Respectfully Formalizing the Informal

Holistic Strategies for Integrating and Integrative Mobility For Urban Areas of the Global South

Arnd N. Bätzner
MSc ETH, cand. Ph.D. University of St.Gallen
/// Scales of Mobility: Brief Historical Overview:
What happened in the Global South?

/// Zona Norte / Zona Sul: The Case of Rio de Janeiro
/// Mafia de Ônibus
/// Bondinho de Santa Teresa
/// Informal Transport: Kômbis and Vans

/// The Formal and the Informal: Tough to Grasp
/// Ropeway Transportation as a Mode of Formalizing
/// Inputs for Discussion and Further Research
Scales of Mobility: Brief Historical Overview
The Development of Personal Mobility

Key Objectives

Illustrate the evolution that personal mobility has taken over time, linking it to the economic and social frame of the respective age.

Identify the point where a paradigm shift did or did not take place in the Global South.

Set the base for understanding the role of informal mobility.
The Age of Gatherers and Hunters

- Communities of up to 150 people
- No personal mobility as we would define it today
- Movements of a person inside a confined space around point of residence
- Motivation: Alimentation and Defense

Daily Range: up to 5 km
Early typologies of long-distance travel emerge

New motivations: Messenging, Scientific Curiosity (Goethe)

Daily Range:  
- up to 60 km (horse)  
- up to 100 km (coach)
The Industrial Age

Gradual phasing-out of horse-drawn carriages from long-distance travel
Emergence of mass transportation: Steamers, Railways
Daily Range: up to 500 km

1882: Opening of the St.Gotthard Railway revolutionizes the perception of travel on European Continent: Introduction of a new time scale
The Industrial Age (2)

Rapid growth of cities through rural exodus
Slums and suburbs develop
Administrative growth of cities through annexation and incorporation
1894: Zurich introduces electric trams (privately financed) to connect suburbs. Workers start to use bicycles and public transportation to reach factories

Literature: Emile Zola: Les Rougon-Macquart - Histoire naturelle et sociale d'une famille sous le Second Empire (1871 - 1893), 20 novels
New Drivers for Personal Mobility

Emigration from Europe to the Americas
Emergence of modern Tourism through British Pioneers (summer tourism, then from approx. 1920 on also winter tourism)

Deterministic aspects of changes in personal mobility:
- from personal mobility as essential necessity for survival
- to personal mobility as an economic necessity
- to personal mobility as a socially motivated commodity
Post WW II: The Age of Jet Air Travel


Comparison of Scales:
- Cruising speed of a DC-3: 270 km/h
- Cruising speed of a DC-8: 780 km/h
- 1955: A slightly modified classic train reaches 331 km/h in France (SNCF)
Technical progress in the means of transportation is mirrored in the daily distance that a man could travel:

<table>
<thead>
<tr>
<th>Period</th>
<th>Reference Distance</th>
<th>Maximum Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Ages</td>
<td>5 km</td>
<td>5 km</td>
</tr>
<tr>
<td>Medieval Times</td>
<td>10 km</td>
<td>50 km</td>
</tr>
<tr>
<td>Age of Enlightenment</td>
<td>10 km</td>
<td>50 - 100 km</td>
</tr>
<tr>
<td>Age of Industrialization</td>
<td>10 km</td>
<td>500 km</td>
</tr>
<tr>
<td>1930s</td>
<td>10 km</td>
<td>500 km</td>
</tr>
<tr>
<td>1960s</td>
<td>50 km</td>
<td>5000 km</td>
</tr>
<tr>
<td>2000s</td>
<td>50 km</td>
<td>17000 km (SIN-JFK)</td>
</tr>
</tbody>
</table>

Simultaneously, a dramatic decrease in the cost of travel is observed. This phenomenon continues to date, with low-cost air travel currently showing enormous growth rates in developing countries (e.g. India). This sets economic standards for the industry and is only reversible on a regulatory level. Emergence of the Easyjetset (Tobias Rapp), 2000s
...and in the Global South?

Avg Daily Distance of a Man in 2012

<table>
<thead>
<tr>
<th>Era</th>
<th>Reference Distance</th>
<th>Maximum Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Ages</td>
<td>5 km</td>
<td>5 km</td>
</tr>
<tr>
<td>Medieval Times</td>
<td>10 km</td>
<td>50 km</td>
</tr>
<tr>
<td>Age of Enlightenment</td>
<td>10 km</td>
<td>50 - 100 km</td>
</tr>
</tbody>
</table>

In many cities of the global South, a Man’s average daily „reach“ has stalled at the level where it was centuries ago in other parts of the World.

