest residents to spend a disproportionately high amount of their income and time on meeting mobility needs.

Moreover, according to the International Energy Agency, 23% of worldwide CO_2 emissions from fuel combustion in 2007 came from the transportation sector, making the restructuring of this sector a global, as well as regional, imperative.[3] The growing awareness of the social, environmental and economic impacts associated with climate change, air pollution and other negative externalities associated with increases in vehicular traffic have already begun to highlight the importance of developing more efficient and accessible modes of transportation. The increasing urban population is one of the main drivers of the rising trend in CO_2 emissions from the transportation sector.

Our research advances the theories of new mobility, which currently do not explicitly address the plight of slum dwellers. The social benefit is potentially enormous worldwide,

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[1] United Nations Human Settlements Programme, UN-HABITAT, *Facing the Slum Challenge: Global Report on Human Settlements, 2003* (Detroit: Earthscan/James & James, 2003)

[2] United Nations Human Settlements Programme, UN-HABITAT, *Slums of the World: The Face of Urban Poverty in the New Millennium?: Monitoring the Millennium Development Goal, Target 11--World-Wide Slum Dweller Estimation* (New York: BPR, 2003)

[3] Daniel de Moraes João, Alexandre R. Ferriera, "The influence of Brazilian's Transport on CO2 Emissions," *IV Congresso Nacional De Excelencia Em Gestao,* 2008

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as billions are projected to live in slums in the coming decades, compared with the already staggering number that live in slums today. Our research intends to improve their lives by offering low-cost options for mobility and accessibility as well as realizing the opportunity for a multinational corporation to utilize their breadth of knowledge, influence, and capital to work towards environmentally and socially sustainable mobility solutions.

New mobility systems are highly integrated, environmentally sound, and socially equitable systems of moving people and goods. This innovative concept seeks to bridge the existing gap between slum upgrading programs that have ignored mobility and transportation programs that have ignored slums. The potential improvement in accessibility provided by our innovative system will in turn provide greater economic opportunity to the residents.

Working in conjunction with the Sustainable Mobility and Accessibility Research and Technology (SMART) project at the University of Michigan and the Ford Motor Company (Ford), we have assessed the potential for a new mobility system to serve the people of São Paulo, Brazil, including the urban poor. Our assessment and subsequent recommendations are intended to provide insight into the design and processes necessary for an Urban Mobility Network (UMN) business to successfully function in São Paulo, Brazil.

The following is a contextual background and preliminary plan for implementing new mobility in São Paulo. It applies to a variety of vested stakeholders such as NGOs, businesses, and communities. Though our research is designed to provide insight regarding mobility solutions specific to São Paulo, the findings and the process of analysis will offer insight into how new mobility can be approached in other developing country mega-cities and slums. In addition, we have prepared an analysis and recommendations tailored to a case neighborhood, Uniao de Vila Nova, also known as Pantanal. These recommendations are both for immediate use as well as to foreshadow the course of development over the next decade and beyond for slums undergoing upgrading.

São Paulo, Brazil

History

São Paulo was a small coffee growing state until the 20th century when it became a booming industrial city encouraging a rapid influx of people from the poorer northern states. In the first half of the 1900's, urbanism established a spatial order in the city in terms of class as well as following the U.S. car based model of growth.[4] The city grew rapidly and exponentially—today São Paulo is home to 10% of Brazilians on only 0.9% of Brazil's land area.[5] Today, the entire metropolitan area, São Paulo city and 38 neighboring municipalities (SPMR), has a population of approximately 19 million people.

See Appendices F through K for maps of São Paulo.

The city of São Paulo, although not the center of Brazilian politics, is undoubtedly the center of the Brazilian economy, contributing 16% of the national GDP. São Paulo accounts for 15% of Brazil's industry and are the headquarters for "the most important industrial, commercial, and financial concerns controlling the country's private economic activities."[6]

While São Paulo is the wealthiest city in Brazil, the region is still characterized "by profound inequalities and social imbalances,"[7] as can be seen with the stark juxtaposition of wealthy neighborhoods and favelas. *(See Image 1 below)*

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[4] Mariana Fix, Pedro Arantes, Giselle Tanaka, "The Case of Sao Paulo, Brazil," in The Challenge of Slums: Global Report on Human Settlements, ed. United Nations Human Settlements Programme (Sterling, VA: Earthscan Publications, 2003)

[5] Ivo Imparato and Jeff Ruster, *Slum Upgrading and Participation: Lessons from Latin America* (Washington DC: World Bank Publications, 2004), 333.

[6] Ibid.

[7] Ibid.

Image 1: Favela Paraisopolis next to the Morumbi district. (Photo: miragestudio7)

Transportation

Currently, São Paulo is fraught with some of the worst transportation problems in the world—heavy single-passenger automobile congestion, a slow (albeit extensive) bus system inhibited by traffic, an inadequately sized underground metro system, and a lack of government funds or political longevity to make necessary improvements. In a historical study of mobility in São Paulo, the authors conclude the congestion is a result of "intense growth in motorization and relatively scarce investment in the transportation system and the highway network."[8] Furthermore, the passenger car is continuously popular despite the traffic and already evident environmental implications, likely because the automobile remains the fastest mode of transportation as the bus—the most widely used form of public transportation—is inefficient and slow.[9]

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[8] Orlando Strambi and Karin-Anne van de Bilt. "Untangling Factors Behind Temporal Evolution of Mobility: Case of Sao Paulo, Brazil," *Transportation Research Record* 1807. (2002), 137

[9] Eduardo A. Vasconcellos, "Urban Transport and Equity: the case of Sao Paulo," *World Transport Policy & Practice* 4, no. 1 (1998), 12

For a city so vital to the economy of Brazil as a whole, the transportation situation in São Paulo has become a very serious problem. According to the city transportation department, traffic disruption costs São Paulo and its residents "about 4.1 billion reais a year," or about 1.8 billion USD, due to lost business opportunities as a result of missed meetings, etc.[10] With traffic congestion becoming so severe—jams can stretch more than 130 miles in the metropolitan region—and public transportation remaining unattractive, the city's rich have taken to helicopters for their daily commutes.[11] São Paulo is now the world's helicopter capital, surpassing even Tokyo and New York City. This, contrasted with the fact that many of the poorest in São Paulo walk to work because of the costliness of public transportation,[12] presents both an unsettling situation as well as a compelling challenge.

As the image (*Image 2*) below demonstrates visually, the transportation system in São Paulo is not only inefficient, but also socially inequitable. The study by Eduardo Vasconcellos found that the people of the poorest income brackets spent 50% more time walking to transit stations or stops than those wealthier income brackets. [13] Interestingly, those able to afford cars generally live closer to the city center, while car ownership decreases significantly in the poorer, peripheral areas. This trend, which is highly unlike an American city, exacerbates the social inequity surrounding mobility and accessibility in São Paulo.

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[10] Heloiza Canassa, "Sao Paulo Traffic Jams Mean Lost Business, Stress, Helicopters," *Bloomberg.* July 15, 2008. http://www.bloomberg.com/apps/news?pid=20601086&sid=aAwzOeXmIxgk

[11] Tom Phillips, "High above Sao Paulo's choked streets, the rich cruise a new highway," *The Guardian*. June 20, 2008. http://www.guardian.co.uk/world/2008/jun/20/brazil?gusrc=rss&feed=uknews

[12] See note 4 above.

[13] See note 9 above.

Image 2: Handcart used to transport goods and supplies in the city. (Photo: Wilson)

Transit in São Paulo is also highly dangerous—more than 2,500 people die each year in traffic accidents.[14] The photo below displays one of the most dangerous methods of personal transportation—the motorcycle. Due to their ability to navigate in and out of traffic jams, the use of motorcycles has exploded. (*See Image 3 below*)

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[14] Vasconcellos, "Urban Transport and Equity,"14

Image 3: Motorcycles parked throughout the city (Photo: Wilson)

A multi-modal new mobility transportation network would increase the efficiency of the existing personal cars, buses, and other forms of transportation, in turn changing the way people think and operate regarding mobility and accessibility to goods and services. Increasing transportation efficiency and decreasing reliance on the personal car will move São Paulo towards becoming a more environmentally sustainable city while creating substantial social benefits by improving access for the poorest residents. Improving accessibility and mobility for the poor will benefit the economy of the city, as studies show that greater access to jobs is the factor most beneficial to the status of the poor.[15]

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[15] Jorge Fiori, Liz Riley, Ronaldo Ramirez, "Urban Poverty Alleviation Through Environmental Upgrading in Rio de Janiero: Favela Bairro," *UK Department for International Development,* (2000)

Housing

The period between the 1930 and 1980 is referred to as the Brazilian "National Development." In this time there was a mass migration from the rural North of Brazil to the urban, industrial South. Wide spread industrialization spurred an economic boom and, for a time, the demand for workers matched the supply. When the boom reversed in the 1980's, the people remained in the cities without prospect for social ascent and the pattern of urban life and urban development quickly changed. In the absence of a Master Plan for the city between 1930 and 1971 and residual preference for an elite central city, a proliferation of working class families established homes in shantytowns with little or no infrastructure in the periphery of São Paulo.[16] There were instances where slums grew in the center city, but few remain today as a result of decades of slum upgrade policy under military rule (1964-1985) that encouraged relocation to the periphery over integration.

Although São Paulo's economy has grown significantly in recent decades, there is still not a balance between workers and work and the slum persists as commonplace in the city and periphery. In 2003, approximately 26% of the population of São Paulo resided in urban slum conditions.[17] Urban slums, in São Paulo or any urban area, are varied and should be understood on many dimensions. UN-Habitat developed the following housing standards to apply to the urban poor:

1. Durable housing of a permanent nature that protects against extreme climate conditions.

2. Sufficient living space, which means not more than three people sharing the same room.

3. Easy access to safe water in sufficient amounts at an affordable price.

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[16] See note 4 above.

[17] See note 4 above.

4. Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of   people.

5. Security of tenure that prevents forced evictions.[18]

In São Paulo, slums are classified as a favela, irregular settlement, or cortiço and are distinguished primarily by the average earnings of the inhabitants and the availability of basic infrastructure.

Favelas are inhabited by families earning less than $675 USD per month. Buildings in favelas are self-built on private or public lands. Residents have problems with land and property ownership. Infrastructure and public services are precarious or non-existent. In 2008, there were 1,566 favelas that housed 380,000 household and covered 23 km squared of land. Fifty percent of the favelas had fewer than 100 homes. *(See Image 4 below.)*

Irregular settlements are inhabited by families earning less than $1350 USD per month. These are also self-built houses, but there is reasonable infrastructure in the neighborhood. Land and tenure rights are in dispute because of land use and parceling regulation, illegal acquisition of property, etc. There were 1,152 irregular settlements in 2008 that housed 300,000 households in 2008.

Tenements, or cortiços, are officially registered buildings rented to low-income families. The buildings are known for poor internal access and infrastructure and overcrowding. There were 1,885 cortiços in 2008.[19] *(See Image 5)*

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[18] See note 1 above.

[19] Municipal Housing Secretariat, "Municipality of Sao Paulo Policy Guidelines and Strategic Plan for

According to a survey conducted by SEADE and the São Paulo Municipality department of housing, in favelas and settlements, 56.8% of respondents had been residents for over 10 years and 77.9 % own the physical structure of their homes.
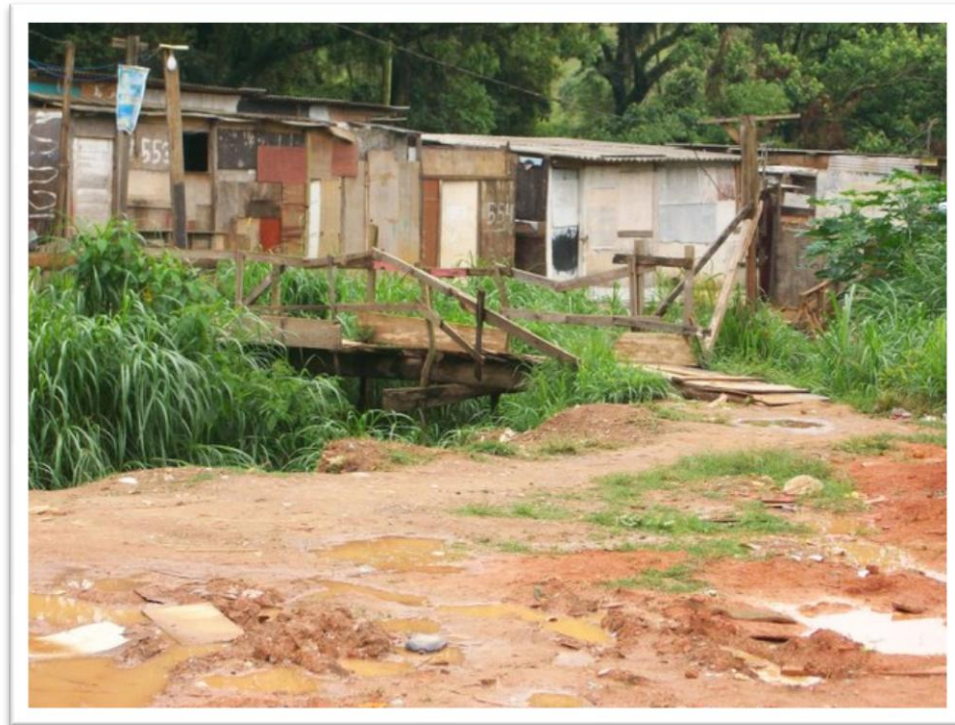
Image 4: Newly built favela structures located in Santa Isabela. (Photo: Wilson)

Housing" Proceedings from Alianca de Cidades Cities Without Slums Conference March 10-14, 2008. São Paulo, Brazil. http://www.citiesalliance.org/doc/events/2008/sao-paulo/sao-paulo/sao-paulo-housing-policy-eng.pdf

Image 5: A cortiço located next to the São Paulo Museum of Art in downtown São Paulo.
(Photo: Barber)

What is missing from these definitions are certain characteristics of slums that are nearly universal, such as proximity to environmentally sensitive areas. The majority of São Paulo's slums are located in land that is difficult or hazardous to develop, like floodplains, landfills, and hillsides. The areas often provide important, albeit not economically valued, ecological services like watershed management.

Case Study Pantanal

During our field research we toured three different kinds of slums in the periphery of São Paulo. While some of the largest favelas, like Heliopolis and Pariasopolis, are near to the city center, we intentionally sought out the peripheral slums, as they represent the geographic situation of the majority of slums. All three of the slums we toured would be classified as favelas under the city definitions for slums. During our tour we assessed the "readiness" of each slum for new mobility solutions. "Readiness" is not to be confused

with need as all three favelas could greatly benefit from improved access to transit systems. Primary "readiness" factors included existing or foreseeable walkable or bikeable access to roads, bus stops, or railway stations and foreseeable access to stable electricity and telecommunications infrastructure. Social factors of "readiness" like community leadership, and decreasing trend violence, were also considered. The perceived high correlation between existing and foreseeable "readiness" and government assistance with urbanization was undeniable. Moreover, the need to include transport and accessibility in plans for slum upgrading was clear.

In one favela receiving little governmental assistance, the necessary infrastructure for new mobility was not there, nor was it foreseeable. (*See Image 6)* In the remaining two favelas, we saw existing infrastructure or reasonably expect necessary infrastructure to be in place soon based on plans for or likelihood of government upgrades. The assumption, based on understanding discussed in the Government Chapter, is that government commitment to slum upgrading is established. The government led push for slum urbanization could easily coincide with the creation of an equitable new mobility system in São Paulo.

Image 6: Santa Isabela. (Photo: Barber)

To demonstrate this connection we will apply general concepts to a case study favela with foreseeable "readiness" for new mobility. The case study favela is named União de Vila Nova and is informally known as Pantanal. It is located within the following political jurisdictions:

São Paulo Metropolitan Region

São Paulo City

São Miguel Paulista (Borough)

Vila Jacui (District)[20]

In Pantanal, approximately 8,300 families currently enter and exit the neighborhood through one of two narrow access points that connects the neighborhood to the outside community. The most direct access point is actually a tunnel that runs under a railway track. The commuter rail line nearly encompasses the neighborhood but the nearest stops are still far away. When residents leave the neighborhood, they do so on crowded, infrequent buses, on foot or on a bicycle. There are internal roads, mostly dirt, but very few cars and no space for parking.[21]

Fortunately, Pantanal has received significant attention from the state government. The completed and planned upgrades are both infrastructural and social and span decades. *(See Images 7 and 8)*

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[20] "CDHU licita obras para segunda fase do Projeto Pantanal," Governo de Sao Paulo-SP Noticias, March 9, 2008, http://www.saopaulo.sp.gov.br/spnoticias/lenoticia.php?id=98347

[21] Ibid.

Image 7: Pantanal in process of upgrading. (Photo: Barber)

Image 8: Section of Pantanal after upgrading process. (Photo: Barber)

THE ROLE OF GOVERNMENT

Structure and Responsibility

Government officials publicly recognize the pressing problems with transportation: congestion, particulate air pollution, and long commute times. There is very minimal evidence from media, actions, or plans, that they also consider the relationship between transportation and social inequities. New mobility, by definition, suggests that this way of thinking about transport systems is imperative and should be standard. This difference in understanding may partially explain why it has been difficult for representatives of the Ford Motor Company and SMART to feel momentum behind new mobility solutions in Brazil. According to interviews with Ford employees and research discussed in this report, the most challenging and important step toward advancing a UMN in Brazil is forging a meaningful relationship with government. Moreover, Ford employees attributed failed attempts at forging relationships with other non-government organizations, in part, to connections those organizations had to government. [22] Undeniably, government, on many levels, must be a partner in any new mobility network.

This chapter is meant to provide the contextual understanding of Brazilian governance and power structures in relevant policy arenas. It will attempt to clarify why some of these missteps have occurred and inform suggestions as to how new mobility partners may proceed in the future that will be discussed in detail in the Recommendations chapter.

All levels of government must be considered when assessing the opportunities and risks of implementing new mobility hub solutions in São Paulo metropolis and its slum areas. The dimensions of importance to this particular assessment include government's basic power structures, process for creating transportation, environmental and slum upgrade policy, the role of non-government organizations and social movements and policy formation. To the extent possible, we will try to illuminate the relevant governance as they relate to our

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[22] David Berdish, interview by Emily Plews and Alexandra Wilson, Ann Arbor, MI, February 12, 2009 and David Breedlove, interview by report by Emily Plews and Alexandra Wilson, Detroit, MI, March 6, 2009.

case study of Pantanal favela. Insight and understanding of these topics will be used to craft recommendations to Ford and SMART in the Recommendations chapter.

Basic Government Structure

According to the U.S. Department of State, there are three political jurisdictions of government: federal, state, municipality and a single federal district. The federal government has three branches: executive, legislative and judicial. The executive branch is primarily responsible for administration and policy creation. The president leads the executive branch for a four-year term and can be reelected only once. The legislative branch is comprised of the Federal Senate and the Chamber of Deputies. The Federal Senate has 81 members elected to eight-year terms. Senate spots are fixed and evenly appropriated to the 26 states. The Chamber of Deputies has 513 members elected to four year terms. The Deputies are elected by state in proportion to its population. São Paulo state is limited to 70 representatives.[23]

This federal structure is replicated at the state level with a state governor at the head of the executive branch, two chambers of the legislative branch and a judiciary branch. The term lengths also mirror those at the federal level.

There is an important administrative structure that covers a jurisdiction smaller than the state but larger than São Paulo city. The political and geographic lines that divide São Paulo city and 38 of its surrounding municipalities, like Guarulhos, have become nearly indistinguishable as urbanization overtook the region. These 39 municipalities that constitute the region are legally established under a new metropolitan authority named Região Metropolitana de São Paulo (SPMR). The SPMR developed by chance and not one participating municipality "has much wish or incentive to collaborate."[24] It does not hold

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[23] U.S. Department of State, Bureau of Western Hemisphere Affairs, *Background Note: Brazil,* http://www.state.gov/r/pa/ei/bgn/35640.htm

[24] Peter Ward, " Contemporary Issues in the Government and Administration of Latin American Mega-cities," in The Mega-city in Latin America," ed. Alan Gilbert (Tokyo: United Nations University Press, 1996). http://www.unu.edu/unupress/unupbooks/uu23me/uu23me09.htm

elections but the governments of each municipality are increasingly connected to create regional policy solutions.

Government structure at the municipality level differs from the structure at the federal and state levels. Only large cities, like São Paulo, have a judicial branch. In the place of a state governor or federal president, municipalities elect a mayor and vice-mayor team. A municipality's city council, "Camara Municipal," is most similar to state and federal legislatures, but the council's role and authority varies by municipality. Mayors and vice-mayors serve four-year terms and can be reelected once. São Paulo has 55 members on its city council. There is no limit to the number of times council members can be reelected. Mayor and council members are autonomous and there is no hierarchical structure to their relationship. There are also few instances where the council is more powerful than the mayor. [25]

São Paulo municipality, or city, is further divided into 31 separate subprefectures, also called boroughs. Subprefectures may be further divided into districts. There are 96 districts in São Paulo city. Each level of municipal government-city, borough or district- has authority and financial provisions to execute a host of public services. The central municipality, São Paulo, determines the extent of authority each sub-administrative level can exercise. [26] The term "municipality" is used frequently but often refers to different governing bodies. The actions of administration at the city, borough, and district level may all be referred to as actions of municipal governments.

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[25] See note 24 above.

[26] James Holston, *Insurgent Citizenship: Disjunctions of Democracy and Modernity in Brazil.* (Princeton and Ontario, Princeton University Press, 2008),150.

Title	Name	Elected	Political Party
President – Federative Republic of Brazil	Luiz Inácio Lula da Silva	2006	Workers' Party (center- left)
São Paulo State Governor	José Serra	2008	Brazilian Social Democratic Party (center- left)
São Paulo Municipality Mayor	Gilberto Kassab	2006	Democratic party (center-right)

Case Study Pantanal—Pantanal is located on the east side of São Paulo city, in the São Miguel Paulista borough and in the district of Vila Jacuí. In our case study, we will explain the governance structures that are relevant to this neighborhood. Government officials from Vila Jacuí, São Miguel Paulista, São Paulo city, and São Paulo state all share responsibility for Pantanal as it falls in their geographic region. The neighborhood is participating in São Paulo state government upgrade project called Projeto Pantanal managed by CDHU (more on CDHU in the Slum Upgrading Policy section below).

Elections

All members of executive and legislative branches at any level are elected by direct vote. Governors and mayors must win by more than 50% of the vote, which often requires a second round run-off between the top two candidates. Brazil has compulsory suffrage for citizens over the age of 18. Qualified citizens who do not vote may be subject to fine or community service consequences. As such, voter turnout is very high as evidenced by the 81% voter turn out in the 2006 presidential election.

As the urban poor represent a significant percentage of the voting population of São Paulo

municipality and São Paulo state, politicians go to great lengths to reach out to those communities and highlight the policies that will help the people in this voting block. In October 2008, we noticed a great deal of political advertising painted on the walls of the favelas we toured. *(See Image 9 below)*

See Appendix A for an election schedule.

Image 9: Election signage in the Santa Isabela favela. (Photo: Wilson)

Constitution

The political context of Brazil must be considered with the understanding that the government was completely restructured a little more than two decades ago with a new national constitution promulgated in 1988. As the country moved from military rule to

democratic rule, the constitution established one of the most decentralized power structures of modern times.

Several articles of the constitution are of particular relevance when understanding the political climate for housing, environmental, and transportation policy and administration. Articles 182 and 183 discuss how the responsibility to provide "decent housing … security of tenure, adequate sanitary installations, reasonable living conditions, and access to essential public services" falls on these more local authorities.[27] Article 35 establishes the joint competence of the Union, the states, the federal district and the municipalities and states that federal and state government cannot intervene with municipalities unless the municipality:

- is negligent in debt payments for two years

- does not report its financial operations

- does not spend the legally required amounts in education

- violates a national or state constitutional principle

- does not observe a judicial mandate[28]

In a decentralized system, Article 35 is intended to temper the potential for redundancies. However, there is significant literature and anecdotal evidence to show that Brazil is still struggling to create communication channels that would facilitate joint competence. The São Paulo Municipality Housing Department explicitly set a goal to encourage better coordination between municipality, state, and federal levels of government.[29]

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[27] Philip Harrison, Marie Huchzermeyer, and Mzwanele Mayekiso, "Confronting Fragmentation: Housing and Urban Development in a Democratising Society" (Lansdowne, Cape Town: University of Cape Town Press, 2003), 193.

[28] International Constitutional Law. Brazil-Constitution http://www.servat.unibe.ch/icl/br00000_.html

[29] See note 19 above.

Political Parties

The youth of the Brazilian democracy makes it difficult to draw conclusions about policy and election trends and futures based on political party. This is unlike the U.S. where there are a few well-defined parties that enable voters to anticipate election outcomes and policy decisions once in office. Similar adjectives like "right," "left," and "center" are used to describe Brazilian political parties and are intended to convey a similar message about the parties' inclination to favor business development or social programs. Authors of the case study of São Paulo slums included in the United Nations' Global Report on Human Settlements said the following of political parties in São Paulo:

> Overall, the right's priorities for the city are major public construction projects (in general, for road building), public safety, populist social programmes, real estate business, dialogue with the business community and privatized administration. The left's priorities are improving public services (education and healthcare), housing, transportation, democratic management, participatory budgeting, and dialogue with social movements.[30]

There are 20 political parties represented in Congress.[31] Some of the more popular parties include:

Name	Abbreviation	Political Leaning
Workers' Party	PT	Center-Left
Democrats	DEM	Center-Right
Brazilian Democratic	PMDB	Center

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[30] Fix, "The Case of São Paulo, Brazil," 8.

[31] See note 23 above.

Movement Party		
Brazilian Social Democratic Party	PSDB	Center-Left
Progressive Party	PP	Right

It is difficult for any one party to maintain control over the majority of the legislature, gubernatorial and mayoral positions because of the array of political parties. It is fairly common for the left and right-leaning parties to form coalitions to gain more power in congress and in total numbers of governors and mayors, as was seen in 2006 when the Workers Party formed a coalition with the center PMDB party to form a majority in congress. [32] Even when an elected or campaigning official is affiliated with a party, there is still debate over how much one's party affiliation affects their voting habits when in office. Some experts say "party membership is critical," [33] whereas others say party loyalty is weak.[34] Politicians often switch parties before an election and in office.[35]

In October 2008 the Workers' Party, led by two-term Brazilian President Luiz Inacio Lula da Silva, was said to have suffered a serious set back when conservative Gilberto Kassab (DEM) won the role of São Paulo city mayor over the incumbent Workers' Party candidate. Many political analysts tout the mayoral role in São Paulo as a springboard to the presidential election with its eight million voters. Some project that the conservative vote in 2008, will make conservative São Paulo state governor, José Serra, a likely front-runner in the 2010 presidential election. [36]

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[32] See note 23 above.

[33] See note 24 above.

[34] See note 23 above.

[35] See note 23 above.

[36] Newsroom, "José Serra Odds-on Favorite as Next Brazil President, After Lula's Setback," Brazil Mag. October 27, 2008, http://www.brazzilmag.com/content/view/10095/54/

As mentioned above, this switch from six years of Lula and the Workers' Party popularity to leadership under a more conservative leader, could indicate a change in policy in many areas that would affect the creation of a UMN in São Paulo: U.S. Brazilian relations, transportation planning objectives, approach to slums, and commitment to environmental protection and climate change mitigation.

A social movement called Movimento Nossa São Paulo recently effected amendment number 30 of the organic law of the city to ensure continuity of policies that promote sustainability and social justice in many areas. The law states:

> The Mayor, elected or reelected, will present the Program Goals of its management, until ninety days after his inauguration, which will include priorities: the strategic actions, indicators and quantitative targets for each of the sectors of Municipal government, and sub districts of the city, noting at least the guidelines of their election campaign and the goals, the guidelines, the strategic actions and other rules of law of the Strategic Master Plan.
>
> 4 The mayor may make changes in the Program Goals always in accordance with the law of the Strategic Master Plan, giving them in writing and disseminating them widely by the media in this article.
>
> 5 The performance indicators will be developed and fixed according to the following criteria:
>
> a) promote the development environmentally, socially and economically sustainable; b) social inclusion, reduction of regional and social inequalities; c) addressing the social functions of the city with improved quality of urban life; d) promote compliance with the social function of property; e) promotion and protection of individual and social rights of every person; f) promotion of ecologically balanced environment and combat pollution in all its forms; g) the universal service of public services with local with the

conditions of regularity, continuity, efficiency, speed and courtesy in service to the citizen, security, today with the best techniques, methods, processes and equipment, and prices they deem unlike the public economic conditions of the population.[37]

Power and Authority

After 1988, governors and large city mayors in Brazil have acquired a great deal of power. Local governments are given explicit responsibility for urban planning and land development and urban transport among other things. The chart below provides a very basic understanding for how authority is divided.

Table: Division of Responsibility in Brazil

Sector	Local	State	Federal
Land Development	■		
Water, Sewage		■	■
Household Refuse	■		
Energy Distribution		■	
Urban Transport	■		
Housing	■	■	■
Healthcare	■	■	■
Education	■	■	■

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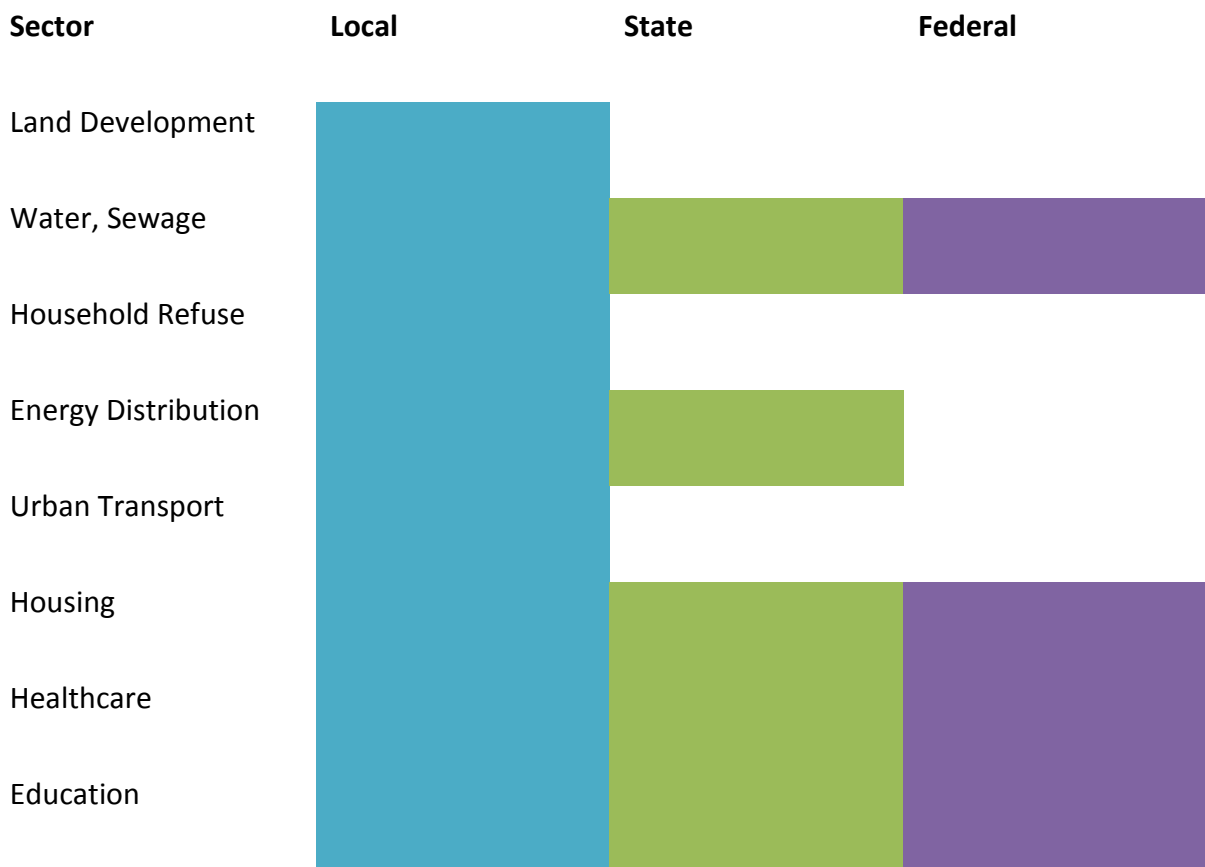
[37] Movimento Nossa Sao Paulo,"Program Goals - Amendment to the Organic Law of the City."
http://www.nossasaopaulo.org.br/portal/

The responsibility for public services is not as simple as the above chart might suggest. In fact, there are some notable instances where reality deviates. As urbanization progresses, São Paulo state government has retained control over transportation and maintains a robust urban development and housing program, despite the responsibility for these services falling to the municipality as well. To confuse this further, mega cities like São Paulo form consultative bodies to improve communication between administrative units. Peter Ward, University of Texas Professor of Latin American studies, offers the following critique of the consultative bodies, "…these bodies achieve little because they threaten existing power structures within each administrative area. As a result, they are little more than "letterhead" bodies with little in the way of effective power." [39]

While the decentralized government intended to foster localized solutions, the problems it has created clearly fair share of problems as well. Brazilian governance is fraught with redundancy of programming, budget shortages, lack of planning, and unhealthy competition among agencies. Financially strapped local governments often opt to completely privatize or subsidize functions that cannot be effectively provided with limited government resources. An example of this is the privatized buses in São Paulo. Individual agencies ignore each others' needs and programs, and, at worst, actually compete with one another.[40] An excellent example of this tendency are rural electrification programs Luz para Todos and Luz no Campo, which are providing a nearly identical service in the same geographic region but managed by different government agencies. Peter Ward also indicates that the principal impediment to effective administration in Latin American cities is the lack of an overall planning authority to coordinate functions of different sector agents. [41]

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[38] World Local Authorities, *Brazil: Responsibilities*, 2005, accessed April 11, 2009, http://www.almwla.org

[39] See note 24 above.

[40] See note 24 above.

[41] See note 24 above.

Business and Government

As privatization of public services increases, the power that government exerts over business leaders increases. Many companies, especially those in industries that support public services, heavily rely on the government to generate revenues. In an interview with Ford employees, the influence of government in business decisions was one of the main barriers to forging partnerships with Brazilian businesses. [42]

Corruption

All understanding of governance, partnerships, and business must be tempered by the reality of corruption in Brazil. According to Transparency International, corruption is defined as the abuse of entrusted power for personal gain.[43] On the 2007 Corruption Perception Index, Brazil scored a 3.5 on a scale from zero to ten when ten is highly clean and zero is very corrupt. This survey reflects the opinions of business people and country analysts.[44] Corrupt business dealings and political actions enhance inequity in the market and in society. The following paragraphs are intended to highlight the inherent risks of Ford will face while establishing a UMN in São Paulo.

As mentioned earlier in the election section of this chapter, the perception of Brazilian politicians is generally negative due to frequent exposure of corruption in government. When asked about the extent to which certain institutions are affected by corruption, Brazilian survey participants ranked the following relatively high: political parties, parliament/legislature, judiciary, and police. [45] Moreover, 73% of respondents said that the Brazilian government was ineffective in the fight against corruption.[46]

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[42] See note 22 above.

[43] Robin Hodess and Juanita Riano, "Transparency International Bribe Payers Index 2008," *Transparency International*, December 9, 2008, http://www.transparency.org/news_room/in_focus/2008/bpi_2008

[44] J. Graf Lambsdorff, "Corruption Perceptions Index 2008," *Transparency International*, http://www.transparency.org/layout/set/print/policy_research/surveys_indices/cpi/2008

[45] See note 43 above.

[46] See note 43 above.

The negative perception of government is far from unfounded. The following stories reveal the prevalence of corruption in Brazilian politics. According to an article published in The Economist September 2006, "Almost a fifth of the deputies in Congress's lower house have been implicated either in a cash-for-votes scandal involving the Workers' Party or in a scheme to buy over-priced ambulances."[47] Transperancia Brasil, a non-government organization whose mission is to combat corruption in Brazil, found that "39% of 496 candidates for the lower house (in 2003), face(d) legal proceedings."[48] "The Brazilian Court of Accounts reported that the government completed only 12% of the projects initiated in 2007, whereas Headquarters of the Office of the President contends that 80% have been completed"[49]

Funding and Budgeting

States and municipalities get money from taxes, transfers from the federal government, revenue sharing arrangements with privatized public services or from loans with outside parties.

State Funding

States levy many kinds of tax: ICMS tax on circulated goods and services, IPVA tax on motor vehicles, ITD tax on donations and legacies, progressive land taxes, IVA value-added tax, and fuel taxes. ICMS and IPVA are redistributed in part to the municipalities and the IVA value-added tax percentage is actually set at the federal level.[50]

States receive automatic transfers of federal dollars for healthcare and from the States Participation Fund (FPE) on the basis of population and income per capita, after deduction of any debt owed by the federated states to the federal government. States are also

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[47] "Contentment and Complacency, *The Economist*, September 2006, 36.

[48] Ibid.

[49] Susan Schaller, "Nouveau Riche Brazil Hasn't Learned How to Spread the Wealth," Brazzil, September 2008, 1.

[50] World Local Authorities, *Brazil: Responsibilities*, 2005, accessed April 11, 2009, http://www.almwla.org

eligible for a host of optional transfers based on exports, manufactured goods, teachers' salaries, gold transactions, etc. A quarter of the total optional transfers must be allocated to education spending. Discretionary transfers are also provided on a case-by-case basis. A Federated State may borrow after a double vote from its assembly and from the national assembly, be it for internal or external borrowing. [51]

Municipality funding

The majority of funding for municipalities comes from federal transfers, but they do levy the following taxes: IPTU tax on urban landed property, ISS tax on services, and tax on property transactions. Federal law dictates a ceiling to municipal tax rates.[52]

Municipalities receive transfers from the federal and state government. The federal government transfers funds from the Municipalities Participation Fund (FPM). Ten percent of the FPM is distributed to the capital cities, as a function of their demographic size and of their revenue per capita, and the remaining 90% is distributed to the other municipalities according to population. [53]

The federal transfer to the healthcare system is determined in discretionary manner but is largely a function of population and healthcare programs. There are transfers similar to the optional transfers to states. Similarly a quarter of the total amount of these transfers must be allocated to education expenditure. Voluntary grants are transferred at the federal and state governments' discretion.[54]

A municipality must have its borrowing project approved by the city council and Congress, which has established indebtedness ceilings for the municipalities. Municipal governments

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[51] Ibid.

[52] Ibid.

[53] Ibid.

[54] Ibid.

often borrow from commercial banks on a short-term basis. [55]

Budgeting

State and local governments are collectively trying to bring budgets back in balance. São Paulo has a participatory budgeting process. In 2002, 12% of the total municipal budget was set in the participatory budgeting process. By law, only individual citizens can participate, but leaders of community organizations participate at substantial rates.[56]

Privatization of Public Services

According to Ward, "Every government in Latin America now recognizes the need to cut expenditure and reduce subsidies. Most governments are reducing subsidies on public transport, infrastructure, and services."[57]

Many public services have gone through a process called "municipalization," or privatization, as municipality administrations feel budget crunches and pressure from conservative politicians and parties. Government agencies often spin off a company in which they own the majority stock. Please see discussion of slum upgrading policy at the state level for an example of CDHU, a "municipalized company."

Policy

Transportation Policy

Understanding transportation policy will make it easier to identify opportunities, potential partners, and stakeholders. Transportation governance is in the process of transitioning

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[55] Ibid.

[56] Adrián Gurza Lavalle, Arnab Acharya and Peter P. Houtzager, "Beyond comparative anecdotalism: lessons on civil society and participation from São Paulo, Brazil," World Development 33 no. 6: (2005), 951.

[57] See note 24 above.

from municipality to metropolitan region and state. See the Appendix C for the name of the transportation authority for each political jurisdiction.

São Paulo State's Secretary of Transport—São Paulo State's Secretary of Transport is responsible for developing a transportation system and coordinating means of transport of the State. The Department of Transport is in charge of the highway department (DER), the Department Aeroviário the State of São Paulo (Daesp), the water department (DH), and Road Development. The Secretary of Metropolitan Transport falls under the Governor of São Paulo State's office, but it is considered a different organization from the Secretary of Transport. [58]

Secretary for Metropolitan Transport (STM)—The Metropolitan Bureau of Transportation was established in 1991 and is responsible for implementation of state policy for urban transport of passengers in the metropolitan areas, covering metroviário systems, rail, bus and trolley-bus and other modes of interest. [59] STM is also responsible for "the organization, coordination, and monitoring the operation of the metropolitan public transport of passengers and their road infrastructure, including:

- The completion of the planning of public transport in regional character and development, implementation and monitoring of programs and works for its compliance and control;

- The establishment of rules and regulations relating to planning, to deployment, to expand, improving, the operation and maintenance services;

- The granting of concessions, permits and authorizations for services, reviewing and setting their tariffs in accordance with law.

- The promotion of the metropolitan public transport of passengers in the

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[58] Governer of the State of Sao Paulo, Secretary of Transport. "Mission Statement," http://www.transportes.sp.gov.br/v20/missao.asp

[59] Governer of the State of Sao Paulo, Secretary of Metropolitan Transport. http://www.stm.sp.gov.br/

municipalities members of the metropolitan regions, may be held in conjunction with other public agencies or private entities that act in the sector. "[60]

In the 1996 book entitled *The Mega-city in Latin America*, contributor Oscar Figueroa said, "fragmentation of responsibility for urban transport is the rule in most of the cities. [São Paulo] does not have a metropolitan authority with full responsibility for transportation."[61] Figueroa also said that in São Paulo, although control of transport is predominately in the hands of the municipal authorities, the regions have as many regulatory bodies as the municipalities.[62] Eduardo A. Vasconcellos attributes the myriad of environmental and social problems experienced in São Paulo transportation in part to policy disco-ordination and economic difficulties with the state and corresponding efforts to deregulate and privatize. [63]

As mentioned in the Basic Government Structure section above, one of the criticisms of decentralization is the strain that it puts on municipal and state budgets that often spurs the privatization of public services. São Paulo 's transit system could not escape this fate. Until recently, bus companies were regulated through an innovative practice called "municipalization." The municipality contracted private firms to operate services given performance criteria such as distance traveled per day. The contracted companies would then pay a fee to the municipality.[64]

Transportation Policy in the Future—STM has publicized plans for the Urban Transports Integrated Program (PITU) 2025, which encourages the establishment of public transport network, searching not only to integrate the different transportation modes in terminals but also their complementarities in innovative ways. The PITU 2025

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[60] Ibid.

[61] Oscar Figueroa, "A hundred million journeys a day: The management of Transport in Latin America's mega-cities," in *The Mega-city in Latin America*," ed. Alan Gilbert (Tokyo: United Nations University Press, 1996). http://www.unu.edu/unupress/unupbooks/uu23me/uu23me09.htm

[62] Ibid.

[63] Vasconcellos, "Urban Transport and Equity," 18.

[64] See note 61 above.

acknowledges the link between transit and equality explicitly. The plans were elaborated by experts in urban transportation planning, mayors and technicians of the municipalities of the metropolitan region of São Paulo.

The details of the plan were further described as follows during a conference hosted by Urban Age in December of 2008:

> The PITU 2025 implies very few extensions to the commuter rail network, but a considerable improvement using profits generating from the separation of freight transport. The PITU proposal calls for the partial duplication of lines with new expressways, a single extension outwards as well as the extension of several lines inwards to make them all converge in one area. It also envisages two new lines, one of which will be an express train to the airport. In terms of bus corridors, besides adding more than 300 km to the network, PITU proposes 110 km of 'urban corridors' including passing points to increase their speed to the equivalent of a BRT system. The proposal projects a total of 580 km of new corridors by 2025. To generate these significant change, the system should be highly integrated, a priority of PITU 2025, which calls for 15 key terminals connecting the different modes of transport. Future terminals would start in the metro system and connect directly to buses or rail services at street level.[65]

There is reason to suspect the PITU initiatives will be of particular relevance as all of Brazil prepares to host the World Cup games in 2014. Jonas Hagen with the Institute for Transportation and Development Policy said, "In preparation for hosting the World Cup in 2014, cities such as São Paulo … discussed their transportation plans, including a bus rapid transit, metros and bicycles."[66] We can already see these commitments coming to action

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[65] Ciro Biderman, "Sao Paulo's urban transport infrastructure," *Urban Age*, (2008,) http://www.urban-age.net/0_downloads/archive/_SA/13_NewsPaper_Essay_Biderman.pdf

[66] Jonas Hagen, "Major sporting events catalyze Brazilian Cities' Transport Plans," Institute for Transportation Development and Policy, December 21, 2008. http://www.itdp.org/index.php/projects/update/major_sporting_events_catalyze_brazilian_cities_transport

in São Paulo Metropolitan Region as "Marcos Kassab of the São Paulo Metro presented plans to extend the rail based network from 117 kilometres of "metro quality" transport to 244 kilometers by 2010."[67]

   Case Study Pantanal—According to the upgrade plans for the Projeto Pantanal published by CDHU, there are plans for transportation upgrades specific to the neighborhood. In addition to neighborhood road improvements, the plan mentioned increased access to the railway that nearly encompasses União de Vila Nova. In January 2009, Companhia Paulista de Trens Metropolitanos (CPTM) announced plans to build a rail station that will service the people of the Pantanal region.[68] The station will not be situated directly in the neighborhood, but it will be near. It is difficult to determine what policy measures were implemented to spur the development of this train station, which appears to also have historical relevance in its proposed situ. The plan coverage in the media did quote a religious leader from the neighborhood. Two philanthropic events prior to the January announcement involving CPTM, CDHU and Pantanal residents and NGOs have been publicized, which suggests that a relationship was established between the two agencies. To add to the uncertainty, São Miguel also published a city plan that discusses plans for rail transportation upgrades that will service the people living in Vila Jacuí.

Slum Upgrade Policy

As we discuss in the overview, there is a clear link between socio-economic inequity and accessibility to public transit in São Paulo. Moreover, slums identified for upgrading through the state or municipality are generally more "ready" to be connected to a new mobility hub. According to a paper published by Brazil's Institute of Applied Economic

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[67] Ibid.

[68] Lais Cattasinni, "Project provides train stopped at San Miguel by the end of 2010," CPTM Official Thread http://www.skyscrapercity.com/showthread.php?t=446150&highlight=CPTM&page=228

Research, results "indicate that the areas of [São Paulo] with the largest improvements in urbanization were also those with a more positive evolution of the socio-economic indicators such as income and education."[69] Understanding the policies and players in slum upgrading policy will make it easier to identify opportunities, potential partners, and stakeholders.

As mentioned in the introduction, there are different kinds of slums in Brazil. It follows that different kinds of upgrades would be applicable for each. Although the 1988 federal constitution recognizes housing as a vital basic need for works, policies that effectively integrate the urban poor into the rest of the city have only recently been implemented. During military rule, the approach to slums was one of social exclusion.[70]

Federal programs and appropriations for slum upgrades—The current President of Brazil, Lula, grew up in an São Paulo favela. Many argue that his roots in this community have parlayed into greater action and resources for upgrades. The federal government approved a federal urban development policy "after 13 years of discussion… which mobilizes some of the measures contained within Brazil's 1988 constitution to improve urban living conditions ... for lower-income groups."[71] Lula created a group called the "Ministry of Cities" to implement the "Habitar Brasil," which is a program for the urbanization of favelas in over 30 locations throughout the country, including São Paulo.[72] In August 2007, Lula announced an initial investment of $4.2 billion in the PAC (Growth Acceleration Program) including an array of infrastructure projects that aim to improve the conditions of some of Brazil's largest favelas.[73] "As Brazil's economy continues to improve, social programs are receiving increased funding and visibility from the

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[69] Rute Rodrigues, "Slums upgrading in Brazil during the 1990s: An evaluation using census data," *Institute of Applied Economic Research Fourth Urban Research Symposium* 2007, 2.

[70] Fix, "The Case of São Paulo, Brazil," 3.

[71] Jessica Budds, Paulo Teixeira and SEHAB, "Ensuring the right to the city: pro-poor housing, urban development and tenure legalization in São Paulo, Brazil," *Environment and Urbanization* 17, no. 1: 89.

[72] Cecelia Jorge, "Brazil's modest plan to eradicate favelas," Brazzil Magazine, January 31, 2005. http://www.brazzilmag.com/content/view/1306/

[73] See note 49 above.

government."[74] On May 7, 2008, civil minister announced that and unprecedented $1.3 billion had already been spent. [75]

The approach to slums at this level has historically changed as opposing political parties take office, but there are signs that the approach to social integration made popular under PT leaders may endure regardless of a change in power. Right-leaning political parties have historically viewed slums as problems while officials from left leaning political parties view slums as social spaces that should be integrated into the city. Promisingly, the current São Paulo Mayor, Gilberto Kassab, promised, "the ending of São Paulo slums in 10 years" despite his conservative party affiliation.[76]

State programs and appropriations for slum upgrades—At the state level there is a Department of Housing under the Governor's office that sets guidelines and goals and develops programs for slum urbanization. Generally speaking, the Company of Housing and Urban Development, (CDHU) executes the plans. CDHU is a company whose majority shares are owned by the State of São Paulo. The Department of Housing says its challenge is "to maintain macro-production of housing on a large scale, at cost, to address the housing deficit of the state now estimated at about 400 thousand units."[77]

São Paulo municipality programs and appropriations for slum upgrades—During a recent presentation to the Cities Alliance, representatives from São Paulo's Municipal Secretariat of Housing and Urban Development (SEHAB) sited millennium goals of sustainable urban development, reversing loss of environmental resources, and improving the quality of life for the people living in favelas among the driving forces of the agencies

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[74] Ibid.

[75] Ibid.

[76] Adauri Barbosa, "Kassab promises end to slum in ten years," O Globo Online. October, 10, 2008
http://oglobo.globo.com/pais/eleicoes2008/mat/2008/10/10/kassab_promete_acabar_com_favelas_em_dez _anos-549787139.asp

[77] Governo do Estado de Sao Paulo: Secretaria de Habitacao, "Conheça melhor a secretaria da habitação"
http://www.habitacao.sp.gov.br/conheca-melhor-a-secretaria-da-habitacao/index.asp

projects.[78] São Paulo has been part of a City Alliance partnership over the past eight years regarding slum upgrading. In this alliance, there are multiple cities with urban slums from around the globe sharing limited funding and a great deal of insight into best practices and lessons learned.[79]

The Municipal Housing Council supervises, tracks and monitors Municipal Housing Policy and finances. The Housing department now uses Habisp, which is an information system to map housing in the city.[80] This information helps the municipality determine demand for and prioritization of slum upgrade interventions. The following programs are housed in Municipal Secretariat of Housing and Urban Development (SEHAB):

- HABI

  - Favelas and tenements

  - Five regions within São Paulo

- COHAB

  - Production of new housing units

  - Manages the Municipal Housing Fund

- RESOLO

  - Irregular settlements and land regularization

  - Thirty-one subprefectures[81]

Through SEHAB, 38 favelas housing 74,000 families are being urbanized or will be

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[78] See note 19 above.

[79] The Cities Alliance, "The Host: Sao Paulo," *Slum Upgrading Up Close: Experiences of Six Cities,* (Cities Alliance, 2008). http://www.citiesalliance.org/doc/resources/upgrading/su-up-close/su-up-close.pdf

[80] Municipal Housing Secretariat, "Municipality of Sao Paulo Policy Guidelines and Strategic Plan for Housing"

[81] Municipal Housing Secretariat, "Municipality of Sao Paulo Policy Guidelines and Strategic Plan for Housing"

urbanized according to plans under design.[82] Most of the upgrade plans focus on infrastructure and accessibility to basic needs while creating community; the plans routinely create central green space and improve education, nutrition, and healthcare. There was no mention of connecting the neighborhoods to public transit.