This is a phenomenon closely linked to the  
- existence  
- pre-dominance  
of informal over formal transport
/// Zona Norte, Zona Sul: A Look at Rio de Janeiro ////

/// Key Objectives

/// Taking the Example to illustrate where and how Formal Transports Failed (partly or entirely)

/// Understand why Informal Transports can’t just be „shut down“

/// Take close look at FORMAL transport to understand what role INFORMAL transport plays
Baixada Fluminense Rail Network
\\\\ „Serving“ the Baixada Fluminense \\\\\\\\\n
/// Baixada Fluminense: Northeastern Area of Estado do RJ, > 3M inhabitants
Rail network 252 km

<table>
<thead>
<tr>
<th>Operator</th>
<th>Years</th>
<th>Pax / Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFCB: Estrado de Ferro Central do Brasil</td>
<td>1858-1957</td>
<td></td>
</tr>
<tr>
<td>RFFSA: Rede Ferroviário Federal S.A.</td>
<td>1957-1984</td>
<td>1’000‘000</td>
</tr>
<tr>
<td>CBTU: Companhia Brasileira dos Trens Urbanos</td>
<td>1984-1994</td>
<td>165‘000</td>
</tr>
<tr>
<td>Flumitrens</td>
<td>1994-1999</td>
<td>145‘000</td>
</tr>
<tr>
<td>SuperVia</td>
<td>1999-2024</td>
<td>450‘000</td>
</tr>
</tbody>
</table>

/// Serving the Baixada Fluminense ///
1967: Construction and Duplication of Highway Rio - São Paulo
Passenger Rail Transportation is officially no longer government priority

Priority to Road Transport 1969-1995, operated by private companies

Lack of Investment and Maintenance:
Severe implications on Service Quality and Reliability
2012: New Trains - 2 Years Late...
...and Mind the Gap! /////

Trem chinês chega ao Rio com vão mais largo entre vagão e plataforma

SuperVia diz que estações serão adequadas à altura e largura das composições

O Globo, March 21st 2012
Building Metrô Linha 1

1967: Last Rio Tram in Standard Gauge (1‘600 mm) closed down
1968: New Urban Transport Master Plan relying on Bus & Metrô
1968: Companhia do Metrô de Rio de Janeiro created by State Law
1970: Work starts in Glória
1971-1974: Works stopped due to lack of funds
1979: Operation begins (5 Stations in Center), 9 AM - 3 PM, 4-car trains
1998: Copacabana
2002: Siqueira Campos
2007: Cantagalo
2009: General Osorio

Heavy Rail Car Ops.
///// Building Metrô Linha 1 (2) /////


///// Obras Cantagalo Stn (2005) /////
1968: Master Plan: Light Rail planned along Av. Automóvel Clube (Maria da Graça - Pavuna) along abandoned Rio d‘Ouro Railway built in 1870 for laying pipelines to bring water to the city = historic definition of logistical axis

1976: Beginning of Construction, Light Rail with overhead wires

1977: Series of 68 Light Rail Vehicles ordered (BN, Cobrasma), Tech Transfer

1982: Operation begins (Estácio-Maracana), 2-car trains „Pre-Metro“
/// 1983 Opening Marcana - Maria da Graça with 3rd rail power
/// 1984 Opening Maria da Graça - Irajá with overhead wire power
/// Problem 1:  LRV doors for low platforms > doors rebuilt
/// Problem 2:  LRVs do only have overhead power > add 3rd rail pickup
/// Problem 3:  Operational Nightmare
/// Problem 4:  LRVs run 22km overground, w/o aircon
/// Problem 5:  Overhead wires stolen during operational breaks (copper)
/// Problem 6:  Pipeline breaks in November 1985 > Operations stopped

/// /// Building Metrô Linha 2 (2) /////

R7: Metrô do Rio tem atrasos e superlotação
Durante 2 semanas, reportagem testou as linhas 1 e 2 em horário de pico.
Passenger Rail in Rio: Metrô, Trem Suburbano & Tram (2005)

Biggest Problem: Linha 2 runs parallel to suburban trains!
\\\\ Metrô Extension Project \\\\\n
\\\ Pax / Day (FY 2010): Metrô Rio L1+L2 (47 km) 580 k
SuperVia (252 km) 450 k

\\ Planned Metrô Extension to Barra de Tijuca: Urgently Needed!
Extending the Metro by Bus in places where it doesn’t run

Tariff integration (Transfer, today smart card)
2012: Towards a Tariff Community

Bilhete Unico (2012) covers Ônibus, Barcas, Metrô, Trem
Tarifa Intermunicipal
Electronic Vale de Transporte > Less Fraud?

>> IDEA: Take Demand Away from Informal Transport!
///// Rio Ônibus /////
Brazil is the largest producer of buses in the world

Rio de Janeiro: 47 Bus Operators run a fleet of 8,800 Buses (comparison - Zurich: 181 + 78 Trolleys)

Private Companies bid for line operation and operate buses on behalf of the City of Rio de Janeiro / other municipalities
Problem 1: Highly informal despite regulatory framework

Problem 2: Frequent Accidents („...motoristas de ônibus pensam que são pilotas de Formula 1“)
> incentivized by Bonus according to # trips/shift

Problem 3: Big Business. Strong Lobby Groups operate to keep rail transport out of business wherever possible

Problem 4: Only 23% accessible (Truck Chassis, R$ 100k / pc)
Problem 5: Only 14% have aircon
/////// Transit Bus (Trucks?) Types in Rio de Janeiro /////