Tenure and Land Rights—The implications of changes in housing and land policy are not as directly related to new mobility opportunities as changes in transportation or slum upgrade policies, however, they must be understood as the broader movements for social equity affect the potential for a new mobility Hub. As mentioned in the introduction, slums can be classified in terms of the rights the people have to stay or own the land or building. Politically, tenure and land rights have been the most difficult component of urbanization. Although in recent years there has been significant momentum towards social integration and official government recognition of slums, there is hardly consensus regarding housing and land rights. Even Lula's administration, which is know for its commitment to the urban poor, is reticent on the subject. "The (PAC) program is ominously silent on the subject of giving those occupying the lands in favelas deeds to their property, thus legitimizing their presence under Brazilian law."[83]

Not only is it difficult to achieve consensus regarding policies, but also difficult to create programs to execute those policies. São Paulo Municipality and SEHAB cite that 108 areas are being regularized, affecting 23,000 families.[84] Homeowners in favelas situated on public lands are awarded a "Concessions of Use for Housing Purposes," which is a document necessary to establish legal tenure of the property.[85] The 108 areas that will be regularized are all on public land, which makes it easier to administer. They acknowledge that the settlements are often illegally acquired, parceled, and rented private land, the process of legalization will be significantly more difficult. In these instances, the government agency will have to regulate the use of land that does not belong to the

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[82] Ibid.

[83] See note 49 above.

[84] See note 81 above.

[85] Ibid.

government.

Case Study Pantanal—Through CDHU's Projeto Pantanal, União de Vila Nova has seen many of the upgrades discussed in this section. The project has been divided into phases and will span many years.[86] Infrastructure improvements to roadways and buildings have been executed or planned. The neighborhood is situated on public land, which the residents do not own, but they can buy and sell the title to their buildings.

Environmental Policy

According to University of São Paulo's Pedro Jacobi, the city of São Paulo is "under an environmental crisis as a result of lack of attention, omission, delay, and inadequate managerial ability of local authorities."[87] Some of the major environmental governance issues for São Paulo include lack of permeable surfaces, flooding, air pollution, inadequate public transport that necessitates wide spread personal car use, waterway contamination, disposal of solid waste, land use, and, as recently acknowledged, climate change. As mentioned in the Basic Government Structure section above, environmental management is the responsibility of the "municipality." Nonetheless, there are agencies and policies of relevance at the state, municipality, and federal level of government.

Federal—Brazil is one of the largest global emitters of greenhouse gases (GHG), but they attribute most of those emissions to unsustainable land use, large livestock industry and mineral processing.[88] Brazil is known for its widespread use of hydroelectricity and ethanol, which reduces their GHG emissions in urban areas. [89] Until recently, Brazil has been reluctant to commit to national reduction goals on par with developed nations under

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[86] "CDHU licita obras para segunda fase do Projeto Pantanal"

http://internet.comunicacao.sp.gov.br/spnoticias/lenoticia.php?id=98347&c=6

[87] Peter Jacobi, "Environmental Problems in Sao Paulo: The challenge for co-responsibility and innovative crisis management," *Journal of Contingencies and Crisis Management* 5 no. 3, (1997)132.

[88] Leslie Neilson, "Background note, Climate Change Policy: Brazil, China, India, and Russia," *Parliament of Australia Parliamentary Library*, February 25, 2009, http://www.aph.gov.au/library/pubs/bn/2008-09/ClimateChange.htm

[89] Ibid.

the argument that the developed world contributed the majority of the accumulated carbon in the atmosphere. Policy and public opinion on climate change in Brazil has largely changed after the country experienced a series of natural disasters and IPCC reports on its vulnerability to climate change were released in 2007. It was not until December, 2008, that Brazil publicized national plans to mitigate greenhouse gases. The plan supports increased use of biofuels in the transport sector.[90] The National Environmental Council enacts resolutions like PROCONVE, which is an automotive emissions control program. [91]

State—São Paulo state has a Secretary of Environment (Meio Ambiente) and a company of Environment Technology (CETESP) that executes the management of resources. The programs and services offered at this level of government are robust and cover many areas not directly related to urban environmental concerns that are related to transport or slums. [92] The state secretary of environment implemented "Operacao Rodizio," which is a program that restricts the use of one's car to once a week according to the license plate number. The program is voluntary in that it is not enforced, and research suggests that there were documented decreases in carbon monoxide as a result.[93]

Following commitments made by São Paulo municipality, the state has committed to curbing 20% of carbon emissions by 2020.[94] No specific means to mitigate have been established at this time. Nonetheless, the State of São Paulo Research Foundation (FAPESP) announced a $63 million commitment to climate change vulnerability research in September 2008.[95]

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[90] Ibid.

[91] See note 87 above.

[92] "Organizational Structure- SMA," Governor of the State of Sao Paulo: Secretary of Environment and Green Space, http://www.ambiente.sp.gov.br/sma.php

[93] See note 87 above.

[94] Afra Balazina and Eduardo Geraque, "SP promete meta de redução de emissões," Folha Online, August 29,2008. http://www1.folha.uol.com.br/folha/ambiente/ult10007u439174.shtml

[95] Catarina Chagas, "Sao Paulo to invest $63 mission on climate research," Science and Development Network, Septemeber 15, 2008, http://www.scidev.net/en/news/s-o-paulo-to-invest-63-million-on-climate-research.html

Municipality—São Paulo city also has a Secretaria Municipal de Verde e Meio Ambiente (Environment and Green Space). This office oversees the following departments of relevance:

- Department of Environmental Quality Control - DECONT;
- Department of Environmental Education and Culture of Peace - Open University of the Environment and Culture of Peace - UMAPAZ;
- Department of Parks and Green Areas - DEPAVE;
- Department of Environmental Planning - DEPLAN;
- Department of Management Decentralization - DGD;
- Department of Promotion and Participation in Public Policy - DPP.[96]

São Paulo municipality was considering legislation that would reduce its carbon emissions by 30% by 2012.[97] Included among the proposed mitigation targets was a 10% annual reduction in public transit fossil fuel use.[98]

The U.S. Environmental Protection Agency (EPA) concluded a six year engagement with a team of Brazilian agencies at the end of 2004. The multinational team was to establish a framework for sustainable policies for the transport sector. The U.S. EPA worked with "São Paulo State Environmental Agency (CETESB), University of São Paulo, the Institute of Applied Economics Research, and two energy consultants."[99] The study evaluated the costs and benefits of many existing programs, including the PITU, which it found would foster "2,277 less hospital visits, 1,800 less deaths from air pollution-related causes between 2000 and 2020."[100] For more discussion on PITU, please see the Transportation Policy section above.

Operational Role of NGO and Social Movements in Policy

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[96] Prefeitura da Cidade de Sao Paulo, "Secretaria Municipal de Verde e Meio Ambiente :Organization" http://www2.prefeitura.sp.gov.br/secretarias/meio_ambiente/organizacao/0001

[97] Giovana Girardi, "SP terá de reduzir em 30% emissões de gases," *Estado de Hoje Metropole,* August 14, 2008, http://www.estadao.com.br/estadaodehoje/20080814/not_imp223477,0.php

[98] Ibid.

[99] U.S. Environmental Protection Agency, "Integrated Environmental Strategies: Brazil," March 25, 2009, http://www.epa.gov/ies/brazil/index.htm

[100] Ibid.

Since the ratification of the 1988 constitution, NGO's and Social Movements have changed their role in the political arena. As power has become decentralized and local tax dollars more closely watched, local groups have demonstrated "greater realism and pragmatism. They are seeking fewer grandiose changes and a qualitatively new effect in power relations."[101] "Civil organizations, representing different sectors of the poor, participate in substantial numbers in the formal participatory institutions and are likely to have substantial influence within such institutions.[102] "…the organizations that are most likely to represent the poor in participatory institutions are those well connected to the actors of classic representative democracy - political parties and state agencies."[103]

Some experts do not paint such a rosy view of the involvement of NGOs in the political process to improve the lives of the poor. Development economist Diana Mitlin is quoted as follows in Mike Davis' *Planet of Slums* in reference to NGOs in Latin America, "on one hand NGOs preempt community-level capacity building as they take over decision making and negotiating roles, while on the other hand, they are constrained by managing donor finance with its emphasis on … tangible outputs."[104] Davis also quotes an architect from Argentina who said, "NGOs monopolize expert knowledge and middlemen roles in the same way as traditional political machines." [105]

Integration of Transport, Slum Upgrade and Environmental Policy and Agencies

The trend in slum upgrade programs seems to be toward more integration. Across the different government agencies responsible for upgrading favelas, integration of transportation and environmental considerations is inconsistently executed or identified

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[101] See note 24 above.

[102] Adrian Gurza Lavalle, Arnab Acharya and Peter P. Houtzager, "Beyond Comparative Anecdotalism: Lessons on Civil Society and Participation from Sao Paulo, Brazil," *World Development* Vol. 33, 2005, 951–964.

Institute of Development Studies

[103] Ibid.

[104] Mike Davis, *Planet of Slums* (London: Verso, 2006), 77.

[105] Ibid.

in the upgrade plans. There appears to be no formal, reliable or robust partnership between transport and slum upgrading agencies, despite the often systemic linkage.

Non-Government Approaches to Slum Upgrading, Environmental Protection, and Transportation in São Paulo

Despite the continuous, improving efforts at all levels of government to protect natural resources, upgrade slum neighborhoods, and protect natural resources, many problem areas - slums, endangered resources, people with low accessibility to basic services - will not see government aid in the near future. These "low priority" problems seem to be identified as such because of their low density, low (environmental, natural catastrophe, etc.) risk, or visibility. Informal settlements that do not fall into these categories often become the projects of missionaries, NGOs, and grassroots social movements. For example, the Santa Isabela favela we toured received little to no attention from the local municipality; however, a team of missionaries has been providing social and infrastructural support to the neighborhood for years. The team of missionaries installed a connection to clean water sources. They will also host regular programs to encourage positive social development of the children. The leader of the missionary team, John Sooter, gave us a glimpse of the power of municipal governance when he eagerly wanted our research team to meet with the mayor of the district in which Santa Isabela is located.[106]

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[106] Sooter, John. Interview by Alexandra Wilson, Emily Plews, and Luke Barber. 18 October, 2008.

PARTNERSHIPS

It is helpful to examine examples of various partnerships and business arrangements that are similar to those necessary to create a new mobility network in São Paulo. By following the basic blueprint of new mobility implemented in Capetown and Bangalore, we have identified the following as necessary partners:

- Government

- Multinational companies

- National, regional, local Brazilian companies

- Non governmental organizations

- Academia

When giving special consideration for new mobility in favelas, as in our case study of Pantanal, all of the same partners would be necessary but as they relate to slum upgrading. We will elaborate on examples on multiple, various combinations of these partners that deserve additional explanation given the Brazilian context.

Please see Appendix D on potential Business Partners and Appendix E on potential NGO partners.

Foreign Companies in Public-Private Transportation Partnerships

The leaders of the Brazil, São Paulo state, and São Paulo city often make comments to news reporters about favorable conditions for foreign direct investment in their jurisdiction. With a similar frequency, the same three leaders speak to the increasing possibilities for public-private partnerships, particularly in the transport services. The website for the transportation department in São Paulo State says the following about private players in the public transport sector: "The State is proving that public transport is a good business for all involved. The investors have attractive returns on their

investments. Partnerships make possible investments that could not be considered by the government alone."[107] With the exception of one statement from São Paulo municipality mayor Gilberto Kassab, discussion of foreign companies engaging directly in the public-private opportunities is relatively quiet. Kassab told a Financial Times reporter that "new rules allowing public-private partnerships for the Brazilian city's infrastructure projects offer foreign companies huge opportunities."[108] It appears as though the Brazilian economy has seen increased foreign direct investment, but the Brazilian government is not eager to set up direct partnerships with multinational companies to actually provide the services or execute public works projects. For discussion of possible reasons for this, please see the business culture section of the Culture chapter.

Example Partnership Variations

The following were selected because they represent new variations that may be applicable to Ford as they consider new mobility business opportunities in São Paulo.

São Paulo Science and Technology Parks and Business Incubators

It is possible that technology and policy changes to support an UNM network may come from an "incubator-like" situation. Science and Technology parks intend to create an environment where technology companies, research institutions, and government can convene and create technology. [109] These initiatives create proximity that facilitates the transmission of knowledge, inspires synergy, and increases the efficiency and efficacy of development.[110] A project intended to inform policy for urban development, the São Paulo Science and Technology Park proved successful with the creation of variables that could

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[107] "Metropolitan transport, a good business," *Sao Paulo State Secretary of Metropolitan Transport,* http://www.stm.sp.gov.br/ingesp/english.html

[108] Jason Mitchell, "Partners welcome," *Foreign Direct Investment Magazine*, October 3, 2007, http://www.fdimagazine.com/news/fullstory.php/aid/2145/Partners_welcome.html

[109] Desiree Zouain, Devanildo Damiao, Mauro Catherino, "The Science and Technology Parks as instruments of public policies for promote the collaboration of technology based companies," Proceedings from PICMET 2007, 344.

[110] Ibid.

guide decision-making among the various partners. [111] According to University of São Paulo Professor Guilherme Plonski, the "institutional strategy of the Brazilian government is to channel federal support for research and development in university through industry rather than continuing to subsidize those efforts directly." [112] As of October, 2007, Brazil had approximately 400 incubators and leads "one of the most successful incubation movements in Latin America."[113] Universities are most often the catalysts but the government has made incubators a policy priority as witnessed by efforts to support incubators.[114]

IBM Innovation Center

Universities are not the only way to establish a business incubator in São Paulo as multinational companies are establishing similar organizations on their own volition. IBM opened an Innovation Center in São Paulo in February of 2009.[115] The innovation center was designed to service IBM's partnerships with "startups, venture capitalists, software vendors, and academics."[116] The center offers "training courses, consulting services and infrastructure to incubate new ideas."[117] IBM reports working with more than 1,000 of the estimated 2,000 internet-service providers in São Paulo. [118]

CEVA Transportation Example

In July of 2008, CEVA Logistics, a U.S. multinational company, announced a commodities

[111] Ibid.

[112] Guilherme Plonski, "Government/Industry/Academic Partnerships in Brazil," *Technology Management: the New International Language*, October 27, 1991, 582.

[113] Aruna Chandra, "Business incubation in Brazil: creating an environment for entrepreneurship," Indiana State University Networks Financial Institute Working Papers. October 1, 2007.

[114] Ibid.

[115] Camille Ricketts, "IBM opens center for business partners in Brazil," Venture Beat, February 4, 2009, http://venturebeat.com/2009/02/04/ibm-opens-new-centers-doors-to-business-partners-in-brazil/

[116] Ibid.

[117] Ibid.

[118] Ibid.

transportation project in partnership with BR-S Brasil Sistema Logistico.[119] CEVA and its partner will be the only commodities transport logistics organization to offer multimodal and multicargo containers (MMCs). BR-S developed the MMCs and CEVA will provide the logistics services. [120]

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[119] Diadema, "CEVA develops a multimodal transportation service for commodities in Brazil," *Logistics News,* July 29, 2008, http://www.cevashowfreight.nl/Press-Office/Press-Releases/Archive/CEVA-develops-a-...-Service-for-commodities

[120] Ibid.

CULTURAL CONSIDERATIONS

Brazilian Culture

In order to successfully establish a UMN, Ford must understand the culture of São Paulo and Brazil and the culture's potential ramifications for business operations. Cultural understanding should inform approaches to communications and network design as Ford moves forward with new mobility in São Paulo. This includes both the culture surrounding business, the "haves" of Brazil—who will become clients and partners, as well as the "have-nots"—the people of the favelas who's mobility and accessibility needs the UMN will aim to improve.

Brazil is the largest and most populous country in South America and the only with a national language other than Spanish—Portuguese. In addition, Brazil has more Catholics than any other country in the world. The people of Brazil, and especially of the São Paulo metropolitan area, are highly diverse with a large African population stemming from the slave trade, as well as deep-set European influences. São Paulo is most diverse; the State has the largest Japanese population outside of Japan, for example.[121] The culture of Brazil is much like other South American countries with the culture of machismo and history of dictatorships, but it is also unique in its diversity, economic and historical influences.

Business Culture and Norms

The term "custo brasil" refers to additional costs by businesses to accommodate government corruption and inefficiency and cultural differences.[122] Large foreign companies are advised to anticipate these "extra costs" and to create personal connections with government officials, as lobbying is prevalent and seemingly effective.

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[121] Consulate General of Japan in Sao Paulo, "The World of the Japanese-Brazilians in Sao Paulo," http://www.sp.br.emb-japan.go.jp/pt/comunidade_historico.htm

[122] The World Bank, *Brazil: The Custo Brasil Since 1990-92*, Public Sector Management and Private Sector Development Divisions (Washington, DC: World Bank, 1996) http://www-wds.worldbank.org/servlet/main?menuPK=64187510&pagePK=64193027&piPK=64187937&theSitePK=523679&entityID=000009265_3970311115139

This observation is not surprising in a culture that is often described as paternalistic and nepotistic. Many companies find Brazilian "despachantes," or middlemen, to help out with various dealings. These relationships often involve lavish gift giving and taking. According to the 2007 Brazil Country Commercial Guide published by the U.S. Department of Commerce, "the Brazilian government may not make a distinction between domestic and foreign-owned companies. However, in the case of a tie in the tendering process, preference is given to goods produced or services supplied by Brazilian firms."[123]

Here are some additional business culture insights:

- Informal and formal business meetings often start one hour later than the stated start time.
- Visitors usually bring gifts the first time they go to a company.
- Dress is usually formal.
- Negotiations are slower and reliant on personal contact. Brazilian executives do not react well to quick, infrequent visits from foreigners.
- Brazilians generally require less personal space than businesspeople in the U.S. during conversation.[124]

Corruption—The most common manifestation of corruption in Brazilian business is bribery. As mentioned, bribery has become so accepted in Brazilian business that it is often thought of as an expected additional cost. Despite the seeming acceptance of bribery in business cultures of developing countries, there are established organizations that aim to stop unethical business dealings. One of the most well known of these agencies is the Organization for Economic Cooperation and Development (OECD). OECD's Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, commonly called the OECD Anti-Bribery Convention (the Convention), is a primary reference for the fight against international bribery. The Convention "establishes

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[123] U.S. Department of Commerce, "Doing Business in Brazil: A Country Commercial Guide for US Businesses," *U.S. Commercial Service*, 2007.

[124] Ibid.

legally binding standards to criminalize bribery of foreign public officials in international business transactions and provides for a host of related measures that make this effective."[125] Brazil is a member country, but 73% of Latin American senior business executives participating in the survey reported that they where "not at all" familiar with the Convention.[126]

Another survey result was of particular relevance to Ford as it grows its new mobility business around the world: senior executives across the world reported that public works contracts and construction were the sectors most likely to find bribe payments to public officials. [127]

Attitudes Towards Rules

Geert Hofstede's analysis of Brazilian culture reveals some characteristic common among former dictatorships. Brazil scores high on "uncertainty avoidance," which "indicates a high concern for rules, regulations, controls and issues with career security."[128] Hofstede finds that as a society, they are risk averse and do not readily accept change. Furthermore, the Brazilian society has a low level of tolerance for uncertainty. Hofstede writes "in an effort to minimize or reduce this level of uncertainty, strict rules, laws, policies, and regulations are adopted and implemented."[129]

Hofstede also found that Brazil, like almost all of the Latin American countries, is a collectivist society (as opposed to individualist). Culturally, Brazilians have close, long-term commitments to member groups, such as a family, extended family or extended relationship. "Loyalty in a collectivist culture is paramount, and over-rides most other

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[125] Organization for Economic Cooperation and Development "OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions,"

http://www.oecd.org/document/21/0,3343,en_2649_34859_2017813_1_1_1_1,00.html

[126] See note 43 above.

[127] See note 43 above.

[128] Geert Hofstede, "Geert Hofstede Cultural Dimenstions: Brazil." *Item International.* http://www.geert-hofstede.com/hofstede_brazil.shtml

[129] Ibid.

societal rules." This is interesting to note because, as discussed in the preceding chapter, in terms of political parties, it is very common for politicians to switch parties. Perhaps this culture of loyalty that Hofstede finds applies to more familial, community relationships rather than political relationships.

Gender Roles

Like most Latin American countries, Brazil has a culture of machismo, which is defined loosely as the cultural expectation of male dominance in social relationships and "exaggerated manliness."[130] This corresponds with the traditional notion of women's role—called the "modelo de Maria" in Brazil—as "sacrificing, submissive to her man, and a "good" mother and wife."[131] Machismo refers also to physical aggressiveness as well as verbal aloofness. On the other hand, some scholars have pointed out the positive elements of machismo culture, such as its "emphasis on a noble education, self-confidence, nurturance, and dedication to the protection of the family" and that it "invokes notions of honor, responsibility, and protection of individuals weaker than oneself." Furthermore, many cite research showing that decision-making in the home is actually likely to be egalitarian rather than male-dominated, as might be expected; hence, DeSouza concludes, "the traditional notion of machismo in Latin American cultures is a stereotypic myth." [132]

Despite Brazil's patriarchal society, one study of São Paulo favelas found that women take the lead role "in issues related to neighborhood management and are responsible for dealing with refuse disposal, the lack of security in the streets, and other problems in the community."[133] While the majority of men leave the favelas early in the morning for work and return home late, the women deal with the neighborhood issues. As is such, women

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[130] Eros R. DeSouza, et al, "A Latin American Perspective on the Study of Gender," in *Praeger Guide to the Psychology of Gender,* ed. Michele A. Paludi (Santa Barbara: Greenwood Publishing Group, 2004), 42.

[131] Ibid., 41.

[132] Ibid., 44.

[133] Imparato, *Slum Upgrading and Participation,* 337.

are more often leaders in the neighborhood associations than men.

A study on the evolution of mobility in São Paulo found that between 1977 and 1997 the role of women changed significantly—greatly increased education levels, lowered fertility, and growth in the participation in the labor force.[134] The latter characteristic is significant to observe as more women in the labor force means additional mobility needs as they leave home each day for their jobs.

Favela Culture

While the above section provides insight to the whole of Brazil, special consideration must be given to the social situation within the favela as they will form an important market sector of the urban mobility network. The following section will provide valuable knowledge on the social, demographic, and cultural characteristics of the people of São Paulo's favelas.

Current and changing characteristics

As mentioned previously, in 2003 the 1.9-million favela dwellers represented approximately 20% of the São Paulo metropolitan population. Favela dwellers are almost equally divided between men and women, with slightly more women. Most heads of the family are men (78%). The population is quite young, with 63% under the age of 30 as of this year.[135]

While not the case for all favelas in São Paulo, many have experienced significant improvements and rising average incomes with the uptick in the Brazilian economy in recent years. As is such, the people beginning to rise above the poorest socioeconomic brackets are becoming "middle class." In 2007, an article featured in *The Economist* argued that the middle class that is now emerging in Brazil "is more accurately described

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[134] Strambi, "Untangling Factors Behind Temporal Evolution of Mobility," 143

[135] See note 4 above.

as a lower-middle class," and "is very different from the middle class of the past."[136] This new class is related more to the market than the state, meaning that the dictatorial ways of the past are fading as a new group of people rises into the mainstream. "The old middle class believed in state protection. The new middle class is more self-reliant."[137] Evidence of this is in the bustling markets and shops that this class of people helps drive, as well as in the numerous informal businesses that people use to bring themselves out of poverty instead of relying on social programs.[138] Another prime example of this emerging characteristic is the poor's rapid adoption of technology, which has been market-driven, with little or no connection to government policies.

Another important characteristic is that of the perception of and orientation towards time. Peter Jacobi found in his study of São Paulo favelas that the people tended to be present oriented, rather than a future or past oriented like wealthier classes. This indicates that the people of favelas will likely be most concerned with "what most directly affects the daily management of the household"[139] more so than with future needs or plans.

Community characteristics—The common perception of slums as miserable places to live does not always ring true in the case of the Brazilian favelas. In fact, many of the favelas have vibrant, close-knit communities—Paraisopolis "bustles with shops and lunch counters,"[140] and teenagers working at Ford explain that they like their favela homes because they "know everyone and [they] are comfortable."[141]

Perhaps this sense of community is a result of the long history of the favelas. Since at

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[136] "Adios to Poverty, hola to consumption." *The Economist,* 384 no. 8542. August 2007.

[137] Ibid.

[138] Ibid.

[139] Pedro R. Jacobi, "Environment in the city of Sao Paulo; problems, perception, and solutions," *Environment and Urbanization* 6, no. 87 (1994)

[140] Jennifer Rich, "Brazilian Slums Prove Location Reigns Supreme in Real Estate," *New York Times,* International Dec 2, 2001.

[141] Interview at Ford Motor Company, São Paulo. Interview by Alexandra Wilson, Emily Plews, and Luke Barber. 17 October, 2008.

least the 1970's, the people of the favelas have had to fend for themselves with out much help from the government.[142] Arias writes that "state intervention, for the most part, has been limited to policing, repression, and clientelist vote seeking."[143] Likely, these sporadic actions, or lack of actions, have left a sour taste in the mouths of favela residents, leaving them asking, "Who can they count on but themselves?" Thus, a strong sense of solidarity has been created through years of struggling to obtain basic urban services and through the many battles against eviction.[144]

This nature of the common favela history has taught the population to fend for themselves. In obtaining, or trying to obtain, necessary services, the favelas have devised numbers of strategies such as attaching to political elites or organizing popular protest. At the center of these organized strategies are neighborhood associations, which will be discussed later in the chapter.[145]

Beyond the strong social bonds, the favelas are physically aged, and the people of Pantanal and other favelas have become tied to their homes and their neighborhood. This sense of ownership and history can produce a rich culture. "Families generally invest more in building and maintaining their shacks [than in corticos], making moving less desirable." [146]

As will be discussed later, self-reference to the favelas can be positive as well as negative. "It is generally positive in the sense of belonging to a "community," which has its meeting points, parties and friendships. It is negative when referring to violence… and the

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[142] Robert Gay, *Popular organization and democracy in Rio de Janeiro: a tale of two favelas* (Philadelphia: Temple University Press, 1994)

[143] Enrique D. Arias, "Faith in Our Neighbors: Networks and Social Order in Three Brazilian Favelas," *Latin American Politics and Society* 46, no.1 (2004):2

[144] Janice E. Perlman, "Metamorphosis of Marginality: Four Generations in the Favelas of Rio de Janeiro." *Annals of the American Academy of Political and Social Science* 606, no.154 (2006):159

[145] See note 142 above.

[146] See note 4 above.

precariousness of housing."[147]

Jobs and income—In general, the people of the favelas will leave the neighborhood for their work in often temporary, low-skilled jobs as construction workers, security guards, and housekeepers, for example. As most of the favelas are outside the city center, commutes to the workplace are usually quite long—the bus being the most common method of transportation.[148] However, with larger businesses beginning to move into the larger, more established favelas, more people are able to work within their neighborhood. In Paraisopolis, for example, "businesses within the community employ about 40% of all heads of households."[149] People will sometimes move to one of the few more centrally located favelas—like Paraisopolis—from better living conditions simply to save on transportation costs for the work commute. Clearly, there is a need for jobs that are located within favela neighborhoods as well as better, more efficient transportation options for those unable to work near home.

The minimum wage in Brazil is a remarkably low $202 a month, or $2,424 a year,[150] with income lower in families headed by women.[151] With an income this low, even public transportation can become unaffordable. However, the poorest of the poor are decreasing in total number, and those earning more than minimum wage has been growing: "In Brazil between 2000 and 2005 the number of households with an annual income of 5,900 to 22,000 USD grew by half, from 14.5 million to 22.3 million."[152]

Education and literacy—Although Brazil's total adult literacy was 89% in the years between 2000 and 2005, literacy in the favelas is much lower—especially in the smaller, more isolated favelas like Santa Isabela. The majority of the adults in the favelas left

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[147] See note 4 above.

[148] See note 141 above.

[149] See note 140 above.

[150] Gerald Jeffris, "UPDATE: Brazil Hopes $15.2B Housing Plan to Check Econ Woes," *Wall Street Journal*, March 25, 2009

[151] See note 4 above.

[152] See note 136 above.

school well before completing primary school and "only a small percentage complete secondary or enrolled in higher education."[153] However, with favela urbanization, as is done by the CDHU, educational opportunities for adults and children alike increase significantly.

The new middle class—those people that might be found in the larger, older, and improved favela neighborhoods—have more education than their parents. Some have gone to the private universities that have increased rapidly in number in recent years. Even still, "they are less educated than the old middle class that benefited from elitist public universities—and that makes moving into the upper class hard."[154]

Interestingly, high cell phone and computer usage among the poor and the newest generation might translate to a new kind of literacy that revolves around things like text messages.[155]

Status and Attitudes

"Favelas"—A stigma surrounds the people living in favelas. While many don't wish to leave their homes, they would like to change the perception of their homes and neighborhoods. As we spoke to teenagers who lived in the favelas, we observed that only one ever used the word "favela." Those who live in favelas "suffer all kinds of prejudice."[156] To get work, they "almost always hide their condition giving as their own the address of relatives or people they know."[157] Elisabete Franca, the head of São Paulo's low-income housing unit, explained, "It's offensive to call somebody a favelado (slum dweller) for the rest of his life"[158]—"favelado" being a pejorative term referring to

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[153] See note 142 above.

[154] See note 136 above.

[155] Kate Baggott, "Literacy and Text Messaging: How will the next generation read and write?" *MIT Technology Review*, Dec 21, 2006, http://www.technologyreview.com/biztech/17927/?a=f

[156] See note 4 above.

[157] See note 4 above.

[158] Terry Wade, "Favelas no more? Some Brazilian slums mature." *Reuters*, Dec 11, 2006, http://www.alertnet.org/thenews/newsdesk/N28448487.htm

the people living in favelas.[159] The name carries such weight that the city authorities in São Paulo "plan to start calling dozens of shanty towns with basic infrastructure and sturdy houses "nucleos urbanos" rather than favelas," hopefully changing the way favela residents are perceived.

Even though there exists a powerful stigma, we found that in fact the citizens of Pantanal and other favelas rarely voiced any desire to leave the favela. They remarked that they felt safe there, they were comfortable, and had all of their friends and family there. With basic infrastructure making its way into more and more favelas, they transform into something new, something well deserving of a new name. Many become tight-knit, dynamic communities.[160]

Consumption—As is common in most developing countries because of the general lack of personal and financial stability, Brazil is still a highly materialist country;[161] MIT scholar Tim Kasser finds that "enhanced desires or "needs" to have more or consume more are deeply and dynamically connected with feelings of personal insecurity."[162] With insecure living situations and an inability to afford or secure the necessary credit for large purchases such as a house, the people of the favelas take solace and pride in smaller, more attainable items. A representative from a furniture chain interested in bringing a store to a favela said simply, "these people are big spenders."[163] As was observed in Heliopolis, one of the oldest and largest favelas in São Paulo, "favelas are full of cars, televisions, satellite dishes and furniture stores."[164]

A study by *The Economist* showed that consumption by the poor is quite high and

[159] Andrea Medrado, "Community media: important but imperfect. A case study of a community television station in a Brazilian favela," *The Research and Teaching Communication Series* (Tartu University Press: 2007)

[160] See note 158 above.

[162] Tim Kasser, *The High Price of Materialism* (Cambridge: MIT Press, 2003)

[163] Jonathon Wheatley, "Popular retailer moves into Brazilian favela," *Financial Times*, Nov 13, 2008, http://www.ft.com/cms/s/0/58425fc0-b1cd-11dd-b97a-0000779fd18c.html?nclick_check=1

[164] See note 158 above.

growing. For example, the sales of computers, cars, and consumer electronics are at record levels in Brazil. The São Paulo McKinsey office found that "social classes D to B2 (annual incomes from 3,000-22,000) were responsible fro 69% of total consumption in Brazil in 2005, up from 51%" in 1995. [165]

Technology—In Santa Isabela, a small and very poor favela, a group of adolescent boys crowd around me, asking excitedly about the small video camera I had in my hand and ignoring me when I tried to tell them my name or ask them questions. The group of teenagers we interview at the Ford plant explain that they all have cell phones as well as daily access to the internet, if not at their own homes in the favelas. These are some of our personal observations of the very high acceptance of technology among not only the young but also the poor in São Paulo.

According to Vodafone, a successful cell phone carrier in Brazil, the current penetration rate of cell phones in Brazil is 63%. What's more interesting is that as of December 2007, 80% of cell phones in Brazil were pre-paid.[166] With pre-paid cell phones, users do not have to worry about paying a monthly bill—an encouraging set-up for those in the favelas. Furthermore, even when no credit is left on a pre-paid phone, the user can still receive phone calls and text messages at no cost.

Cell phones are considered a necessity among the favela residents—as they promote safety and security—not status symbols. However, cell phones in favelas are generally used just for the basics because the added features such as video and internet accessibility are deemed too expensive.[167]

As we saw in the homes of the very poor Santa Isabela residents, televisions are

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[165] See note 136 above.

[166] Corrine Ramey, "From Favelas to Townships: Mobile Use in Low-Income Populations," *MobileActive.org*, http://mobileactive.org/favelas-townships-mobile-use-low-income-populations

[167] Adriana de Souza e Silva, "Cell phone use among low-income communities—an initial study of technology appropriation in the favelas of Brazil." *Receiver Magazine*, http://www.receiver.vodafone.com/cell-phone-use-among-low-income-communities

extremely common. One study found that televisions were found more often than refrigerators. As might be expected, the people watch their televisions quite a bit—most children watch the television for longer than three hours each day.[168]

It is important to note that while televisions are ubiquitous in the favelas, radio "is still one of the most popular means of mass communication in Brazil."[169]

Social Structure and Organization

Neighborhood associations—One form of favela self-governance is the neighborhood association. Neighborhood associations have a long history and have existed both corruptly as well as honestly. In the earlier days of favela living, neighborhood associations developed as a way to protect the favelas from removal. Still today, local leadership plays an important role in the internal governance of the favelas. In Pantanal, part of the role of CDHU was to establish representatives for each block of houses. This enabled the CDHU to better understand the needs and concerns of the citizens and to do so at a reasonably sized level. This also gave the citizens a voice that they knew carried weight with the CDHU. Even without the CDHU-established governance system, the residents of the favelas often have strong social bonds and a feeling of community.[170] It is important to note that the favelas that have more private lots were found to have fewer community organizations and weaker social ties.[171]

PCC/drug lords—The common perception of favela governance is that they are controlled by drug-traffickers. While this is certainly not true for all favelas in São Paulo, it is true for some. A scholar of Brazilian favelas concluded that the power of the drug-traffickers is a result of government corruption—corruption has resulted in poor

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[168] João G. B. Alves, at al., "Overweight and physical inactivity in children living in favelas in the metropolitan region of Recife, Brazil," *Jornal de Pediatria* 85, no.1 (2009)

[169] Cherise Fong, "São Paulo radio station teaches old media new tricks," *CNN.com,* March 26, 2009 http://edition.cnn.com/2009/TECH/03/25/digitalbiz.radarcultura/ (Accessed March 27, 2009)

[170] See note 144 above.

[171] See note 144 above.

administration and deployment of resources, therefore strengthening the power and status of the drug-traffickers.[172] In many communities, the drug-traffickers have historically kept the people happy by putting on parties for children or for having basic needs provided, like having water piped in.

Safety and Crime

It is common among favela residents to have a negative image of the police. The police, mostly the civil police, have a history of corruption and illegal relationships with drug dealers, often resulting in police brutality. Many scholars have written about the privatization of public security—Arias writes, "the poor, unable to hire their own security guards, have to rely on criminals for protection."[173] However, the vast improvement of some favelas has resulted in a significant decrease in crime—in Pantanal homicides went from approximately 20 per year in 2000 and 2001 to 0 per year by 2006. With this change in crime has come a changing perspective on crime and safety in the neighborhood. Moreover, the favelas that are older and more established, with or without government intervention from the CDHU, "tend to suffer less violence." [174]

Interestingly, cell phones are seen as a way to ensure greater safety for those living in favelas. If conflict arises, cell phone users are able to call and alert one another to danger in the favela. Another example of cell phones providing greater safety is the ability to coordinate meeting times or ride pick-ups much more accurately, reducing a person's alone time vulnerability.[175]

The privatization of security, as mentioned, can come in the form of markups in rents, as has been studied in Rio de Janiero—"self-designated neighborhood police forces that run the favelas with an iron heel and a hand in everyone's pocket." This trend of privatized

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[172] See note 143 above.

[173] See note 143 above.

[174] See note 158 above.

[175] See note 167 above.

security has, as journalist Mac Mergolis observed, been driven by "a complex demographic upheaval of rising prosperity in the emerging nations, a widening gap between rich and poor, burgeoning slums, and the incapacity of official enforcers to keep pace with outlaws." [176]

In São Paulo, when violence and other illegal activities by the drug-traffickers get out of hand, the police have performed what is called "Operation Saturation." Operation Saturation "aims to combat drug trafficking, robberies, thefts and to prevent other crimes." During the operation, the favela is flooded with troops to stabilize and control, resulting in a dramatic (40%) decline in crime.[177] The most recent occurrence of violence necessitating "Operation Saturation" was in September of 2008, which endured for 99 days.

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[176] Mac Margolic, "The Gangs of Rio," *Newsweek*, Feb 23, 2009, http://www.newsweek.com/id/185499

[177] "PM to make delivery during the 11th Operation Saturation in capital," *Portal do Governo do Estado de Sao Paulo*, Oct 14, 2008 http://www.saopaulo.sp.gov.br/sis/lenoticia.php?id=99597

FAVELA INFRASTRUCTURE

As is certain, conducting business in slums will require a significant shift in strategy to fit the needs and requirements of what is an incredibly new market for businesses such as Ford. Especially in slums, market demands will be greatly influenced by the scarcity or abundance of resources that many current American business plans assume to be plentiful such as adequate roads and sanitation. Business will thus be limited, but also potentially encouraged, by the significant challenges in infrastructure present in slums.

Slums are often defined economically or even socially as places with a high population density and extremely low average wealth. Slums tend to be created in marginal lands and are often extremely dynamic, changing both quickly and often. Due to the economic limitations of residents, slum investment from within is extremely difficult and is very rarely communal. The end is result is an incredible lack of infrastructure servicing what can become an extremely large, dense population.

Even within the same city, slums are typically very diverse, as the limiting resources in each area may be different. Within a small geographic area, one slum may be limited infrastructurally in two or three completely different ways than another. One slum may have electricity and no roads, and another may have the opposite. While slums are obviously diverse, certain categories of limitation are common. Resource scarcity in a slum or favela can be caused by the lack of one or more of the following: nutrition, water, housing, electricity, technology, and mobility.

Challenges to business abound in such resource scarce markets; however, for-profit opportunities that could potentially ameliorate a slum's economic, social, and infrastructural problems can be created as a direct or indirect goal. For every scarce resource, potential exists to alleviate the problem through well-crafted, careful business or government practices. Certainly, challenges will be faced, and maintaining equity in such plans is both absolutely vital and absolutely difficult.

Resource Scarcity in São Paulo and in Pantanal

Information

Scarcity of information about slums is an important consideration not only for the residents of São Paulo's favelas, but also for corporations such as Ford that are seeking to gain market information before investment. In Brazil, and particularly São Paulo, favela dwellers are sometimes ignored members of the population. Little useful information is gathered about the people in slums simply because, in large part, favelas are quickly changing, and they may not the major concern of the government.

When information does exist about poverty, often through the work of the United Nations Development Program (UNDP), the information is typically an aggregate for the entire country. Brazil's diversity is famous, and such aggregations of information leave much to be desired. Especially in regard to poverty, aggregated information is useful but limiting due to the blending of information about the poor in cities (favelas) and the poor in rural and forest areas such as the Amazon.

Teasing these numbers apart, however, is sometimes an impossible task. Favelas are remarkably dynamic, and tracking the movement of people and their well-being would be an enormous undertaking even for a government interested and invested in the welfare of its poorest members. The Brazilian government, however, can't fairly be described in such a way, despite the wide variety of social programs funded by the government, including CDHU.

This lack of available numerical data means that the balance must be made through other forms of information – namely, first-person contact. Much of the infrastructural information below is anecdotal. While some infrastructural information does exist for favelas, favelas are incredibly diverse and constantly changing. Numerical data is outdated nearly instantaneously for many areas.

For this reason, creating a viable, consistent network of invested individuals in Ford's planned work area is critical. Gathering information cannot be done easily through the internet or even over the phone in some areas. Instead, open one-on-one communication is a must.

Nutrition

Food has become a difficult consideration in many of the favelas in São Paulo. The United Nations Development Program states that about 7% of Brazil is undernourished. While this represents a 5% reduction since 1992, the proportion is still much too high.[178] While certainly a large proportion of this statistic is due to populations in the Amazon, the issue cannot be ignored in favelas, which are without doubt areas of high incidence of undernourishment. Compared to many areas of the world, food is plentiful; however, nutrition issues still abound. For this reason, undernourishment can more easily be attributed to issues of accessibility and education.

Slums that are characterized by limited mobility often have extremely high prices on staples needed to provide proper nutrition. The response to this problem in many slums is the creation of small markets operated by those few who can access the food network of São Paulo. While active small business is a benefit to a favela, many of these stores charge exorbitant prices for their goods.[179] Across São Paulo, as well as many other areas worldwide, the solution has been to eat packaged, cheap, and easily acquired food with very little nutritional value.[180]

In this way, a problem of mobility has produced a problem of nutrition in an area where nutrition could be much more easily guaranteed. In addition, malnutrition in São Paulo's slums can also be attributed in part to a lack of proper education. Studies have shown that

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[178] "2007/2008 Human Development Report," The United Nations Development Program. http://hdrstats.undp.org/countries/data_sheets/cty_ds_BRA.html

[179] Sergio Pacca, Professor at the University of São Paulo, interview by Alexandra Wilson, Emily Plews, and Luke Barber, October, 17, 2008.

[180] See note 106 above.

a poor understanding of nutrition among the poor greatly exacerbates the problem, causing nutrition issues even in areas with an adequate supply of food. [181] Of course, increasing understanding and demand for healthier food options in an environment lacking those factors cannot lead to success. Certainly, the issue is a systems problem with no single answer.

A common, silver bullet solution throughout the world and in São Paolo has been the donation of foodstuffs to families in need. John Sooter, of the Family Care Foundation, anecdotally cites the difficulty of giving aid to families in slums. His foundation works in Santa Isabela, a much smaller, more geographically distant favela of São Paulo.

In Santa Isabela, the local factory owner recognized the plight of the favela dwellers and created a program to pay some of the wages of its workers through discounted meal vouchers. The (all male) employees clamored happily for these vouchers, which they promptly traded with each other for alcohol. The factory owner tried another approach - give the employees food boxes directly. The scheme seemed to be working until he happened to stop at the local bar after work only to find a back storage room filled with meal boxes that had been again bartered for alcohol. Now, the owner of the factory has each food box delivered to the wives and mothers of the favela in order to ensure that they are being eaten.[182] As can be seen, the problem of nutrition in many instances is not truly scarcity of the resource (though it can be), but scarcity in education regarding it and, sadly, apathy.

As can be seen, the problem of nutrition in São Paulo favelas can be best solved via increased accessibility and improved education. Simply providing food to these slums, free or cheap, is not a viable solution and should be avoided; however, even small mechanisms to allow a freer exchange of goods in favelas would provide a disproportionately large benefit to favela nutrition, especially when coupled with improved health education.

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[181] Maria Carmen Bisi Molina et. al., "Nutritional Status of Urban Low-Income Communities, Brazil," *Journal of Public Health* 23 (1989): 2.

[182] John Sooter.

Case Study Pantanal—In Pantanal, accessibility to exterior food sources is extremely low; however, the relatively large size of the population as well as the presence of CDHU means that food deliveries are a priority. In addition, programs to produce small-scale agriculture on the marginal flood plain land left vacant by moving citizens into housing complexes is in the works.[183] In the foreseeable future, Pantanal may be producing some of its own fruits and vegetables.

Water and Sanitation

Across the world, access to clean drinking water is one of the biggest current focal issues and the trend seems to be worsening. In Brazil, however, the issue is not as extreme. As of 2004, 90% of all Brazilians were regularly using improved water sources. Unfortunately, these numbers are again difficult to pinpoint specific to slums, but in urban areas, however, about 96% of residents have access to clean water, including favela dwellers.[184]

Unfortunately, sanitation is a much more critical issue. As of 2004, 25% of the population of Brazil lacked access to improved sanitation systems.[185] In the slums, the problem was immediately apparent. While slums such as Pantanal have been part of government intervention for a number of years, many more slums go ignored. In urban areas, only 83% of residents have access to improved sanitation, and only 53% have available sewers.[186] The result is the aforementioned pollution of the water systems.

Case Study Pantanal—While Pantanal is under very active upgrading programs through CDHU, with specific projects relating to sanitation, water accessibility, and drainage, São Paulo's water system as a whole leaves much to be desired for the poor. For example, Pantanal is bordered on one side by the Tiete River, which averages 40 square

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[183] Interview with CDHU staff, Vila Jacui, Sao Paulo. Alexandra Wilson, Emily Plews, and Luke Barber. October 21, 2008.

[184] "2007/2008 Human Development Report."

[185] "Coverage Estimates: Sanitation," *WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation*, June, 2006.

[186] Ibid.

meters per second of discharge of effluent and industrial waste.[187] The water is brackish and almost entirely devoid of oxygen, and the São Paulo state government estimates that an investment of R$3 billion would be necessary to adequately clean just that single river.[188] Practically speaking, the river is simply an open sewer leading, unprocessed, to the ocean. While the citizens may not use this water directly, flooding is a danger, and such close proximity to such a polluted river could encourage other health issues.

In Santa Isabela, the slum had only recently gotten an imperfect and incomplete sanitation system. *(See Image 10 below)* The problem is aggravated by the climate and the yearly intense rains that can raise water levels and spread waste from ditches into homes and roadways. Before the improvements of Santa Isabela, one story tells of a pregnant woman who fell in the street after such a rain, got an infection, and lost her unborn child.[189] Certainly, the concerns of sanitation are great.

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[187] Basil Van Horen, "Developing Community-based Watershed Management in Greater São Paulo: the Case of Santo Andre," *Environment and Urbanization* 13 (2001), 210.

[188] Ibid.

[189] See note 106 above.

Image 10: New section of sewer line in the Santa Isabela favela. (Photo: Wilson)

Unfortunately, improving sanitation systems is economically burdensome and, in some instances, impractical. One of the inherent features of slums in São Paulo is their dynamic nature. In a matter of days, a favela can be constructed or abandoned, and building capital intensive sanitation systems is often beyond the means of the municipality.

In other instances, an imperfect compromise is reached in which sanitation systems are built draining into one of the two major rivers of São Paulo. The result is a river running black and green through the city. In addition, many favelas are located on the marginal land in the flood plain of these rivers, prime targets for flooding and resulting sanitation issues.

The residents of Pantanal do not use the water of the Tiete for obvious reasons, but the water supply system for Greater São Paulo, which is used by Pantanal, is in poor condition. São Paulo's water supply is provided largely by water basins to the north and south of the city. Two of these reservoirs, the Billings and the Guarapiringa provide roughly 40% of São Paulo's water supply. Growth in the last two decades, however, has surrounded these reservoirs with dense populations without basic services. These newer favelas are releasing solid waste and waste water directly into these reservoirs at alarming rates.[190]

The effects of such poor sanitation are readily apparent throughout the city, which was jokingly described during our trip as "a never-ending smell buffet with nothing you wanted on the menu." Certainly, great improvements need to be made immediately.

Housing

One of the most significant problems in São Paulo is a lack of appropriate housing for its citizens. While São Paulo is one of the richest and most important cities in South America, slums grow and decline even in the center of the city on a weekly basis. Some slums, such as Heliopolis and Paraisopolis, have tens of thousands of residents, and others have only a handful nestled in scrap wood under a bridge embankment. This variability of the issue makes approaching the problem much more difficult. Due to its rapid changing nature, it's difficult even to know where all the slums are, let alone ameliorate and improve conditions in them.

While slum formation is often accredited to rapid population growth, the whole of São Paulo has not experienced tremendous growth in the last decade. In recent years, however, many scholars have begun to dissect the real estate market as the true producer of slums, especially in areas where population growth is not extreme and slum upgrading programs are improving living conditions.

Unfortunately, a potential negative exists for these programs. According to some

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[190] See note 187 above.

evidence, slum upgrading programs have the potential to increase the likelihood of slum growth. In Brazil, real estate law requires a minimum footprint for a parcel of land. In an effort to increase land ownership in informal housing settlements, some cities have reduced these minimum parcel sizes. Laws such as these have the potential to quickly alter land values for surrounding areas, especially in places such as São Paulo where informal settlements can be found next to extremely expensive real estate. In addition, decreasing lot size has the intended consequence of increasing inexpensive housing supply. In many cases, however, an increase in housing supply leads to an increase in the growth rate of the city and thus exacerbates the problem of favelas.[191]

Case Study Pantanal—Organizations such as CDHU lead incredibly informed, skilled upgrading campaigns in places like Pantanal. Some housing had to be cleared due to the high likelihood of flooding, but for the people of this part of the slum, replacement housing was built. The now fallow land will most likely be used for small-scale agriculture for the residents. Additionally, CDHU is constructing a large, central park with access available to the entire slum. Again, houses had to be cleared for this project, but those residents were provided with high-quality alternative housing. In addition, residents were given the option of the state provided housing or another house in the favela from someone who preferred the tenement. In this way, a sense of ownership in the favela is fostered, and the amenities provided by CDHU are much less likely to be abused.[192]

Certainly, in Pantanal, it is easy to imagine a scenario in which infrastructural improvements will lead to an increased demand for inexpensive and informal housing in the favela. While open areas such as the parks and the flood plains are currently monitored to keep housing from being constructed, access to infrastructure and the possibility of inexpensive improved housing could potentially increase migration to

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[191] Somik V. Lall, Hyoung Gun Wang, Daniel Da Mata, "Do Urban Land Regulations Influence Slum Formation? Evidence from Brazilian Cities," Unpublished document written for the World Bank Knowledge for Change Grant *Dynamics of Slum Formation and Strategies to Improve Lives of Slum Dwellers*, 2007.

[192] See note 183 above.

Pantanal.

Electricity

In São Paulo, information regarding electricity production and distribution is not nearly as readily available as in the United States. Certainly, the statistics exist, and the providers monitor production, distribution, and use, but sharing that information is much less frequent. In fact, the São Paulo Secretary of Sanitation and Energy provides useful statistical information only for gross production and distribution. This trend is likely caused by the variety of electrical providers, such as Duke Energy, that may be less likely to share business information. In the state of São Paulo, electricity is generated by five different companies – Duke Energy, CESP (Companhia Energetica de São Paulo), AES Tiete, CPFL (Companhia Paulista de Forca e Luz), and AMAE (Empresa Metropolitana de Aguas e Energia).[193]

The state government of São Paulo does, however, recognize the difficulties in providing electricity for all of its inhabitants through its "Luz para Todos" (Light for All) campaign. This program, however, seeks only to alleviate energy availability in rural areas of the state.[194] While Pantanal has available, legal access to electricity, favelas such as Santa Isabela do not.

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[193] "Electric Energy," *Secretary of Sanitation and Energy, São Paulo State Government*, http://www.saneamento.sp.gov.br/

[194] Ibid.

Image 11: A typical electrical connection in Santa Isabela. (Photo: Barber)

As is obvious, the need for upgrading less developed slums is great simply from a safety standpoint. Anecdotally, John Sooter described witnessing what is for the residents of slums such as Santa Isabela a normal occurrence—a resident in need of an electrical hookup finds enough wiring to reach their house, strips a large section of one end, wraps a portion of that end around a rock or other weighted object, and throws the contraption directly onto the nearest power line.[195] The illegal and unmonitored theft of electricity such as what is shown in Image 1 is potentially enormous. São Paulo's electricity providers should have a vested interest in electrifying communities such as Santa Isabela simply to have better information about electrical loading and demand.