/// Executivo /// Urbano com ar /// Urbano sem ar

/// Integração Metrô /// Integração Supervia /// Kômbi = Informal
Safety and Usability Issues, Mafia do Ônibus, Drug Dealers, Road Safety
///// Ônibus 174 Movie /////

/// July 2000, Zona Sul
/// 2002 (movie)
Bus Rapid Transit (BRT) being phased in

20 years after Curitiba
> Governance, Policy-Making!
> Shape Transportation Structures
and offers to an enormous extent
And the Tram?
1967: Last regular Tram runs in Rio

„Bonde“ = Tram
„Bondinho“ = Small Tram
Historic Parallel: „The Great American Streetcar Scandal“

N.B.: Historical Comparison - Extinction of Interurban and Urban US Networks

1930: 90% of US Population Relies on Public Transportation

1946: NCL controls 80% of urban and suburban rail networks (owned by GM)
Two Accidents in 2011, total 6 dead + 55 injured
Investigação: „23 defeitos graves“
Santa Teresa Citizens’ Mvmt: Romanticizing is not the Solution

Official Invitation by the People of Santa Tereza to funeral service

Separate Transportation Need Analysis from Business Interests (here: touristic)
Old-School stuff goes with Old-School Safety!
≠ This is Urban Public Transport, not a Disneyland Attraction!

It is a Matter of Dignity to offer
- Safe and Decent
- User-Abiding and User-Respecting
- Integrating and Integrative

solutions for Urban Transportation!

>> Cannot be achieved by formal Transportation alone
>> Formalized Modes of Informal Transportation need to play a Role

>> The Challenge is a Formalization maintaining the Strengths and coping with the Weaknesses of Informal Transportation Offers
\\\\ Kômbis and Vans: The Formal Informal  \\
\\\\
(the good, the bad and the ugly)
Volkswagen Kômbi: 50 years and counting

Volkswagen do Brasil, São Bernardo do Campo (SP): still producing approx. 15‘000 units per year

Kômbi: Price R$ 38‘000
Fiat Ducato Price R$ 78‘000
Volkswagen Kômbi: a vehicle creates its own mode

„Transportes Piratas“ > Put Bus Line Number in Windscreen and pick up Passengers anywhere

Due to Quality Flaws in Formal Transport: Used by all Social Classes (not only „transport for the poor“)

Unclear Level of User Safety (unlawful driving, reported assaults on passengers)
Kômbis: Half-Formalization in 2007

/// 7‘000 municipal concessions requiring minimal standards
/// tied to fixed lines or zones
/// enforced by Police
Vans: Kômbi‘s Tall Brother

/// Fiat Ducato and (new) Mercedes Sprinter Vans
/// mostly with a/c
/// catering to same old problems (lack of formal transport) on „posh“ level
Just take them out?

/// 40,000 persons directly or indirectly employed by Vans and Kômbis
/// MDTA (Movimento em Defeso do Transporte Alternativo) = interest group
/// BRS financed with public money (NOT bus companies) > call for employment of former Kômbi and Van operators > Social Issue!
Formal, Informal: Is a Classification Possible?
What is Formal Transportation?

/// Regular Intercity Bus, Afghanistan 2011
/// German Definition (2012)

„Regular Scheduled Transportation ist one that [...] operates at least on 180 days of a Timetable Year“

(Deutsche Bahn AG)
Formal = Paint Scheme?

Licensed Route Taxis, Addis Ababa 2012: Blending Formal and Informal
Formal = Safe?

/// Taxi Collision, Addis Ababa 2012: Safety Issues as part of Informal Transport
Formal = Road substitutes Road? 

Up in the Air Alternative: MetroCable, Medellín 2012
Cable Car replaces Minibuses, slashes travel times from 80 mins to 6 mins
The idea is not new!

Formal = Requiring Vehicles?

New Uses for Established Technology: Escalator, Medellín, 2011
Based on the insight that the more dense a zone is populated or the higher its economic activity, further capacity increase can no longer be the reaction: Which is

- the socially acceptable amount of individual mobility
- its ecological footprint
- the way to internalize the socially relevant part of its external costs

The last point has since become a dominant issue in the assessment of mobility. This is to be considered a paradigm shift and starting point for analyzing the formalization of the informal.
Starting Points for a Discussion

Research now focuses on finding solutions for

> reversing imposed lifestyle issues resulting from an enormous rise of unsustainability in all ares driven by the absence of urban and regional planning processes back in the 1950s

> the unwanted set of side effects such as urban sprawl, the decay of downtown areas and retail structures forcing citizens into vehicle ownership that generate tremendous external costs for society

> How does informal transport foster, accelerate, support, prevent these phenomena?
Imposing a reasoning of the meaning and the consequences of any trip before starting out raises the question of the legitimacy of a given type of individual mobility, defined by:

- its trigger
- its trace in space-time
- the means used
- any physical or abstract matter consumed
- its social and economic implications
IMPORTANT NOTE

/// Use of this talk for academic and teaching purposes only
/// Pictures and Illustrations shown are taken from various resources. The rights entirely remain with their respective authors.
/// For questions, please contact the author <arnd@baetzner.ch>