Technology

Access to technology is one of the least limited infrastructural resources in the favelas of São Paulo. Technology is expensive but simultaneously increasingly important, and the ability to leapfrog technologies in such areas is enormous. For this reason, new and old technologies are often juxtaposed in the favelas.

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[195] See note 106 above.

Two technologies have almost complete ubiquity in the favelas of São Paulo (as well as in slums around the world)—television and cellular phones. Even in slums such as Santa Isabela, each shack had a television, and it was almost always turned on. Satellite dishes covered the rooftops of the buildings with permanent roofs. Often, these dishes were directly beside scrap corrugated aluminum roofs, demonstrating the coexistence of very different levels of technology and development.[196] Certainly, television has important effects on the social and psychological perspectives for those living in slums.

The second ubiquitous technology is the cell phone. These cell phones represent a major opportunity for formal businesses in favelas. Cell phones can be used to pay bills, communicate individually or in groups through text messages, and the minutes can be used as currency. In this way, formal economies have a foothold in such places like no time in the past.

Internet, while not yet as ubiquitous as cellular phones or television is becoming increasingly important for communication, education, and leisure. While places such as Santa Isabela lack internet accessibility, many other favelas have methods of getting online, often through schools. In an interview with young paulistanos at the Ford Motor Company, most of whom were from favelas, every person agreed that they have internet access daily, and some were able to get online at home in the favelas.[197]

Additionally, connectivity is growing quickly in Brazil. In Rio de Janeiro, a program called Orla Digital is currently erecting high-speed wireless antennas in the Dona Marta favela. The project will provide 10,000 homes with free wireless. As of yet, the largest problem with the program is providing enough bandwidth to meet the demand of the residents.[198]

> *Case Study Pantanal*—In Pantanal, the state of technology is good. Schools are

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[196] Ibid.

[197] See note 141 above.

[198] Julie Schwietert, "Brazilian Favela Gets Wired," *Matador Pulse*, February 21, 2009, http://matadorpulse.com/brazilian-favela-gets-wired/

wired, and residents have access to these amenities. As is the case everywhere, the residents have cell phones and televisions and use both frequently. The opportunity for technological growth, however, is great. Especially through improvements in the capabilities of cellular phones, residents of places with relatively good technology can improve their access. While many favela residents do have computers, many do not. Certainly, cell phones with internet capabilities would be much less expensive than purchasing a computer and would still allow access to important functions such as email and transit information. In addition, Pantanal, while having more than 8,000 families, has not a single bank. Online banking and bill pay are potential economic giants for favela residents who can get online regularly even if only on the small screen of a cell phone.

Mobility

Mobility is possibly the most variable limited resource for slum residents in São Paulo. Some smaller slums are central to the city center and thus have physical access to the same infrastructure as the wealthier members of the city, though these smaller favelas are much less likely to have direct service. Unfortunately, there still exists a significant barrier to mobility through cost. For instance, many favela residents who have lived in the city even for a long time have never used the subway system due to expense.[199] For those residents who do have the means to access public transportation networks, accessibility is relatively good. Whether the residents use this connected public transit system, however, is another important issue.

Even for non-Portuguese speakers, using the subway system was relatively easy, taxi drivers were typically helpful, and the train, although typically congested, is convenient. Automobiles, however, are without a doubt the most popular method of transportation for relatively few who can afford them despite the ease of using the public transit system. Fuel is inexpensive, and cars are seen as important status symbols. While many lack the means to purchase a car, congestion in the city is certainly the most significant

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[199] See note 141 above.

transportation problem for the city as a whole both as a social and environmental problem.

Trips by car are notoriously difficult, unsafe, and stressful, but despite the difficulties, over 1,000 new cars arrive in São Paulo every day.[200] During peak congestion times, what is typically a twenty minute ride can take hours. As many residents cite, sitting in traffic is simply unsafe as marauders can easily approach a gridlocked car, break the window, and demand wallets, jewelry, and valuables. Many car owners specifically cite feelings of being unsafe in cars and many women put their purses under their seats in the hopes of curbing potential thieves.[201] In addition, the particulates emitted by these ethanol and gasoline guzzling cars are the cause of the major environmental problem of the city - the intense, omnipresent smog. Despite these problems, cars are seen as conveniences worthy of the difficulties in purchasing and maintaining them.

For many of the citizens of São Paulo, the public transit system is adequate for their daily lives. Indeed, for many, public transit is the only way to travel the city. São Paulo, however, is known for a lack of planning, forethought, and carry-through on many of its public transit programs. One exception may be São Paulo's extensive bus network. While even this system has had problems with governments beginning and suddenly canceling plans (most notably the elevated dedicated bus line that as of now basically runs nowhere), the city's bus system is the jewel of bus systems worldwide. About 20% of the city's 18 million use the bus system daily, and total ridership for the system is at around 10 million people. The system could support transporting the entire population of Belgium daily. Running more than 26,000 buses and almost 2,000 lines is no easy task, and the system is probably the most complex in the world.[202]

To add to the usability of the system, most of the city has dedicated bus lanes that are

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[200] Tom Phillips, "High Above São Paulo's Choked Streets, The Rich Cruise a New Highway," *The Guardian*, June 20, 2008.

[201] Moana Simas, interview by Alexandra Wilson, Emily Plews, and Luke Barber, October 21, 2008.

[202] Erico Guizzo, "How to Keep 18 Million People Moving," *IEEE Sprectrum*, June, 2007, http://www.spectrum.ieee.org/jun07/5139

packed with buses buzzing right past cars stuck in the bumper to bumper traffic that can make the city so difficult to travel. In fact, the bus lanes seem to have their own congestion problems as can be imagined when a city has as many buses running as São Paulo. Due to this congestion, and the number of stops in the average bus line, trips can be long.[203]

The complexity of the system, however, produces a very difficult organizational dilemma. While most cities have a pamphlet of the routes of one area, providing a complete guide for 2,000 bus lines would require multiple volumes. In addition, this guide would still only provide information for a single mode of public transit. Google is beginning to produce online maps and directions integrating São Paulo's transit system, but accessibility to this information, especially while traveling in the city, is low, especially for the city's poor. Opportunities to ameliorate these problems is great.

Companies such as Ford offer their own bus service for employees that will take residents of surrounding neighborhoods to and from work. According to those interviewed, these private bus lines provided much more convenient, fast transportation for a daily commute.[204] These lines, however, cannot be used for everyday travel to places such as the market. As useful as they are, they are extremely limited.

Case Study Pantanal—In Pantanal, the situation is particularly poignant. The favela, which has about 25,000 residents, is located between train tracks and one of the major rivers of the city. The slum is thus made into a peninsula with almost no accessibility to transportation. Even a trip to the nearby park, located geographically only a few hundred yards away, requires walking several miles to access a point where crossing the train tracks is possible. For the lucky few who own cars, there is only one entrance to the favela. This entrance is a one-way tunnel under the train tracks where congestion is an enormous problem.

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[203] Ibid.

[204] See note 141 above.

To add insult to injury, the train that creates such a wall to accessibility for Pantanal's residents completely circumvents the residents. *(See Image 12)* Residents who can afford a train ticket must travel miles to reach the nearest train station despite the fact that the tracks are clearly visible from nearly any point in Pantanal.

Image 12: A train passes by Pantanal, where they have no direct access to the line. (Photo: Barber)

Meaning for business

As can be seen, doing business in underdeveloped areas will demand a rapid evolution in business technique for any firm assuming ample infrastructural resources in the market. In fact, "evolution" is an excellent analogy for how companies such as Ford must undertake actions in slums worldwide.

In natural history, evolution is encouraged through resource scarcity. Populations have no impetus for change in unlimited environments, and in very limited environments, very rapid change is sometimes demanded for survival. Succeeding economically in slums, extremely limited environments, demands equal change, but instead of being driven by

chance and genetics, the change is driven by technique and savvy. Resource constrained environments both in business and ecology provide intense feedback that is vital to survival. Firms can use networks and stakeholder engagement to guide change. As in ecology, the resulting change may be extremely drastic, but successful businesses must be aware of this possibility.

Survival of the fittest, of course, remains for both sides of the analogy, and though resource scarce areas offer valuable opportunities for business due in large part to incredible demand, poorly planned or executed plans are much more likely to fail than their counterparts in wealthier areas. In short, business ventures in slums have much higher stakes and are extremely reliant on feedback and creatively designed business plans. Old modes of business simply will not function in the same way in a slum. Shipping via trucks doesn't work where there aren't paved roads, and marketing via text doesn't work where there is high illiteracy. Ability to change and business agility are absolutely necessary tools.

In conclusion, while infrastructure is obviously lacking in São Paulo's favelas, understanding that each favela is limited differently is vitally important in creating a business plan for those areas. Only through intense networking can a firm produce a viable strategy for these markets. In addition, this business plan should be capable of rapid evolution in order to keep pace with the rate of infrastructural change in favelas. Firms are seeking to hit a moving target, and getting feedback from stakeholders is the only way to monitor the infrastructural needs of the market.

THE INFORMAL ECONOMY

One of the greatest challenges facing an international corporation in conducting business in foreign slums is the separation between the formal economy and the informal economies prevalent in poor regions around the world. While large multinational corporations are bound by legal systems, bureaucracy, and currency, informal economies are not controlled by these measures. In fact, informal economies are marked by exceptional diversity, rapidity of change, and resilience. One must have a deeper understanding of the business climate within favelas - and how that climate must be understood from the vantage point of a U.S. multinational – as one assesses the feasibility of implementing New Mobility solutions in the favelas of São Paulo.

Strengths and Weaknesses of Brazil's Informal Economy

As Jaap Klaarenbeek cites, informal economies are marked by "unregistered jobs, no tax payments, little income certainty" and "unstable working conditions."[205] Many of these people live barely within the legal system, and have, as discussed, very little access to the amenities of other residents of São Paulo with perhaps the exception of the penal system - the drug trade, of course, is part of Brazil's informal, black market economy. While informal economies in São Paulo favelas have significant problems, certain benefits do exist. Without political barriers, those seeking to trade or begin a business can do so much more quickly and cheaply, although the legal risks of operating an informal business are significantly higher.

The capability to begin and continue a business below the radar of government is a particularly important ability for favela residents in Brazil. Opening a formal business takes, on average, 152 days in Brazil, about three times as long as the world average.[206] In

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[205] Jaap Klaarenbeek, "Informal Sao Paulo" (presented to City Space Investigators, Sao Paulo for the Parallel Worlds Lecture Series in Sao Paulo, Brazil, February 18, 2009), 16.

[206] Joe Capp, Heinz-Peter Elstrodt, and William Bebb Jones, Jr. "Reining in Brazil's Informal Economy." *McKinsey Quarterly* 1 (2005): 10-11.

addition, the heavy Brazilian taxation limits the profitability of any firm and reduces the likelihood of success of businesses that are generally only marginally profitable, such as the far majority of favela businesses, typically markets, food stands, and repair shops.[207]

It is important, however, to understand that informal favela businesses are enormously important economic engines in favelas. They are the canary in the coal mine of a favela's health. When these businesses fail (or fail to open), residents are forced to find employment as well as goods and services elsewhere. Unfortunately, it is inaccurate to purport that the majority of informal employment is being done inside favelas. In fact, the far majority of informal economic activity in favelas is in the form of formal businesses employing low-income slum residents, often under the table.[208] While employment is certainly a valuable asset for favelas, legal recognition of employment should be considered in the same way legal recognition of tenure and land ownership is - a necessary step toward social inclusion.

In sum, these two forms of informal economic activity, informal business and informal employment, represent a surprisingly large percentage of Brazil's total economic activity. Though estimates are difficult produce, some experts believe that the informal sector makes up about 40% of Brazil's gross national income; in most sectors of the economy, more than half of the activity is informal, especially in sectors of particular importance to favela residents such as retail, food, and maintenance.[209] The food industry, for example, is astoundingly informal. Not surprisingly, around 95% of street vendors in Brazil work illegally.[210] Small food markets are also most commonly informally, if not illegally, organized at percentage totaling about 60% of the total food retailing sector.[211] In slums, these small food markets are common. More common, however, are the local bars patronized largely by the slums' male populations, many of whom spend unemployed days

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[207] Ibid.

[208] Klaarenbeek, "Informal Sao Paulo," 30.

[209] Capp, "Reining in Brazil's Informal Economy," 9-11.

[210] Ibid.

[211] Ibid.

drinking.[212]

The renowned consulting group McKinsey & Company cite that the growth of Brazil's formal economy, at about 3 or 4% over the last decade, has been greatly hindered by such a large informal market.[213] McKinsey argues that reducing the informal market by simultaneously reducing bureaucratic barriers to legally starting businesses and increasing legal barriers to informal employment would greatly increase productivity and Brazil's capacity to grow economically.[214] While formal economic growth is important, especially at present, McKinsey misses another important reason to reduce the dependence on the gray market – legitimacy. The São Paulo city government has historically tended to ignore the problem of the urban poor, though this tendency may be changing. Legitimizing the existence of these people grants them the first step in gaining much greater access to the city's infrastructure. Realistically, this path may not be what the city of São Paulo wants to see happen - ignoring the problem is much, much less expensive – but the case is solid from an ethical standpoint. By legitimizing the informal economy, the urban poor gain a political existence that has long been ignored by creating an economic existence.

Investment and Official Development Assistance to the Poor

Jeffrey Sachs, author of the best-selling book *The End of Poverty*, argues another reason why politically legitimizing the poor could be beneficial to places like Brazil. From a state perspective, the more legitimate citizens, the greater the tax base can be. Sachs argues also that this increase in the public budget can be rerouted into public investment to the benefit of the poor. In other words, if people and businesses are legitimized, then more money goes into the city's coffers. The city can then put that money into infrastructure, health, education, and many other programs that will, in turn, make the newly legitimized

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[212] See note 106 above.

[213] Ibid.

[214] Ibid.

people and businesses more profitable.[215]

The major hurdle of this point of view is government. While proper government management and reinvestment could certainly increase the standard of living of the urban poor in São Paulo, Brazilian government is certainly not known for its competence, reliability, transparency, or lack of corruption. Certainly, for legitimacy of the informal economy to function, the government must be capable of understanding and tackling the issues of a newly legitimized population. Luckily, as the informal economy dissipates, the newly legitimized populace gains political strength. Today, most of the investment politicians make in the slums is to attempt to garner political support by promising favors to the poor. These favors are, not surprisingly, usually ignored or forgotten, though this trend may be changing.

Sachs also argues in favor of Official Development Assistance (ODA) in curbing what he calls the "Poverty Trap." ODA functions as a jump-start to economic growth by increasing capital accumulation. He argues that a healthy balance of foreign money provided directly as assistance to the poor, augmentation of the public budget, and investment in private business can be an incredibly effective economic stimulus.[216] Many monetary organizations exist to jump start economies in this way, such as the IMF and the World Bank, but many of those projects are unsuccessful in stimulating economic growth among the poor.

Success is more common for more nuanced organizations, such as Appfrica International, that encourage growth in a form more akin to the "teach a man to fish" adage. Appfrica International is a not-for-profit organization that trains poor Ugandans to create their own computer programs. Additionally, the organization helps to connect these new programmers with foreign investors. In this way, Appfrica is able to increase the capital of the poor, take some of the load from the educational system (providing value to the

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[215] Jeffrey D. Sachs, *The End of Poverty* (New York: Penguin, 2006) 246.
[216] Ibid.

government), and improve the likelihood of economic growth in the high-tech industry in Uganda.[217]

More conceptually, the idea of Appfrica is successful because it is predicated on the best way by which remote (geographically, socially, and economically) populations can access the world economy, technology. While political fora may be inaccessible, the internet and technology is much more democratic. Anyone with an internet connection and the knowledge can access and contribute to an amazing store of information, facts, and opinions. Connecting the world's poor to the global technological system is another form of producing legal and cultural accessibility in those populations.

Sachs, coming from the perspective of the Earth Institute, naturally assumes that the shot of capital to start a developing economy must originate from charity; however, foreign business ventures, if properly designed, can take the place of ODA.

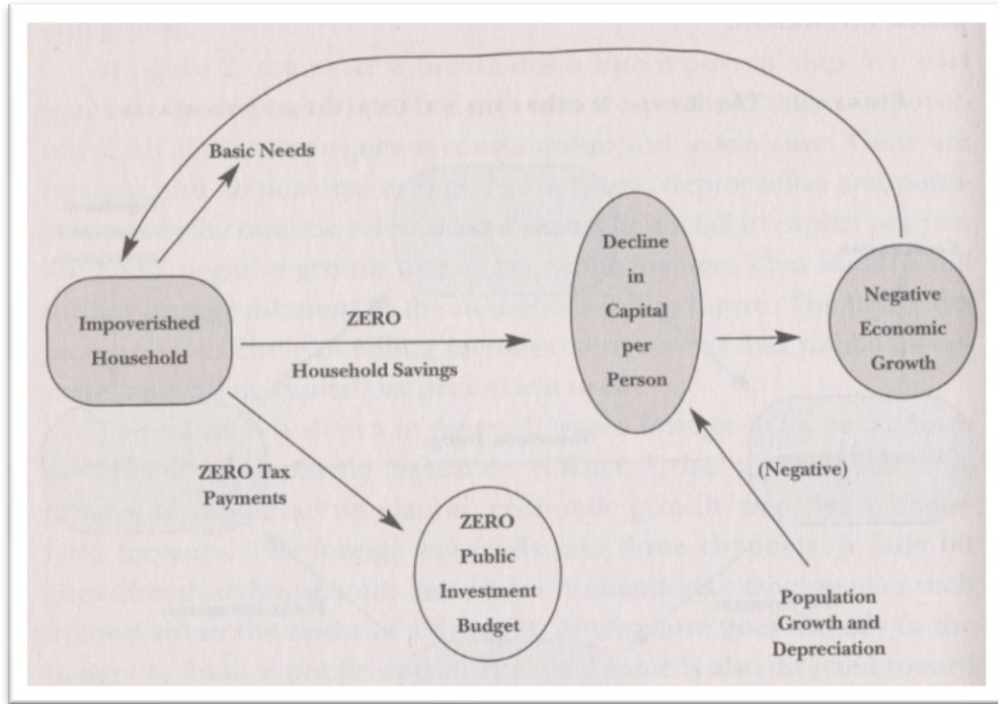[217] Appfrica International, "About Appfrica International," http://appfrica.net/blog/about

Image 13: Poverty Trap as depicted by Jeffery Sachs. [218]
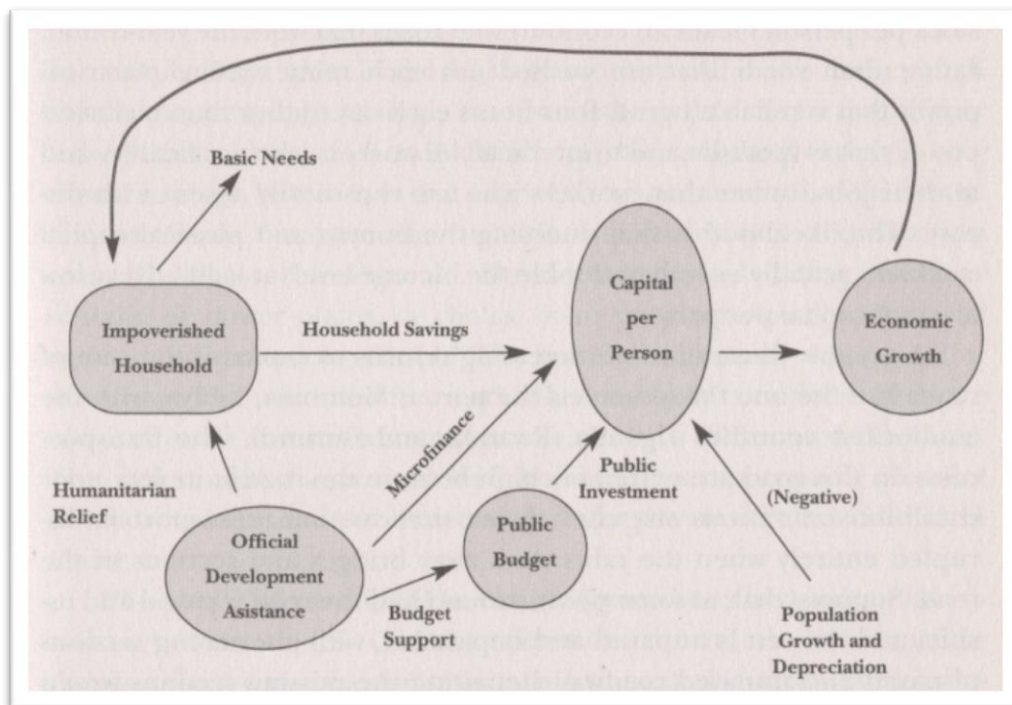

Image 14: Official Development Assistance as depicted by Jeffery Sachs.[219]

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[218]Sachs, *The End of Poverty,* 248-249.

As was argued previously, simply providing money to people and governments is an inadequate method to improve the status of the extremely poor. Foreign corporate investment into favelas has the capability, however, to provide the same increases in capital for favela households, government, and small business that a non-profit organization could while simultaneously producing a profit. The question becomes exactly how business large enough to be interested in capital intense, foreign investment can function in what is largely an informal economy.

Admittedly, foreign investment and economic success in slums around the world has not often been properly managed to increase the standard of living; however, a handful of firms have been able to function profitably in informal economic settings. In addition, the very few ventures that have remained profitable and also equitable have ample lessons on how to do business with the world's poor. The most notable of these are Grameen Bank, Nokia, and Coca Cola.

Learning from Others

Grameen Bank and Microcredit

Grameen Bank is a banking institution dealing entirely in microcredit. The company's founder, Bangladeshi economist Muhammad Yunnus, created the bank in order to provide small loans to the poor of his home country. Over the past three decades, a variety of institutions have begun programs in microcredit, some with success and others without. Yunnus himself won the Nobel Prize in 2006 for his work in giving loans as little as $12. Yunnus, however, is an exception. While he has been able to manage the bank properly, many other banks attempting microcredit schemes have fallen into the regrettable trap of profiteering.[220]

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[219] Ibid.

[220] Celia W. Dugger, "Peace Prize to Pioneer of Loans to Poor No Bank Would Touch," *New York Times*, October 14, 2006.

In these microcredit situations, interest rates are often above what they typically are for their wealthier counterparts. Of course, the risks are greater in microfinance, and increased interest rates are therefore regrettable but not unexpected. Grameen Bank's interest rates are typically reasonable; however other institutions have been known to charge 40% or more in interest.[221] Much to the outrage of Yunnus and others, Mexico's lender to the poor, Compartamosbanco, went public two years ago with interest rates estimated between 70 and 80%. Compartamos argued that its high rates have allowed the company to grow quickly and reach and invest in a significantly larger proportion of Mexico's poor. In fact, in eight years, the number of borrowers has risen from 60,000 to 900,000.[222] While the bank argues that such increases in usage represents fair and equitable treatment (why become a customer if we aren't treating you well?), experts such as Yunnus argue that the poor are in such need that they are evening willing to pay loan shark interest rates.

Brazilian banks and the government have also invested in microcredit schemes, but the success has been varied. In 2002, the government encouraged banks to lend small amounts of money to the poor. Based on lack of knowledge of its poor customers, many of the new bank programs stalled and failed. Over the past years, however, the banks have been able to reorganize, gather information, and prepare for more successful microfinance programs. Today, the average monthly interest rate of Real Microcredito, one of the Brazilian microlenders, is 3.5%, and the investments seem to be paying off even better than their whole market counterparts.[223]

In addition to lending services, banks such as Real Microcredito provide business advice before major lending projects. To customers such as Almir Araujo of Heliopolis, these services taught him how to stock his bar, manage inventory, and track sales. He is now the owner of a DVD store. Real Microcredito was there first to give him a $106 loan to stock

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[221] "Poor People, Rich Returns." *The Economist*, May 15, 2008.

[222] Ibid.

[223] Jonathan Wheatley, "Brazil Microfinance off to a Rocky Start," *Financial Times*, February 26, 2009.

his bar, $4,200 to start his DVD store, and $8,400 to purchase the premises of the store.[224] As is evident, properly managed lending schemes have the potential to greatly improve the standard of living in even the most desperate places, such as the famous Heliopolis favela of São Paulo.

As can be seen, while microcredit can be managed at just a step above charity, it can very easily be managed at rates more akin to a loan shark. In these cases, equity disintegrates, and the scheme proves much more deleterious. For obvious reasons, any large, multinational company with a recognizable logo must avoid such pitfalls for issues of equity but also for issues of marketing. Certainly, no ethical company wants to be seen as a global loan shark to the world's most in need.

Nokia and Consumer Feedback

Nokia's work in global slums has been much less controversial, but most likely because Nokia is hesitant to tote its product as charity to the poor as is the case with microfinance. Nokia has targeted the most quickly growing segment of the cell phone market with incredible success across the globe. This market, of course, is the poor, particularly the urban poor who are easier to access than their rural counterparts.

Nokia's growth in this sector was at first unintentional; however, as cell phone usage in slums increased, the cell phone provider took note. In fact, upon research, Nokia even found that small groups of potential users were pooling money and buying cell phones one at a time for the group.[225] This sort of self-organization is a perfect illustration of the demand for such technology in slums.

Nokia responded quickly and strategically to the demand. First, Nokia altered the cell phones to be particularly suited for life with the world's most poor. In Africa, their cell phones became much more durable, and such features such as dust-proof key pads

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[224] Ibid.

[225] Jack Ewing, "First Movers in Mobile," *BusinessWeek*, May 4, 2007.

became the norm after Nokia executives visited the slums and noted the added strain of electronics in the African slum environment. Additionally, Nokia's emerging market team has improved communication between the consumer and the company by encouraging direct feedback.[226]

In the most recent iteration of this communication between multinational corporation and slum, Nokia founded the Nokia Open Studio. The studio was a design contest in Mumbai, India, Rio de Janeiro, Brazil, and Accra, Ghana, to brainstorm ideas on how to modify technologies to fit the needs of slum residents specifically. As the creators of the studio admit, the process is not a design tool so much as it is a method by which to get feedback about their product from the consumer and to use these preferences and needs to understand the future applications of Nokia's mobile technology.[227] The studio gathered information that led the leaders of the Studio, Jan Chipchase and Younghee Jung, to state:

> Their submissions highlighted that innovation in the context of these communities is not about newness of technology but relevance to the individual's needs, usage contexts, and adaptability, especially for those who are exposed to the spread of technology or technology-driven products in a non-linear fashion compared to more developed markets.[228]

Not only does Nokia take these product concerns back to the design process, but also to the marketing and sale process. Inspired by the cell phone purchasing cooperatives found in their research, Nokia is considering approaches to encourage these forms of self-

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[226] Ibid.

[227] Gaurav Mishra, "Nokia Open Studio: Nokia Asks Slum Residents to Design their Ideal Future Mobile Phones," *Mobichange.org*, November 3, 2008, www.mobichange.org/nokia-open-studio-nokia-asks-slum-residents-to-design-their-ideal-future-mobile-phones

[228] Ibid.

finance.[229]

From a point of sale perspective, outlets for Nokia goods are numerous. In India alone, Nokia estimates that their phones can be purchased at around 90,000 locations, mostly from small vendors where Nokia cannot control how they are displayed and sold. For this reason, the company has produced several small vans and trucks that can access remote areas and explain what the phone does, how it works, and how to purchase one.[230] These vans are mobile advertising to the world's most poor, and the fact that the preferences of these consumers modifies corporate policy at Nokia is a great stride for creating markets in these areas that other companies can and should emulate.

The gambit has certainly paid off. In 2006, Nokia earned $3.7 billion in sales in India alone, making the Finnish cell phone company the market leader in the most quickly growing cell phone market in the world.[231] Additionally, the lessons learned by their enterprises in India and elsewhere have set Nokia as the leader in cell phone sales to the poor across the globe, soon to be the biggest market segment in the world for this technology.

Coca-Cola and the Opportunities of Distribution Networks

Possibly the most successful business to trade viably in the developing world is the Coca-Cola corporation. Without doubt, the Coca-Cola logo is one of the most well-recognized images in the world, even among populations that are desperately poor. The corporation is so powerful that in Africa, the success of the company regularly and accurately foreshadows the political and economic status of the area.[232] Alexander Cummings, the head of Coke's Africa division even admits, "We see political instability first because we go down as far as we can into the market," meaning the poor.[233] In fact, the Economist claims

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[229] See note 225 above.

[230] Ibid.

[231] Ibid.

[232] "Coca-Cola sales as a Measure of Stability and Index of Happiness." *The Economist*, July 3, 2008.

[233] Ibid.

that during the Kenyan post-election violence in 2008, the political issues could be tracked geographically through a decline in Coca-Cola sales as those areas affected were unable to either receive or sell the product.[234]

Additionally, Coca-Cola claims that it is the largest private employer in Africa. Some estimates site that the brand makes up 1% of the total economy of South Africa.[235] As can be seen, Coke is incredibly good at making an enormous profit even from the world's poorest populations. While the scenario certainly seems ambiguous ethically, Coke has managed to provide companies seeking to do business with the poor some important insights. For example, Coca-Cola's African supply system is among the best in the world. As can be seen, there is hardly a hamlet or village without some access to the product, and humanitarian goods such as first aid kits, medicine, and AIDS information can use the same logistics model and, in some cases, the same trucks. In fact, the corporation maintains the largest distribution system in the world, and emulating or possibly teaming with such a system could prove an enormous benefit to both parties.[236]

Getting a Head Start

One of the major advantages in doing business with underdeveloped areas is the high capacity for technological leapfrogging. While developing countries have gone through an evolutionary process to produce the goods and technologies enjoyed today, many of those precursor technologies were made obsolete. As developing areas catch up to already developed countries, producing those outdated technologies is entirely unnecessary. For example, in many areas, it is not necessary to produce telephone lines when cellular towers are both less expensive and more immediately put to use.

While the concept of leapfrogging technologies is commonly used to refer to

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[234] Ibid.

[235] Ibid.

[236] Betsy McKay, "Coca-Cola to Tap its Marketing Muscle to Help Fight AIDS Epidemic in Africa," *Wall Street Journal*, June 20, 2001.

environmental improvement through avoided emissions, leapfrogging offers great potential for social and economic benefit as well. Many other areas have high potential for a variety of leapfrogged technologies such as computing technology, mobility, and the various modes of providing these services.

Possibly the greatest potential exists in creating telecommunications networks such as cellular and wireless, which are particularly relevant for New Mobility solutions that rely on such infrastructure. As was demonstrated in Rio de Janeiro, slums are great sources of latent technological power. Simply by constructing and wiring antennas, houses can be connected nearly instantly to one another and millions of other homes and institutions around the world.

Indeed, many of the technologies currently being used in favelas in São Paulo, such as computers and mobile phones, are already primed for the advent of wireless internet connectivity. In areas such as favelas, creating and maintaining the adequate phone service to provide pluggable internet is not a reasonable proposition; however, a few antennas beaming cheap or free internet wirelessly has a much lower initial cost, a lower annual maintenance cost, is much more easily and quickly repaired, and can be quickly put to use by those in the favelas but also by firms doing business in those favelas. Additionally, wireless internet has already proved itself to be incredibly useful and popular, as described previously.

In conclusion, the market for technology in the developing world, and particularly the favelas of São Paulo, are growing rapidly even in areas without significant increases in living standards. These markets will grow even more quickly in concert with increases in wealth as the world's most poor begin to acquire capital. This growth represents an enormous opportunity for investment that can prove both exceptionally profitable as well as socially and environmentally beneficial. While the risks may be high, and the strategies needed to enter these markets may be novel, the potential gains can outweigh these costs.

RECOMMENDATIONS

The objective of our research was to answer two questions: "How should Ford proceed in their efforts to establish a UMN business in the São Paulo metropolitan region and in its slums?" and "What are some possible business designs for UMN related opportunities in the favelas?" The first question will be answered in the Process Recommendations section and the second in the Business Design Recommendations section below.

Process Recommendations

Ford will have to initiate and manage relationships as they participate in the creation of an urban mobility network in São Paulo and its slums. The recommendations generally fall into three categories Ford has used when establishing UMNs elsewhere: build a network, engage stakeholders, and design a solution. Building a network includes finding, communicating with, and establishing relationships with partners. Stakeholder engagement is the process by which Ford gains an understanding of the current and desired status of transportation and the needs and mental models of network participants. During solution design, participants co-create solutions given the information collected during stakeholder engagement. These recommendations will be written as if Ford would choose to establish a consultancy as discussed in the Business Design section.

Building a network

Ford should signal commitment to long-term relationships by establishing a consistent, frequent presence in São Paulo, preferably in association with an existing Brazilian firm. Ford would be wise to simultaneously foster relationships with existing U.S. multinational companies early. An easy way to create this presence may also be through attending or presenting at new mobility related conferences in or featuring São Paulo. Settling in São Paulo as a consultancy would help ease the initiation of business relationships that could eventually turn into long-term partnerships.

Information presented in the governance and partnership chapters as well as many of the appendices will assist greatly in the identification of partners in São Paulo and for our case study in Pantanal. The organizations, agencies, and individuals discussed or listed therein are certainly not the only potential partners, but they stand out in our research as potentially key. As government plays a critical role in setting the tone for public projects, business with foreign companies, housing policy and environmental policy, it is imperative to monitor government leadership, pending policy, and plans. Encouraging critical analysis of trends in elections, majorities or political parties, and participatory budgeting hearings is an absolutely necessary step to prepare for the future political climate.

The importance of establishing a long-term relationship is also true when considering opportunities in the favelas. Ford is advised to leverage relationships with the agencies and NGOs managing the upgrade as well as the leaders of any neighborhood associations. In favelas that have gone through upgrades, such as Pantanal, identifying community leaders is relatively easier. For favelas without such self-organization, it may prove easier in many cases to network only with organizational (NGO-type) leaders. These leaders have their own perspective.

Other considerations for building relationships—The demand for new mobility solutions increases when cities agree to host highly publicized events such as the World Cup in 2014. By monitoring for such events, Ford can seek out transport agency administrators knowing that there will be increased interest in the new mobility services that Ford could offer. Ford can easily leverage these events.

Governments around the world are all considering what to do in response to the threats posed by calls to mitigate and adapt to climate change, including Brazil. The policy response to these threats should be monitored as it affects the demand for sustainable transportation solutions. Similarly, Brazil's increased involvement on the international stage, e.g., with organizations like G20 and United Nations Security Council, will no doubt affect the government's approach to business with U.S. multinationals.

Stakeholder engagement

Past SNRE master's projects have focused their recommendations on engaging with stakeholders from the formal economy. To add to and supplement this research, the following suggestions are tailored to stakeholders in favelas:

The information gathering process should cover topics like transport behaviors and needs, attitudes toward public transit, availability of and attitudes toward telecommunications. There are a number of ways to get this information in developed areas, but the process will have to be quite different in a favela to get meaningful, representative information. Typical marketing research media, like Internet and mail, are simply not reliable channels of communication in slum environments. As mentioned in the Infrastructure chapter, information about the lives of people in favelas is sparse. Related but undirected questioning will produce better information, relationships, and solutions.

The first, least expensive, and highly valuable source of information will come from established community leaders. In Pantanal, this would be the team of people working for or with CDHU. Special attention should be paid to the leaders that live in the neighborhood. These leaders could also help organize facilitated information sessions. Emulating or partnering with market research NGOs like Mobile Metrix to reach more people and get better info while building a positive relationship in the favela would prove to be an incredibly tool to gather information. Mobile Metrix actually trains and employs a team of people from the slum area who conduct the research, face-to-face with their neighbors. [237]

The fatal flaw of using simply surveys and questioning in marketing research is that the participants' explanations are limited by words and their own self-awareness. Information garnered from conscientiously observing how the people living in favelas already use and might use technology and transportation could be invaluable. It is best to think of this

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[237] "Business Model," http://www.mobilemetrix.org/ 2009.

kind of observation through the framework of a "service journey." A service journey is an intentional, non-intervening observation of the customer in settings that require or might require the firm's product or service.[238] In this case, a service journey might include shadowing people on their commute to work or shadowing them as they try to find a way to somewhere new. On such a journey, you could observe the telling non-verbal cues about how the person may feel about a particular setting or action. For example, a person might not find a place to report that they have to take their gloves off to use a cell phone in the cold in a typical marketing survey but this information could greatly improve the design of the phone.

Designing a Solution Set

The information and perspective gained during stakeholder engagement should only be used to shape the conversation around solutions designs. Despite having newfound understanding of the needs of the people living in the favela, Ford will gain from co-creating solutions with the people who will actually use the products. Ford is selling the benefit of connections to other opportunities. How the customer accesses those benefits should be as tailored as possible to ensure that Ford consistently delivers the benefits new mobility networks promise. Through co-creation, Ford can match the needs of the people living in slums with solutions that are profitable and environmentally sound.

The Culture chapter's discussion of Hofstede's dimensions is pertinent when determining how best to approach communications in Brazil. When communicating about new mobility, make reference to as many existing norms and understandings as possible, as Brazilians, generally speaking, have attitudes against change. For example, it is likely that people living in favelas are familiar with "smart pass" applications in public transit. Ford can build on this understanding to explain what new mobility would be like in service to favela residents.

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[238] Dorothy Leonard and Jeffrey F. Rayport, "Spark innovation through empathetic design," *Havard Business Review*, November-December 1997, 105.

Additional Suggestions

New mobility in a favela will no doubt introduce a host of new technology interfaces and, likely, transportation modes. Although the products will be designed for ease of use, the use of the new mobility system will cause a fundamental change in behavior and thinking. As such, Ford should review transportation behavior change literature while creating marketing plans. Based on our research into this kind of literature as discussed in Appendix N, behavior change literature suggests a much different approach than traditional marketing messaging.

Ford must plan for and avoid possible negative consequences of engaging in business within the favelas. St. Edwards University business professor Kathleen Wilburn suggests "develop[ing] scenarios that will help identify possible negative consequences of socially responsible projects so that the project implementation can be monitored for such consequences and interventions designed to decrease or counter the impact of negative consequences."[239] Wilburn suggests asking questions like "what would happen without this development project?" and "what will this neighborhood look like ten years from now assuming we engage?" [240] Certainly new mobility solutions will consider the long-term environmental consequences in light of climate change and other pressing environmental concerns. These visioning exercises will be especially helpful when considering the long-term societal effects of new mobility.

Business Design Recommendations

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[239] Kathleen Wilburn, "A model for partnering with not-for-profits to develop socially responsible business in a global environment," *Journal of Business* Ethics 85, (2009), 111.
[240] Kathleen Wilburn, "A model for partnering with not-for-profits to develop socially responsible business in a global environment," *Journal of Business Ethics* 85, (2009), 115-117.

When the team considered all of the information and recommendations discussed in the preceding chapters, we began to see a few possible business designs a multinational company in the UMN business could assume.

Consultancy

When we considered the following conditions, the picture of a business that looks like a consultancy surfaced. As mentioned in the Culture Chapter, Brazilian organizations and individuals greatly value long-term relationships in business. Furthermore, Brazilian organizations are hesitant to engage with non-Brazilian firms in partner-based relationships (rather than traditional, buyer-supplier relationships). As such, it is more reasonable to assume that a multinational company would have to plan for a long buildup to begin any partnerships, but could enter the market with relatively more ease in a more traditional business model.

There are a number of services we can see a UMN consultancy providing to São Paulo customers. On the city level, the consultancy could sell its services to, or bid on projects with, transportation and urban planning agencies. As mentioned in the Governance Chapter, São Paulo state already has long-term plans to implement what sounds like a new mobility network, and political leaders have been advertising the opportunities for public-private partnerships.

As mentioned in the Slum Upgrading policy section of the Role of Government chapter, transportation and telecommunication considerations are not consistently a significant part of the slum upgrade plan, despite the importance of these resources. A UMN consultancy could garner expertise in incorporating the urban poor into an UMN and then sell that expertise to slum upgrading agencies or to the favelas directly.

To sustain and build stability into revenue streams, the consultancy could structure engagement contracts to include a low, fixed, upfront charge for design consultation and a percentage charge of the ridership fares, or similar variable use charge, from the

implemented mobility solutions. Over the longer term, the consultancy could stimulate demand from its existing customers by offering support and update services. These services would accommodate increasing demand as public transit improves and favelas are upgraded to a UMN "ready" state.

Products

While the basis of Ford's presence in São Paulo needs to be centered on gathering and managing information in order to make recommendations as a consultant, managing that transit information lends itself functionally towards a few marketable products, such as integrated information networking software, transit applications for cellular phones, and communal transit kiosks. Managed correctly, these products could become a profitable product of Ford's expertise in transit and in the city of São Paulo.

Integrated Information Network—As Ford gathers information about the various modes of transport in São Paulo and organizes the information, the company has the opportunity to produce software that can monitor and track these modes throughout the city. With technical help from companies such as IBM, Ford can position itself as an expert on transportation information integration in order to produce legitimacy.

Once this networking software is created, real-time information could be drafted into a downloadable software application for cell-phones and computers, providing access to information for buses, trains, and last-mile solutions.

For even simpler information access, the UMN business could create a request-response system utilizing cell-phone text (SMS) messages to provide basic information such as departing times for buses or trains at a particular location. Such a system has been created and used in cities in the US (Washington, DC, San Francisco). (http://traincheck.com/)

Transit station—In the same vein, software applications could be housed in an ATM-like kiosk that would provide the same integrated information network as well as offer the ability to organize ride-shares. While this product would be more capital intensive to provide city-wide, it may prove more promising in slums where cellular phone applications may not function as well or computers are not as commonly owned. These stations would provide more equal accessibility to all of those in a favela. Also, if subsidized, these stations could be provided for free to the favelas.

Ride-Sharing Software—Leveraging the strong sense of community often found in favelas, a software application could be developed to help coordinate rides--that is, get people together in the same car, perhaps one rented via a car-sharing system, who are travelling to similar destinations in order to increase efficiency. The ride-sharing information could be linked up with the hub network information software described above. With this, a user could arrive at a kiosk, sign up to share a ride with someone driving to a destination of interest or transit stop, and access the times at which a subsequent bus or other mode will be departing.

The ride-sharing software could also be particularly effective in regards to the movement of bulk goods and supplies--replacing or supplementing the use of hand-carts seen around the city by putting the supplies of multiple persons or organizations all on one van or truck. A similar type of shared distribution has developed between NGOs and companies like Coca-Cola (See chapter: The Informal Economy), delivering essential supplies to rural areas in Africa along with regular product shipments.

Transportation System Consultancy—The integrated information network software, if developed in such a way, could indicate where gaps and problems in the transportation system exist. The Secretary of Metropolitan Transport might find it valuable to be able to pinpoint system inefficiencies and gaps. Furthermore, if the software found busing to be inadequate in a certain region, for example, Ford would be the obvious choice for those new buses. Hopefully, creating and updating this system

would be a priority of the São Paulo municipality, and government funding could almost certainly be produced.

   Generating Revenue—With each of these products, Ford has the potential to add revenue streams by selling the software applications or essentially selling transit information. With this method, Ford could sell software and cell phone applications in a tiered manor, tailoring the depth of information according to a pricing schedule in order to promote greater accessibility while still generating revenue. Like automotive GPS systems, this system could be upgraded periodically for an additional fee.

The other, more socially equitable method would be to provide the information for free - free computer and cell phone applications, transit kiosks with no cost to access, etc. - in order to increase ridership and subsequently the amount earned through the agreed upon ticket fare or ridership percentage.

Another option would be to mix methods of information distribution--some at cost and some free. For example, the cellular phone applications (cost) and the transit kiosks (free) could be launched simultaneously, the kiosks for the social benefit of the poor and to increase overall ridership and the applications in order to produce profit for Ford. This mixture would prove beneficial for São Paulo but would require a dedicated blend of partnerships that would demand a great deal of attention of Ford. Certainly, running such a business in Brazil must be done with a constant and consistent attention to relationships.

Incubator

There will be opportunity many transportation and technology related solutions as favelas connect to public transit systems for the fist time. These solutions will fill the gaps that will likely exist between people, products, and information and the transport and information networks they seek. When considering Pantanal, one such gap will no doubt exist after the new train station is built nearby in 2010. There will be a need to create "last-mile"

solutions that get people from the neighborhood and too the train station. It is likely that Ford could seize the opportunity and provide the solution directly; however, where the solutions necessary to fill these gaps do not align with Ford's own core competencies, Ford could work with entrepreneurs in the neighborhood to fill the need.

The relationship would look a great deal like an incubator as discussed in the Partnerships chapter. The funding source would still be the government, but the funds would come through the slum upgrade agency instead of a university. This scenario is assuming that government would have the funds to support a favela business incubator. Other variations on the incubator set up are definitely possible. It is also conceivable that Ford might partner with a microcredit firm to establish the incubator. Ford would be able to guide the entrepreneurs to more sustainable solutions like electric cars, biodiesel shuttles, bike sharing, car sharing, small-scale delivery systems, or bike carts. They would also be able to assure that whatever solutions provided would be easily connected to the existing UMN in terms of transport and information.

As can be seen through our recommendations as well as the preceding research, opportunities for Ford Motor Company in the São Paulo are tremendous. While care must be taken in developing these business opportunities, proper management or information and, particularly, of relationships has the potential to open an exciting new business model for Ford in the world's fastest growing market. Simultaneously, Ford has the opportunity to improve the daily lives of many of the world's poor and improve efficiency and environmental good in areas that are often most in need. Properly managed, the opportunities for succeeding in a triple bottom line business demand exploration, and São Paulo is at a point in development that will lend itself readily to this new business form. Ford Motor Company should absolutely explore these opportunities.

APPENDIX A:

Election Schedule

Role	Upcoming Election
Federative President	2010
São Paulo Governor	2012
São Paulo Mayor	2012
Chamber of Deputies	2010
Federal Senate (see note)	2010 (two-thirds of seats)

Note: Senate elections are held every four years, alternating between one-third (27) and two-thirds (54) of the seats.

Research Institutes, Researchers, and Professors of Relevance

Name	Description	Website or Email Address
Institute for Transportation and Development Policy	Research institute that promote environmentally sustainable and socially equitable transportation worldwide	http://www.itdp.org/index.php
Peter M. Ward	Professor of Sociology and Latin American Studies, University of Texas, Austin	peter.ward@mail.utexas.edu
James Holston	Professor, UC Berkeley	jholston@berkeley.edu
Sergio Pacca	Professor of Environmental Sciences, University of São Paulo	spacca@usp.br
Jeffrey Sachs	Professor and Director of the Earth Institute, Columbia University	sachs@columbia.edu
Embarq	Part of the World Resources Institute for Sustainable Transport	www.embarq.net
Centre for Sustainable Transportation	Institute from the University of Winnipeg. Although the Centre is mostly Canadian issues, it could be a valuable tool for making more connections worldwide.	www.cst.uwinnipeg.ca/
Cities for Mobility	Important global center of mobility solutions for rich and poor.	http://www.cities-for-mobility.net/index.php?option=com_content&view=frontpage&Itemid=163
global Transport Knowledge Partnership	Center of sustainable transportation information and development. Produces a great deal of important literature and is connected to numerous researchers and	http://www.gtkp.com/

	universities as well as global projects.	
International Council on Clean Transportation	Produces reports on transportation modes and systems.	http://www.theicct.org/
International Institute for Energy Conservation	Institute with an office in Rio, this organization is a more general reference for information and further contacts.	http://www.iiec.org/
International Forum for Rural Transport and Development	Not immediately applicable to urban mobility, but may share resources and contacts.	http://ifrtd.gn.apc.org/new/index.htm
UN Habitat: Urban Transport Programme	Specific to developing countries, UN Habitat could prove to be a valuable partner.	http://www.unhabitat.org/content.asp?cid=849&catid=373&typeid=24&subMenuId=0
World Sustainable Mobility Project	Part of the World Business Council on Sustainable Development, this organization publishes useful research.	http://www.wbcsd.org/templates/TemplateWBCSD5/layout.asp?type=p&MenuId=ODE&doOpen=1&ClickMenu=LeftMenu

APPENDIX C:

List of federal, state, and local agencies for various policy issues

General Governance

Name (Portuguese)	Name (English)	Website
Governo do Estado de São Paulo	Governor of São Paulo State	http://www. Sãopaulo.sp.gov.br/
Prefeitura da Cidade de São Paulo	Mayor of São Paulo City	http://www.capital.sp.gov.br/portalpmsp/homec.jsp
Região Metropolitana São Paulo	São Paulo Metropolitan Region	(unofficial) http://barreiros.arq.br/RMSP/metropolitana.htm
São Miguel Paulista	São Miguel Paulista	http://www. Sãomiguelpaulista.com.br/

Transport Agencies

Name (Portuguese)	Name (English) and Description	Website
Secretaria de Estado dos Transportes	Secretary of Transport for São Paulo State	http://www.transportes.sp.gov.br/v20/default.asp#
Secretaria dos Transportes Metropolitanos	Secretary of Transport for São Paulo Municipality	http://www.stm.sp.gov.br/rmsp.htm
Companhia Paulista de Trens Metropolitanos	São Paulo Company of Metropolitan Trains	http://www.cptm.sp.gov.br/
Departamento Estadual de Trânsito- São Paulo	São Paulo State Department of Transit	http://www.detran.sp.gov.br/
Companhia do Metropolitano de São Paulo	São Paulo Metro Company	http://www.metro.sp.gov.br/
Secretaria do Emprego e Relacoes do Trabalho	São Paulo State Secretary of Employment and Labor Relations	http://www.emprego.sp.gov.br/
Dersa Desenvolvimento Rodoviario S.A.	Dersa Road Development under the State Secretary of Transport	http://www.dersa.sp.gov.br/

Environmental Agencies

Name (Portuguese)	Name (English) and Description	Website
Secretaria do Meio Ambeinte	Secretary of Environment for São Paulo State	http://www.ambiente.sp.gov.br/
Secretaria Municipal de Verde e Meio Ambiente	Municipal Secretary of Green and Environment	http://www2.prefeitura.sp.gov.br/secretarias/meio_ambiente
Companhia de Tecnologia de Saneamento Ambiental	Technology and Environmental Health Company for São Paulo State under teh Secretaria do Meio Ambiente	http://www.cetesb.sp.gov.br/
Conama: Conselho Nacional do Meio Ambiente	National Council of Environment	http://www.mma.gov.br/conama/

Housing Agencies

Name (Portuguese)	Name (English) and Description	Website
Ministerio das Cidades	Ministry of Cities	http://www.cidades.gov.br/
Secretaria de Estado de Habitacao	São Paulo State Secretary of Housing	http://www.sehab.df.gov.br/
Secretaria Municipal de Habitacao	São Paulo Municipal Secretary of Housing	http://portal.prefeitura.sp.gov.br/secretarias/habitacao
Secretaria da Habitacao	São Paulo State Secretary of Housing	http://www.habitacao.sp.gov.br/
Companhia de Desenvolvimento Habitacional e Urbano do Estado de São Paulo (CDHU)	São Paulo State Company of Urban Housing	http://www.habitacao.sp.gov.br/saiba-como-funciona-a-cdhu/index.asp

Other Agencies

Name	Name (English) and Description	Website
Secretaria de Saneamento e Energia	Secretary of Sanitation and Energy	http://www.saneamento.sp.gov.br/

APPENDIX D:

Businesses and potential partners in telecommunications or transport

Name	Description	Website
CEVA	US Multi-modal transport logistics	www.cevalogistics.com/
Owens-Illinois	US Glass manufacturer near Pantanal favela	www.goliath.ecnext.com/coms2/product-compint-0001192113-page.html
IBM Innovation Center	US Technology company	www.304.ibm.com/jct01005c/isv/spc/ Sãopaulo.htm
São Paulo Confia	Microcredit company serving Pantanal Favela Region	www. Sãopauloconfia.org.br/index. php
Companhia Paulista de Trens Metropolitanos (CPTM)	The major train company of São Paulo, owned by the State Secretary of Metropolitan Transports (STM)	www.stm.sp.gov.br/ingesp/english.html Contact: fale@stm.sp.gov.br
Empresa Metropolitana de Transportes Urbanos (EMTU)	Company under which independent bus companies function	Web: www.emtu.sp.gov.br/ Address: Rua Boa Vista, 236, 01014-000 São Paulo Tel: 0800 771 0118 (24 hours)
São Paulo Transporte SA (SPtrans)	Supervisor of independent bus companies	Web: www.sptrans.com.br/sptrans08/home/ Tel: 0800 724 0555
Coopertax	Major Taxi Company	www.coopertax.com.br Tel.: +55 11 6195-6000
Radiotaxi Vermelho e Branco	Major Taxi Company	www.radiotaxivermelhoebranco.com.br Tel.: +55 11 3146-4000
Guarucoop	Major Taxi Company	www.radiotaxiazulebranco.com.br Guarulhos Airport - Governador André Franco Montoro. Tel.: +55 11 6445-3552 / +55 11 6445-3452
Embratel	Land-line phone company now	www.embratel.com.br/

	offering broadband internet and cable television.	
Telefonica	Same as above	www.telefonica.com.br
TIM	Cell phone provider	www.tim.com.br/portal/site/ PortalWeb/menuitem.06243 559e24e67a19a132910703016a0
Claro	Cell phone provider	www.claro.com.br/portal/
Vivo	Cell phone provider	www.vivo.com.br/portal/home.php
Oi	Cell phone provider	www.sp.digaoi.com.br/portal /oipravoce/index.html
JDA Software	Transportation and Logistics Software Firm in São Paulo	Web: www.jda.com/company /aboutus.html Address: Alameda Santos, 95, 10th Floor, 01419-001 Tel: 11.3897.8300
Wherify	Company working with Delphi in São Paulo creating wireless networks	www.wherifywireless.com

APPENDIX E:

NGOs of particular relevance

Name	Translations and Description	Website
Ethos Institute	Corporate Social Responsibility organization in São Paulo	http://www.ethos.org.br/DesktopDefault.aspx?Alias=EthosEnglish&Lang=en-US
Nossa São Paulo	Our São Paulo, watchdog group for Brazil that gathers useful partnerships	http://www.nossa Sãopaulo.org.br/portal/
Mobile Metrix	Global organization that promotes employment while gathering information about the world's "invisible poor"	http://www.mobilemetrix.org/
Transparência Brasil	Transparency Brazil, watchdog group promoting government transparency	http://www.transparencia.org.br/index.html
Shack/ Slum Dweller International	Organization promoting the concerns of the world's slum residents	http://www.sdinet.org/reports2/rep89.htm
Instituto Akatu	Akatu Institute, organization promoting ethical consumption	http://www.akatu.net/
Grupo de Institutos Fundações e Empresas	Group of Institutes, Foundations, and Companies, Group of U.S. multinationals that meet to discuss CSR recommendations in Brazil	http://www.gife.org.br/
Grupo Tecnico de Apoio	Technical Support Group, organization that works on social action, housing, environment, sanitation, and urbanization in Brazil	http://www.gtaproj.com.br/
Movimento de Defesa dos Favelados	Movement for the Defense of Slum Dwellers, organization promoting the rights of the poor	http://www.mdf.org.br/#
Nomadic Kitchen	Art initiative that engages in the process of negotiating the urban environment with the residents	http://www.projetonua.com.br/

	of Uniao de Vila Nova	

APPENDIX F:

Useful Upcoming Conferences

Name	Description	Location and Date	Website
Urban Age Istanbul Conference	investigations into the links between the social characteristics and the physical form of global cities	Istanbul, Turkey November 2009	http://www.urban-age.net/
Transpoquip Latin America 2009	Transportation logistics	São Paulo, Brazil September 2009	http://www.transpoquip.com/
Ethos Institute	Towards a New Global Economy: Transforming People, Business and the Society	São Paulo, Brazil June 2009	http://www.ethos.org.br/ci2009Dinamico/VER SÃO_Ingles/verconteudo.asp?idSecao=156
Americas/Society	The global financial crisis, Brazil's relationship with U.S., foreign investors perspective on Brazil	São Paulo, Brazil June 2009	http://as.americas-society.org/calevent.php?id=430
International Conference	Megacities: Risk, Vulnerability and Sustainable Development.	Leipzig, Germany September 2009	http://www.megacity-conference2009.ufz.de/
Cities for Mobility 3rd World Congress	Meeting centering on the social aspects of mobility for those with and without access to motorized modes of transport.	Stuttgart,Germany June 2009	http://www.cities-for-mobility.net/index.php?option=com_content&view=frontpage&Itemid=163

APPENDIX G:

Map of Brazilian States

http://geology.com/world/brazil-map.gif

APPENDIX H:

Map of São Paulo State

APPENDIX I:

Map of São Paulo Metropolitan Area

http://www.stm.sp.gov.br/english/rms.jpg

APPENDIX J:

GIS Map of São Paulo Metropolitan Region Including Santa Isabela and Pantanal

www.maps.google.com

Map of São Paulo SubPrefectures

1 • PERUS
2 • PIRITUBA
3 • FREGUESIA/BRASILÂNDIA
4 • CASA VERDE/CACHOEIRINHA
5 • SANTANA
6 • TREMEMBÉ/JAÇANÃ
7 • VILA MARIA/VILA GUILHERME
8 • LAPA
9 • SÉ
10 • BUTANTÃ
11 • PINHEIROS
12 • VILA MARIANA
13 • IPIRANGA
14 • SANTO AMARO
15 • JABAQUARA
16 • CIDADE ADEMAR
17 • CAMPO LIMPO
18 • MBOI MIRIM
19 • SOCORRO
20 • PARELHEIROS
21 • PENHA
22 • ERMELINO MATARAZZO
23 • SÃO MIGUEL
24 • ITAIM PAULISTA
25 • MOOCA
26 • ARICANDUVA
27 • ITAQUERA
28 • GUAIANASES
29 • SAPOPEMBA
30 • SÃO MATEUS
31 • CIDADE TIRADENTES

http://data3.blog.de/media/460/2124460_d4239f4e2b_m.png

Map of São Paulo Districts

MAP 5.1. Districts of the municipality of São Paulo, 2000.
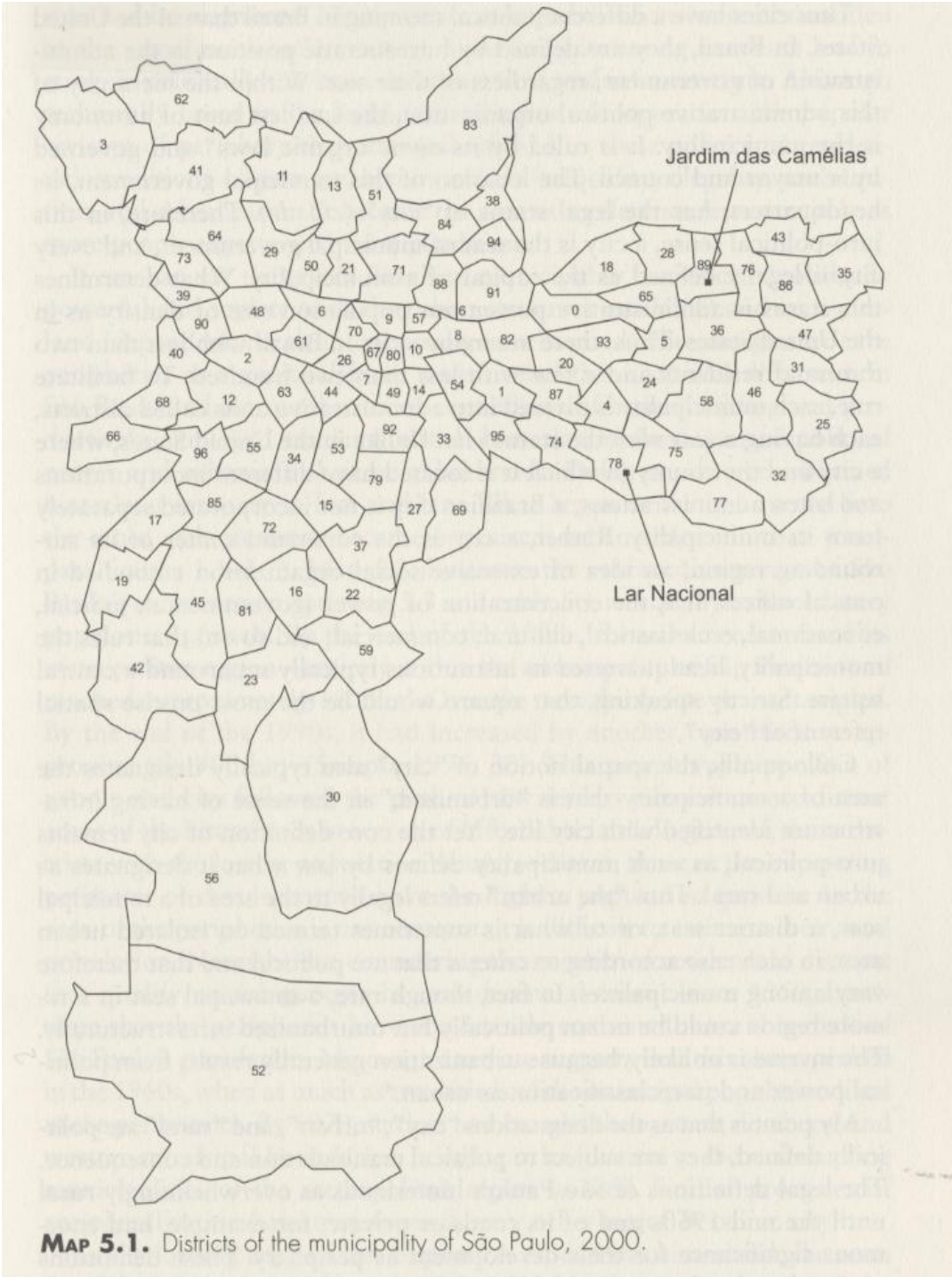
1.	Água Rasa	49.	Liberdade
2.	Alto de Pinheiros	50.	Limão
3.	Anhanguera	51.	Mandaqui
4.	Aricanduva	52.	Marsilac
5.	Artur Alvim	53.	Moema
6.	Barra Funda	54.	Moóca
7.	Bela Vista	55.	Morumbi
8.	Belém	56.	Parelheiros
9.	Bom Retiro	57.	Pari
10.	Brás	58.	Parque do Carmo
11.	Brasilândia	59.	Pedreira
12.	Butantã	60.	Penha
13.	Cachoeirinha	61.	Perdizes
14.	Cambuci	62.	Perus
15.	Campo Belo	63.	Pinheiros
16.	Campo Grande	64.	Pirituba
17.	Campo Limpo	65.	Ponte Rasa
18.	Cangaíba	66.	Raposo Tavares
19.	Capão Redondo	67.	República
20.	Carrão	68.	Rio Pequeno
21.	Casa Verde	69.	Sacomã
22.	Cidade Ademar	70.	Santa Cecília
23.	Cidade Dutra	71.	Santana
24.	Cidade Lider	72.	Santo Amaro
25.	Cidade Tiradentes	73.	São Domingos
26.	Consolação	74.	São Lucas
27.	Cursino	75.	São Mateus
28.	Ermelino Matarazzo	76.	São Miguel
29.	Freguesia do Ó	77.	São Rafael
30.	Grajaú	78.	Sapopemba
31.	Guaianazes	79.	Saúde
32.	Iguatemi	80.	Sé
33.	Ipiranga	81.	Socorro
34.	Itaim Bibi	82.	Tatuapé
34.	Itaim Paulista	83.	Tremembé
36.	Itaquera	84.	Tucuruvi
37.	Jabaquara	85.	Vila Andrade
38.	Jaçanã	86.	Vila Curuçá
39.	Jaguara	87.	Vila Formosa
40.	Jaguaré	88.	Vila Guilherme
41.	Jaraguá	89.	Vila Jacuí
42.	Jardim Ângela	90.	Vila Leopoldina
43.	Jardim Helena	91.	Vila Maria
44.	Jardim Paulista	92.	Vila Mariana
45.	Jardim São Luís	93.	Vila Matilde
46.	José Bonifácio	94.	Vila Medeiros
47.	Lajeado	95.	Vila Prudente
48.	Lapa	96.	Vila Sônia

James Holston, *Insurgent Citizenship: Disjunctions of Democracy and Modernity in Brazil*. (Princeton and Ontario, Princeton University Press, 2008),150.

APPENDIX M:

Trip Journal

Friday, October 17, 2008

- Met with Sergio Pacca--USP Professor
    - The drive to USP was particularly interesting, marked by pedestrians on the highways, slums pressed against walls on the sidewalk, and high density (but not "upwards") urbanization with little to no open space.
    - The education system is backwards - school is free through high school, but good high schools are private and expensive. Good universities are free, but it takes private secondary schooling to get into one. So, it is relatively guaranteed that the poor can't get good post-secondary education.
    - USP is bounded on one side by a large (ugly, unkempt) park that cannot be easily accessed, especially by the nearest favela. Residents have to walk three miles to get to the park even though, as the crow flies, it's only a few hundred yards away - in places, less.
    - The train is useful for students, but skips the favela. It is packed during peak hours, and its construction caused roads to have to go through periodic, tiny tunnels that greatly reduced mobility for the favela residents.
- Toured Favela with USP students
    - The favela was (relatively) bustling with trucks, cars, people, commerce.
    - The community was organized and had various partnerships with businesses. For instance, they are allowed to plant food crops up to six feet high under power lines where the land is owned by the utility.
    - Fruit trees were everywhere. One man ran the operation to keep them growing, and all were welcome to take fruit.
- Met with Marcia Gomes with Ford Brazil
    - The air is filthy with particulates.
    - There is what turned out to be a failed raised bus system.
    - Focus Group with Teens from Favelas
        - Diogo - 17 yr. old. has worked for Ford for 20 months.
            - Works in truck operations; lives in S. Bernardo (close)
            - 40 minute Ford bus ride
            - Arrives at Ford at six in the morning
            - Plans to be a mechanical engineer
        - Daniella - 17 yr. old. has worked for Ford for 12 months
            - 1.5 hour commute each way
            - Father owns a grocery in her neighborhood
        - Jessica - 17 yr. old. has worked for Ford for 15 months
            - Works in purchasing
            - 40 minutes to work
        - Rubens - 17 yr. old. has worked for Ford for 11 months

- Works in Quality Control
- Takes public bus to Ford bus totaling about 40 minutes in transit
- Josimar - 17 yr. old. has worked for Ford for 11 months
    - Works in product development
    - 40 minutes to work
- Aline - 17 yr. old. has worked with Ford for 18 months.
    - Lives in a favela. The family owns the house, but not the land. The owner can kick them off at any time.
    - Has water, electricity, sewer, and even internet.
    - Father is security guard (common), and her mom is a cook.
    - The favela is now calm, and she likes it, but it had been an area of conflict.
- Major points:
    - These kids never work in assembly, only administration.
    - Ford has English classes.
    - The kids liked their communities and generally called them calmer, safer, and cleaner than the city.
    - Some complaint that there are too many bars, and they wake up at night because of the noise.
    - Many roads are unpaved, so the area is very dusty.
    - Property rights are an enormous issue. Favelas must maintain much of the infrastructure.
    - Bike access is not great.
    - They need better people transport (other than the car) .
    - Two of them have never taken the subway because the lines are too limited
    - Cars are nice, but expensive. Also, they aren't remarkably safe.
    - They wanted more buses and a better bus schedule.
    - They wanted better pollution control.
    - They complained how difficult it was to get a drivers' license.

Saturday, October 18, 2008

- John Sooter tour of Santa Isabela/Chiclete Favela
    - Very poor and small. Surrounded by an otherwise middle-class, nice neighborhood.
    - There was only one vehicle accessible road then only small "capillaries" weaving though the houses.
    - There were a lot of single women with children.
    - If they have jobs, they leave the favela to get there.
        - Generally, men work as security guards and construction workers, women as cleaning ladies.

- History of drug-trafficking. John Sooter explained that if you are out of a job and offered work by a drug-dealer, you essentially cannot say no (need the money, which is much more than a normal job pays, plus the dealer will not be said no to because of the power he holds).
    - If given powdered milk, some mothers would sell it to pay off drug dealers.
- The people there needed other ways to generate their own income--not have to rely on intermittent jobs and not have only drug-dealing as a self-employment option.
- There was one, maybe two, small stores in the favela for food and drinks. On the road to and from the favela there was a small grocery store (that is apparently much more expensive than if they go to a larger store further away) and one or two street vendors.
- The residents tend to lack gratitude for when they are given things or helped by the NGO.
    - The NGO is much more interested in offering classes and help to children as they have found the adults to be less grateful, and also they have historically stolen things, etc., or have been embarrassed to attend reading classes. Progress is much more evident with the children.
- Police corruption and brutality is a norm. Someone John knew hit a child in a favela with his car and killed him, and he was able to bribe his way out of it with $500. There are two police forces, one municipal police force known for absolute corruption and the military police known for brutality. The military police won't hesitate to take action in favelas that could be described as genocide.
- Children's day activities
    - We asked John for a success story about his favela, and he said, "Well, after twelve years here, most of the kids say 'thank you' when we give them cake."

Sunday, October 19, 2008

- Attempted tour of the East side Favela failed (USP student could not meet us as planned.)
- City exploration--Paulista Ave
    - There is a distinct difference between rich and poor here. We went to an antique market housed under the modern art museum. Middle class people were having quite a nice time. Also, there was an adjacent park that was beautiful, full of trees and foliage and art. It in no way compared to the "park" near the favela the first day.
    - Very few people here speak English. Even a lot of the vendors didn't know English numbers. Tourism must not be a significant force here; however, they were all friendly towards us in our attempts to communicate.

- Paulista Avenue is supposed to be one of the most glamorous, important roads in all of South America. It was not particularly well-kept, clean, or glamorous. It housed mostly banks and electronics shops.
- Dinner with Moana Simas, USP student
  - Moana seemed to reflect the views of a few of the students we had talked to - mostly, she very vocally disliked São Paulo due to traffic, safety, and pollution.
  - She seemed hesitant to believe in the possibility for really significant change in the favelas.
  - While driving, she can't keep her purse on the seat next to her, and she doesn't feel safe during traffic jams, when she is stuck in her car.
  - She drives more than uses public transportation.
  - Her car uses ethanol, a much cheaper automotive fuel that is better in some regards to pollution, but also puts out more particulates that cause the stifling haze over the city.

Monday, October 20, 2008

- City Exploration--finding central slums
  - Using favela maps and Google Earth, we attempted to produce a walking route in São Paulo that we could find a central, rather than periferal slum.
  - Our research has indicated that there were significant difference between central and periferal slums, and we were eager to see for ourselves.
  - We were unable to find what we had seen on our drive in from the airport, but many side streets led to less developed neighborhoods.
- Walk through less touristy parts of the city
  - Despite the research that implied central slums were ubiquitous, we were not able to find any during a 2.5 mile walk to the northwest of our hotel. We were able to find some certainly poor areas, but no favelas.
  - In the poor areas, any free space is immediately fenced and controlled - most likely to avoid the formation of favelas. We saw one of these areas, an old gas station, that was monitored and had a 10 or 12 foot fence around the entire perimeter of the tiny lot.
  - Today, we stumbled upon a large series of bustling plazas that was certainly not for tourists, but were full of people - businessmen, it seemed, mostly, but also people walking to the market and running errands.
  - The transportation system is a complete jumble. Our directions were not even correct for walking, street signs are absent, and streets change names without warning. It is certainly not easy to navigate.
- Introduction to the metro system
  - The metro, however, was incredibly easy to navigate, and the two hour walk in search of favelas was reversed using the metro in about 15 minutes.
  - The metro was not extremely inexpensive and would have been out of the ability of most favela dwellers to pay on a regular basis.

- Even though it was a Monday, there were plenty of seats on the train. We could have just as easily been on a train in NYC (or somewhere even nicer!).

Tuesday, October 21, 2008

- Meeting with the Nossa SãoPaulo
  - This organization is the head of many smaller departments spanning all the problems of São Paulo, including urban mobility.
  - The key current goals are very closely related to government - insure consistency between mayors and transparency to avoid corruption.
  - The meeting records will be incredibly valuable.
  - HERE IS A MAJOR OPPORTUNITY FOR FORD PARTNERSHIPS
- CDHU presentation at USP
  - We got the background of the CDHU and of Pantanal. Unfortunately, the presentation was in Portuguese.
- CDHU tour of upgraded Favela called Pantanal
  - General notes:
    - Pantanal is much bigger than Chiclete, having around 8,000 people.
    - The people like where they live and don't want to leave.
    - They are located near the river and in flood prone-areas.
    - There is quite an impressive recycling center there, but as expected, the materials leave the favela to be recycled as new materials come in.
    - I asked about the possibility of a community (food) garden and was told they are going to have a community garden but only for non-food-producing plants.
    - The label of "favela" is disliked and creates a stigma.
    - There is NO bank or even an ATM in the favela, which one CDHU member said would be hugely beneficial for the people (and the bank!).
    - Water availability is an increasing issue.

  - Mobility
    - there is a train that passes RIGHT past the slum, but there is no station for access.
    - Many of the people take the train (the station is ~6km away, however) to the city-center for their jobs.
    - The city buses do come into the slum although they only have one inconvenient way in and out.
    - From what I understand in speaking with one of the CDHU workers, they will all want cars as they become less impoverished (as some are already doing).
    - Also, the small groceries and other stores have distributors that come right into the slum to stock the shelves (e.g. was coca-cola);

the small stores don't have trouble getting materials.
- The small shops in the favela are much more expensive than outside, so they will leave to get groceries, etc.

Big Lessons Learned

- Need more sources of income generation, especially sources within the slum
- There exists a huge demand for cars as soon as people can afford them
  - Status
  - Safety
  - Public transit is crowded, time consuming (buses)
- Sewage is one of the most pressing problems in the favela
  - Most people have
    - running water
    - electricity
    - cell phones
    - television
    - some have internet (prevalence and use are increasing, of course)
- Congestion and traffic are the most pressing problems for the city
  - Everyone wants cars
  - Most people travel far for work
  - Most people spend a lot of time traveling due to traffic
  - Buses and trains are packed
- Politics play a huge role in the welfare of the people in the favelas
  - To understand the future of favelas, we must also consider the 10 and 20 year plans of the CDHU
  - State and city governments support most upgrade efforts
  - City has passed a law to ensure continuous commitment to sustainable city goals
    - They have working groups for urban mobility already occurring regularly
- Favelas are located mostly in the periphery and have limited access to public transport

Business Opportunities in General

Leapfrog technology--make sustainable, public transport sexy, fast and safe--reduce the demand for small cars
Problems with imposing post-materialistic society concepts on developing country.
Lots of materials delivered to the slums already as there are many small businesses
e.g. Coca-cola makes sure to get products into the slums, even Santa Isabela
Microcredit opportunities for people in upgraded slums (as they might actually have some collateral), or collectives

Ford needs to be "sitting at the right tables" to understand the direction the government is going relative to public transport and poverty alleviation in order to truly

      Note Ethos Institute working groups on a number of topics

Opportunity exists to reduce the dependence on the car.

      The car is a status symbol, but is not safe, reliable, fast, or clean--there must be opportunities here

      Add value to shared transit/ remove value from individual transit

      Motorcycles as delivery vehicles

            fast, in and out of traffic, efficient

            highly dangerous

APPENDIX N:
Transportation Behavior Change Strategies

Note: The following reports were prepared for a class on the psychology of Environmental Stewardship with team members Gillian Ream, Tyne Hopkins and Tom O'Dowd.

A Model for Changing Mobility Behavior and Effective Interventions

The model identifies behavior variables, and relationships thereof, important to understanding first time use of public transit for a regular (daily or weekly) commute. By including the model building variable, the model also seeks to explain the relationship between a one-time behavior—trying mass transit—and the creation of a durable behavior—regularly using mass transit. The model was conceived first by modeling the variables effecting ones decision to try mass transit (starting with perceived barriers) and then by modifying the model to address the conditions that would make mass transit travel behaviors habitual.

VARIABLES

What follows is an explanation of the variables included in our model. Almost all of these variables are taken from existing behavior change models (some modified or combined) and many have been used to study mobility behavior interventions specifically.

Perceived Barriers: Barriers to using transit are interpreted differently from person to person. For example, a 5 minute walk to a bus stop or transit station, may be perceived differently depending on one's physical fitness. This also includes thoughts that you won't get somewhere on time (versus using your car) you won't be safe (while waiting for or on the bus), etc. This was something obvious we found in our research, which is decided to create a variable that is specific addresses this perception issue. Arguably it could have been inferred in the expectancy and value variable.

Expectancy & Value: Perceived outcomes and how we value those outcomes. This is a rational variable, that is to say, a person will consider the time it takes to travel via public transportation or the personal car and their values associated with the time savings or loss. It assumes people make most rational decision, but in this model it is derived from their perceptions rather than a pure calculation. Through experience of the behavior and model-building, their perception of, say, the amount of time that transit takes, may change.

Attitudes: In our model, attitudes are roughly equal to personal norms. This variable is an influenced by issue knowledge, social norms, and expectancy and values. This is

an important step because, for example, even if expectancy and values about public transportation were such that a person were more likely to use their car to get to work (because of time saved, for example) their attitude might be affected by issue knowledge and the social norms, leading them to take the bus. Personal values were another variable we chose not to include here, as they are represented by the values demonstrated in the expectancy-value variable as well as those derived from social norms.

Issue Knowledge: Different from procedural knowledge or competence, issue knowledge relates to the implications of choosing public transportation versus personal vehicles, including pollution, global warming, fuel use, and congestion as societal issues larger than each person's individual choice. Declarative knowledge seems important to making people aware of the environment, social, normative, and personal problems with cars (e.g. Collins and Chambers, 2005).

Social Norms: A sense of obligation, or ascription of personal responsibility, probably comes from perceived social norms (a.k.a. personal or subjective norms). Norms and a person's perceived "social role" (Bamberg and Schmidt, 2003) and anticipated feelings of guilt (Bamberg, 2007) have been factors in mobility behavior. Social signals may be more important for youth, especially when it comes to driving behaviors.

Mental State: Includes positive emotions and outlook; how happy or sad the person is (Frederickson, 1998) and what their level of mental vitality is, Directed Attention Capacity (e.g. Kaplan and Kaplan, 2003). We recognize that mental state can be affected by several factors outside our model which have been summed up as "situational factors." In the model, it directly impacts intention to act, because people are unlikely to make plans to alter their habitual behavior if they are unhappy or fatigued (Frederickson 1998).

Procedural Competence: This variable encompasses a person's access to the knowledge required to perform the desired behavior. In our case, this includes knowledge about where bus stops are located, when they arrive, and what is needed to ride the bus (fares, tickets, ID), etc. Procedural Knowledge is often part of transportation behavior studies (UK DOT, 2005; Collins and Chambers, 2005). For our purposes we can lump competence (Stern, 2000). Knowledge of Strategies (Hines et al, 1987), and perceived behavioral control (Azjen, 1991) with procedural knowledge. This also includes action skills and self efficacy. This is an important variable and likely a key part of the reason that model-building contributes to strengthening a habitual behavior.

Situational Factors: Some models include "situational factors" (Hines et al, 1987) or "behavioral setting" (Kaplan, 1991) or "facilitating conditions" (Azjen, 1991), but these have not often been considered in mobility behavior research (as far as we can tell). In our model, similar to the Hines model, situational factors appear between intention and action. Additionally, their "learning" impact on perceived barriers helps explain why participants in the Brown, Werner & Kim study (2003) identified far fewer

barriers to public transit after they had tried it a few times. Of course, this feedback is not always positive. The transit environment may be perceived as inviting/comfortable/interesting or confusing/scary/boring and cause stress or peace, affecting mental state.

Intention to Act: An existing intention to change mobility behavior is predictive of actual behavior (Bamberg, 2006; Bachman and Katzev, 1982). Our "intention to act" variable indicates the the step immediately before behavior. It is separated from behavior because there may still be situational factors (e.g. pouring rain, waking up late) that may still keep them from performing the behavior on a given day regardless of intention.

Behavior: The behavior in this case is outlined in the introduction: using public transit in one's commute. Whether choosing transit over driving once or habitually, each of the factors in the model impact one's actual decision and performance of the behavior.

Model Building: in the form of trials or small experiments, is an important factor taken from the Reasonable Person Model (Kaplan and Kaplan 2003). It suggests that if people can explore the transit system at their own pace, they may come to a greater understanding of the transit system and minimize any feelings of helplessness. The model they build of the system may also build their procedural competence and reduce perceived barriers.

Habit vs. Model Building: There may be a case for "habit" being related to model-building. Bamberg and Schmidt (2003) talked about car habit being a barrier to transit use. A hopeful sign came from a Japanese study (Fuji and Garling, 2003) which discussed "script-based choice": drivers who were forced to take public transportation (due to road construction) eventually used public transit more often in the future than those not forced to, indicating that trying public transit once may increase the likelihood that it will be part of their transport repertoire in the future.

Critical, Malleable, and Difficult Variables
While all of the variables in the model help us understand our targeted behavior, there are a few variables that appear to be more influential than others: social norms, perceived barriers, and procedural competence. In our research, we found that norms regarding car ownership and use are very strong in both cities. Cars are a status symbol and means of personal expression in both the US and Brazil. Even when mass transit is an option, people may be resistant to using it and to expending the mental energy necessary to understand it. Thus, mental vitality (part of mental state in this model) and building procedural competence are obviously critical to using mass transit. Finally, habitual usage of mass transit systems requires that the first ridership experience breeds stronger procedural competence of the system. The model building variable is important here, as is feedback from situational factors experienced while using transit.

The most critical variables are not always the easiest to manipulate. The variables that we found to be easily manipulated include: knowledge of the issues, procedural competence, perceived barriers and model building. Knowledge of issues and procedural competence can both be influenced by information interventions. Perceived barriers can also be manipulated by information sharing. Conversely, social norms play a great role in shaping our attitudes towards using mass transit but they are very difficult to influence. There are interventions that can definitely influence social norms however, given the scale of the intervention and the multitude of factors that reinforce the social norm that promotes personal car use.

INTERVENTIONS

When looking into changing transit behavior, there is often a focus on "hard" policies (infrastructure changes, etc.), but cities may have success encouraging transit ridership through "soft" policies like communication and education as well (UK DOT, 2005). These changes typically cost less than overhauling infrastructure, but have the potential to be as effective. Traditional interventions have centered around information and incentives, but a variety of other programs are beginning to emerge that address other types of motivation like those described in the model.

Information & Incentives Interventions: Many programs have used informational/educational strategies to increase knowledge and awareness (UK DOT 2005). The assumption is that information is the only barrier, so many programs use education, communication, and traditional marketing techniques to encourage people to change transit behavior (see Vancouver's Way To Go, and the UK's The Big Wheel campaign, and Go Boulder). Personalized communication was shown to be effective, including personalized transit schedules (The Big Wheel, Bamberg 2006). Combining informational interventions with a "free trial" pass tended to show additional success (UK DOT 2005, Bamberg 2006), perhaps because they reduced the perceived barrier of cost in addition to providing essential information. Even with free passes, however, changes in transit behavior were still most common among those that had existing positive attitudes toward transit use (Bamberg 2006), indicating a need for more thorough intervention schemes.

Perceived Barrier Interventions: This addresses perceived barriers to transit, from cost to timeliness to standing-in-the-rain-waiting-for-a-late-bus-a-phobia. The Go Boulder program used interventions that were intended to increased the ease of using transit, such as transit passes distributed to entire workplaces, schools, and neighborhoods and guaranteed taxi rides home for workplace pass holders needing to stay late at work or who have an emergency (Go Boulder Case Study). The Fort Collins area program used the guaranteed ride home, commuter tax-benefits (working with employers), bikes on buses, and a Savings Calculator online (Fort Collins Case Study).

It may also be effective to tout other benefits of using transit. Brown et. al. found that transit riders relish the ability to do other things while riding public transit (such as talk, read the paper, sightsee, etc.), which can reinforce one's enjoyment of transit and help the use become habitual (Brown, Werner & Kim 2003). Brown went on to note that perceived barriers of using lite rail were far lower than that of busses, in part because of clean stations, smoother movements, and more timely routes (2003), so making busses more comfortable may increase ridership. The recent success of public transit routes that provide Wi-Fi, TVs, etc. by companies like Greyhound and Megabus, make sense within this context, and providing those or other amenities seems wise if transit is to attract more daily commuters.

Value and Norm Interventions: Though outside the realm of traditional transit interventions, programs that target social or personal norms have also worked for various cities. This is particularly important in São Paolo, where cars are strongly associated with status, as well as within the car culture context of Detroit. The work of Brown et al (2003) suggests extolling both the personal and societal benefits of public transit to affect people with different value systems. Educating groups of people about the value of transit through ecoteam workbooks (Gershon & Gilman, 1991) or educational toolkits (Way to Go!) may also be effective, although participants in these cases have had other forces changing their behavior (pre-exisiting motivation or grade motivation, respectively).
Building on this theme, social support (a la Lewin, 1952) may help people change their mobility behavior (Gershon & Gilman, 1991), although participants in this study tended to be highly motivated pro-environmental people, leading to questions about generalizability. This may also have a part in social norms, though will vary between situations and communities.

Feedback Interventions: Providing direct feedback is not explicitly included in our model because it is difficult to address in transit situations. Feedback mechanisms like high-profile monthly reminders in newspaper articles and public access programs seemed to work in the Boulder case (Go Boulder). It is also conceivable that a city could set goals for transit, car use, or carbon emissions, and broadcast progress on these goals to its citizens. Planners should be careful, however, because Tertoolen et al (1998) found that feedback can lead to reactance. When providing feedback on voluntary activities, it is important to heed Frederickson's (1998) research on the value of associating a behavior with positive emotions. In our model, feedback is addressed more on an individual basis, as the experience of the transit situation impacts one's mental map, percieved barriers, and in turn their expectancy and value of using transit. It is assumed that by making the transit experience positive, people will be more likely to try it again (Bamberg 2006). As feedback mechanisms are unlikely to directly address individual motivations, the usefulness of situational factors may be more effective than mass communication campaigns.

Model Building Interventions: Environments (physical and perceived) that allow people to learn at their own pace help them to build models, and therefore feel more comfortable. Interventions that get people to try transit may help people feel

comfortable commuting without a car. These may include free trials (Bamberg, 2006), or free tickets, which are apparently most effective when information comes with the free ticket somehow (UK DOT, 2005) People who were forced to take public transit (Fuji and Garling, 2003) supported what might be called the "you try it, you buy it" factor, which is consistent with other research about the effectiveness of small experiments in learning. The US DOT suggests we "modulate the demand for travel in a way that is based on choices (mode, time, route, etc.)" The DOT quotes a good example from OECD (2002): the I-15 FasTrak program in San Diego, "which allows solo drivers to pay to use the HOV lanes and allows those sharing a ride to use the lanes for free, but does not force a fee on any driver or require anyone to use a particular facility (OECD, 2002)" (US DOT). This might be more of a policy/planning change rather than a behavior intervention, but it's worth noting that the DOT recognizes that commuters value choices.

Case Study: Go Boulder

The Go Boulder project in Boulder, CO was a great example of using multiple interventions to facilitate transportation behavior change.   They made many attempts to influence social norms by , involving community leaders in the design process, offering various organizations, discount plans and hosting city wide events featuring mass transit. The city also made a formal commitment to change mobility behavior - cut 15 percent of the ridership in 1989 by 2010. The city wide events also served to increase procedural knowledge and issue awareness. Community newspapers and websites were used to provide biweekly, informational feedback like ridership statistics to the community. (Go Boulder Case Study)

Conclusion

Just as there are a variety of variables that impact a given behavior, there are a vareity of interventions that could be effective. The most effective interventions will address multiple variables, simultaneously creating interest and knowledge about using public transit and reinforcing transit using behavior through changing social norms and creating conditions where people can build models and continuously learn new ways of more sustainable mobility.

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From Behind the Wheel: Using Psychology to Promote Public Transportation

Final Proposal and Evaluation
for
Dr. Ray DeYoung. NRE 561.
Tyne Hopkins, Tom O'Dowd, Emily Plews, Gillian Ream, Alexandra Wilson

Summary

As we barrel toward a world that is both increasingly connected and increasingly carbon-constrained mobility, the expectation of unlimited personal mobility must be called into question. Cities and regions throughout the world have long recognized the benefits of public transit, whether it be limiting traffic congestion and parking demand or lowering auto emissions and their associated human and environmental health impacts. Time and again, however, cities have struggled with how to convince citizens to make public transit part of their everyday routine. In planning for transit, cities often get caught in the "chicken-and-egg" problem of whether to build new routes and infrastructure and where. While convenience would increase with wider service and more frequent routes, a transit authority needs a base level of ridership to support additional infrastructure. Rather than planning for expensive additional infrastructure, this study focuses on behavioral interventions to increase ridership. Only by finding ways to build in transit as part of the daily routine of more individuals can a city hope to create a societal shift toward public transit use.

This project will examine likely transit behaviors and possible interventions in two communities that will soon have access to public transit: Pantanal, a slum neighborhood in São Paulo, Brazil, and the Fox Creek residential development in Detroit, Michigan. Both areas exhibit a strong culture around car ownership and social norms against public transit. Individual residents may face additional barriers to using transit, including perceived barriers like cost, convenience and safety, or lack of competence, causing people to feel overwhelmed by the task of figuring out what transit schedule might work for them. As impoverished areas—such as Pantanal—demonstrate the potential for economic growth, both communities could benefit deeply from the economic and environmental benefits transit provides. Our intervention and model are focused on a single behavior: getting people to try public transit once for their commute to work. Using transit one time is evidence that transit has become part of a person's repertoire of commuting options, and as we will explain, we foresee this first attempt as having strong repercussions in both personal behavior and social norms surrounding transit.

Explanation of Intervention

When looking into changing transit behavior, there is often a focus on "hard" policies (infrastructure changes, etc.), but cities may have success encouraging transit ridership through "soft" policies like communication and education as well (UK DOT, 2005). Our strategy to change transportation behavior focuses on reducing barriers and raising the social value of transit use through group identity. The transit organization in question would offer group discounts for an organization, such as a

company, church, or school, to purchase either one-time coupons or monthly or annual passes for their members. Accompanying the passes would be the provision of cab fares for special circumstances. The passes would have the name of the organization on them, increasing group identity and social norms associated with transit. The distribution of these passes would coincide with a promotional "kick off" event, which would be aimed at raising individual awareness and group pride in their investment in transit. The event would also be an opportunity to educate people, both introducing them to the issues surrounding public transit as well as making it clear how they could be using transit to ease their daily commute. Through these group-based methods, we hope to change the social norms toward favoring public transit while also diminishing the perceived barrier of transit cost or stigma and adding to issue knowledge and procedural competence through the transit events, all at a far lower cost than adding infrastructure.

Implementing the intervention would begin with the transit authority reaching out to and working closely with influential local groups including businesses, religious organizations, schools, and neighborhood associations. Organizations would be asked to become part of an effort to promote transit by offering transit coupons or passes to their employees, students, or members. The organization would purchase the passes at a discounted rate, and the purchase of passes would include an employee or member "kick-off" event. Though many organizations would likely be interested in this program from the start, transit authorities could also attract businesses to the program through low introductory rates, discounted bus advertising, or even municipal tax incentives for companies with high employee ridership. By working with existing groups, the intervention begins with both an existing base of support from companies and a social framework through which to encourage behavior change.

The "kick off" event is a major component of the intervention as it is intended to establish the organization's commitment to public transit use. It would be offered as a bonus to organizations that sign up for the group pass program. The event would take place in a context that is convenient for members of the organization, like a lunchtime program at a business or an after-church event, yet would be optional for members to attend so as not to trigger reactance. Ideally, the event would also be held outdoors and begin with a relaxed social event like a picnic, which would allow participants to restore their mental vitality and be in a more positive emotional state, placing them in an improved mental and emotional position to begin to incorporate transit into their mental models of commuter behavior (Kaplan and Kaplan 2003, Frederickson 1998).

Attending the event would be a representative from the public transit system able to answer questions and to provide information. The public transit (PT) official would present to the group information on how to use the various transit methods— what stops are nearby, where to access the schedule, the time length of the potential commute, for example—tailored to that specific group's location and needs. During the presentation of information, the PT representative could tell a story to convey some of the benefits of using public transit. He or she could describe a person's typical commute—what they do during the ride that they couldn't do in a car, like read, talk to neighbors or on the cell phone, or put on make-up, what they *aren't*

doing (e.g. using their own gas money), how long it takes, and how much they save daily, monthly, and yearly. The PT representative would also be able to distribute free "ride with a buddy" coupons at the event and ask for the participants to sign a commitment to use public transportation *once* in the coming month.

After the initial "kick off" event, information about public transit could be part of the church bulletin, for example, and reminders could be given during the announcements made at services. They could be tied in by highlighting times when the bus stops at the church. Similarly information could be available at businesses and discussed during meetings, again highlighting relevant stops and schedules. These actions help to reinforce the initial intervention.

Intervention Variables

We have addressed/targeted the following variables in our intervention: procedural competence, social norms, perceived barriers (time, cost and ease of use), as well as the concept of using multiple interventions. To increase procedural knowledge, personalized communication was shown to be effective, including personalized transit schedules (The Big Wheel, Bamberg 2006). Combining informational interventions with a "free trial" pass tended to show additional success (UK DOT 2005, Bamberg 2006), perhaps because they reduced the perceived barrier of cost in addition to providing essential information. Even with free passes, however, changes in transit behavior were still most common among those that had existing positive attitudes toward transit use (Bamberg 2006), which is why we intentionally included implementation steps to encourage positive emotions during the intervention. Public transportation schedules and maps should be widely available, for example at business, schools, grocery and drug stores, etc.

When considering social norms, the work of Brown et al (2003) suggests extolling both the personal and societal benefits of public transit to affect people with different value systems. Educating groups of people about the value of transit through ecoteam workbooks (Gershon & Gilman, 1991) or educational toolkits (Way to Go!) and social support (a la Lewin, 1952) may also be effective and help people change their behavior, although participants in these cases have had other forces changing their behavior (pre-existing motivation or grade motivation, respectively) and tended to be highly motivated pro-environmental people, leading to questions about generalizability. This may also have a part in social norms, though will vary between situations and communities. By encouraging outside organizations to partner/participate with the public transportation system, the social norm can be influenced, (i.e. "My co-worker takes the bus, maybe I should too.")

The "bring your buddy on the bus" idea covers several of the variables we are addressing. It influences the social norm- the person knows someone, a friend, who rides the bus; procedural competence- the friend can help to show them where the stop is, familiarize them with the schedule, etc; and most importantly, it gets the person on the bus that first time.

Addressing the perceived barrier of time, Brown et al. found that transit riders relish the ability to do other things while riding public transit (such as talk, read the paper, sight see, etc.), which can reinforce one's enjoyment of transit and help the use become habitual (Brown, Werner & Kim 2003). Items such as this

should be mentioned during the kick off event. ("feel like you never get a chance to read the paper, take the bus and enjoy your morning commute!") Another useful tool might be a list of estimated route times, i.e. if you live in this area, and want to go to this plaza it will be approximately 25 minutes. Guaranteed taxi rides home for workplace pass holders needing to stay late at work or who have an emergency (Go Boulder Case Study) would help with the perceived barrier of use. To eliminate the perceived barrier of cost, we have considered ideas such as include free trials (Bamberg, 2006), or free tickets, which are apparently most effective when information comes with the free ticket somehow (UK DOT, 2005). The US DOT suggests we "modulate the demand for travel in a way that is based on choices (mode, time, route, etc.)"

       MULTIPLE INTERVENTIONS: The Go Boulder project in Boulder, CO was a great example of using multiple interventions to facilitate transportation behavior change. They made many attempts to influence social norms by involving community leaders in the design process, offering various organizations discount plans and hosting city wide events featuring mass transit. The city also made a formal commitment to change mobility behavior - cut 15 percent of the ridership in 1989 by 2010. The city wide events also served to increase procedural knowledge and issue awareness. Community newspapers and websites were used to provide biweekly, informational feedback like ridership statistics to the community. (Go Boulder Case Study)

OUTCOMES
       We designed the elements of the intervention with both short term and long term outcomes in mind.   The desired outcomes from the "kick-off" event include: understanding how to use public transit for their regular commute, decreased barriers, feeling commitment to try public transit, and increased awareness of the benefits of public transit.

• Participants will have had a discussion with their friends, colleagues during the event to set up a time to use their "free buddy pass"
• Participants will start using transit more regularly and pressure their employers/organizations to continue with the program. This will generate revenue that will help make transit continually more accessible, popular, and convenient.

Intervention Analysis

Reliability and Speed of Change:
       Many of the extrinsically-motivating aspects of our program (free trials, etc.) seem to have a rapid effect. Also, many aspects have proven reliable in previous studies. For example, commitment, free tickets, and a combination of both, were each significantly more effective than no treatment (Bachman and Katzev, 1982). Bamberg and Schmidt (2003) note the particular ability of commitments to break down the habit of environmental behaviors like car use (although habit will likely be one of the biggest hindrances to reliability). Group programs have been effective: the University of Washington's U-Pass program resulted in a 33% reduction in parking permits

purchased (US DOT), and an employer-based program in Ann Arbor saw a 9% increase in ridership (White, 2002). Thus financial incentives coming through an employer (a bonus of convenience) seem to be reliable.

Bamberg (2006) found a similar effect with free tickets combined with personalized procedural information. Thus, the combination effect of the different pieces of our intervention seems likely to be effective. In short "packaged, complementary solutions are usually more effective than a single measure" (OECD, 2002, as quoted in US DOT). However, perhaps ours is too complicated and thus hard to implement. Staats et al (2004) note that the Eco Team approach is complicated, and wonders if "a leaner instrument" could be implemented and retain the same effectiveness. Perhaps the commuting buddy aspect of our intervention fits this bill. One thing to beware with some aspects of our intervention is that Tertoolen, et al (1998), found "psychological resistance" (what we would call reactance) resulting from transit-related interventions (self-monitoring, feedback, financial feedback, commitment) which indicates that it is easy to be too heavy-handed with transit-related interventions, which we might have been.

Particularism:

There is the potential that the interventions we have chosen are only applicable to certain groups. After all, case studies and research on programs like ours seem to work best with very specific kinds of people or organizations: highly motivated, pro-environmental people (Staats, 2004), businesses with more than 25 employees (White, 2002), or college students (e.g. Wall et al, 2007). Plus our intervention could be flawed by limiting our program to attendees at a kick-off event, members of particular organizations rather than a whole community, and by assuming sufficient public transit infrastructure and policy. However, our interventions attempt to address a number of the different values people have (e.g. pro-self, pro-social, and pro-environment) by appealing to their pocketbooks and psyches, social norms, and, to a limited degree, their understanding of the impact on the environment. Also, in the Fox Creek Development, the strategy of targeting people who have recently moved may be seen as particular to the situation, but can be used more broadly with a wide variety of populations undergoing some sort of significant life change (Bamberg, 2006). However, Wall et al (2009) suggest, based on their "Commuting-Mode Choice" study, that "any behavior change policy implemented in a particular setting should ideally be based on research carried out in that (or a very similar) setting." This conclusion legitimizes our projects focus on particular populations, but perhaps de-legitimizes our group's prescription of one broad treatment for two quite-different populations.

Generalizability:

Some aspects of our intervention have the ability to "spill-over" to other people and/or other behaviors, while some are limited to our one targeted behavior. For instance, participating in our kick-off event will greatly enhance procedural knowledge for, say, bus use, but will not directly help with using bike lanes or car-sharing. However, such an event might be joyful enough that people might be able to "broaden-and-build" their knowledge of multiple alternatives to the automobile and

the interpersonal network necessary to be supported in transit experimentation (a la Frederickson, 1998). Signs of hope came out of the Clean Air Commute program in Canada, where behavior change was able to "carry over" to people living near study participants (Tools of Change, 2005). Perhaps the pilot group became "change agents". Also, the pilot group itself was able to generalize to other behaviors—they extended the targeted commute -related behavior change to non-work travel behaviors such as grocery shopping! Still the Clean Air Commute program, and other employer/group-based programs, might be more like the Eco-Teams approach, in that it addressed multiple behaviors. Such a wide-reaching programs "strongly reduces the generalization problem" (Staats, 2004). Unfortunately, our intervention targets only one behavior, a feature that may make broader behavior change more difficult.

Durability:

Programs like ours (with multiple intervention components like commitment, deals on prices, etc.), are usually significantly more effective than no-treatment groups, even after follow-up periods (e.g. Bachman and Katzev, 1982). Go Boulder (the poster child for such programs) was successful in increasing overall transit trips by only 1.7%, but was apparently incredibly successful with the employer-based ECO Pass program, through which employee ridership increased, depending on the employer, anywhere from 59% to 400% (Tools of Change, 2005)! Taking place six months after a baseline study, this gives hope of the durability of employer-based programs. Also, ridership at the University of Colorado increased more than three-fold in the first year. Nortel Network's GreenCommute program resulted in a 20% increase in alternative modes of transportation after a year. This was an employer-initiated project, but shows that on-going big events can create a fun (and norm-promoting) atmosphere for encouraging ridership (Tools of Change, 2005).

Despite these positive findings, it is important to note that our program focuses on a one-time, try-it-out event, rather than a continuous program of rewards, feedbacks, follow-ups, extra perks, and the like. Still, in cases where people try out public transit (e.g. by necessity because of a highway construction project), they may add it to their repertoire permanently (Fuji and Garling, 2003). This is reminiscent of the "foot-in-the-door" technique (e.g. Freedman and Fraser, 1999) and follows peoples' need to explore their world (e.g. Kaplan and Kaplan, 2003), (a topic that shows up below in our discussion of well-being). Related is the need for multiple methods within an intervention (De Young, 2006 cited in Staats, 2004), which our program tries to meet on one day, which is good, but not enough to make it an extremely durable program.

The use of commitment in various forms (buddy program, signed document, etc.) will probably lead to more durability (Staats, 2004). So will a positive experience like a kick-off day (Bamberg, 2006, Frederickson, 1998), as long as the participants' experimentation with riding the bus is not a negative experience (Monroe and Kaplan, 1998).

Missing variables:

We do not do much to address issue knowledge—say, the effect of cars on the environment—because we felt that social norms and perceived barriers were the two most important factors in making transit decisions. This has the potential to limit our

intervention to only pro-self people, while pro-environmental values do play a role in transit choice for some. Socio-demographic variables and status are two variables that we did not study, that Wall et al (2009) also omitted, despite their apparent importance in other research. Perceived Control on environmental problems seems to be quite important (Bamberg and Schmidt, 2003), though we do not address it quite directly (we focus more on the competence components of perceived *behavioral* control, not on control over environmental problems as a whole).

Well-being:
        This quote from the Tools of Change (2005) GO Boulder page is quite telling: "The return on investment has not been measured in terms of dollars. However, Go Boulder's significant contribution to making Boulder a better place to live has resulted in high interest from corporations to set up business in the area" (Tools of Change, 2005). The presumption is that GO Boulder contributed to the quality of life in Boulder. Perhaps factors that come from interventions like ours, such as pride, reduced commuting stress, and an ability to socialize on the way to work, contribute to that quality. Brown et al (2003) note the positive effects of "pleasant and productive" activities during transit—perhaps they make the experience more attractive and more conducive to mental vitality. Perhaps the chance to increase competence with the bus system also leads to satisfaction with the transit experience. The UK Department of Transportation discusses how ticket promotions stimulate "man-the-scientist"—in other words, the exploratory nature of trying something new (UK DOT, 2005).

Conclusion:
        Like any intervention, ours is an experiment that has flaws. However, we believe that our hypothetical program addresses the various psychological needs of people to make a noticeable impact on an incredibly important environmental problem of our times: the struggle for sustainable transport. The image of a group of people, working together to learn and explore a new transit system, like it was a game or a puzzle, while feeling competent, restored, and meaningful is a beautiful image indeed!

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