



# Off-Hour Deliveries in the City of São Paulo: Perception of Drivers and Retailers

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# Outline



- Introduction
- The São Paulo Off Hours Delivery (OHD) Pilot
- Method
- Results

# INTRODUCTION



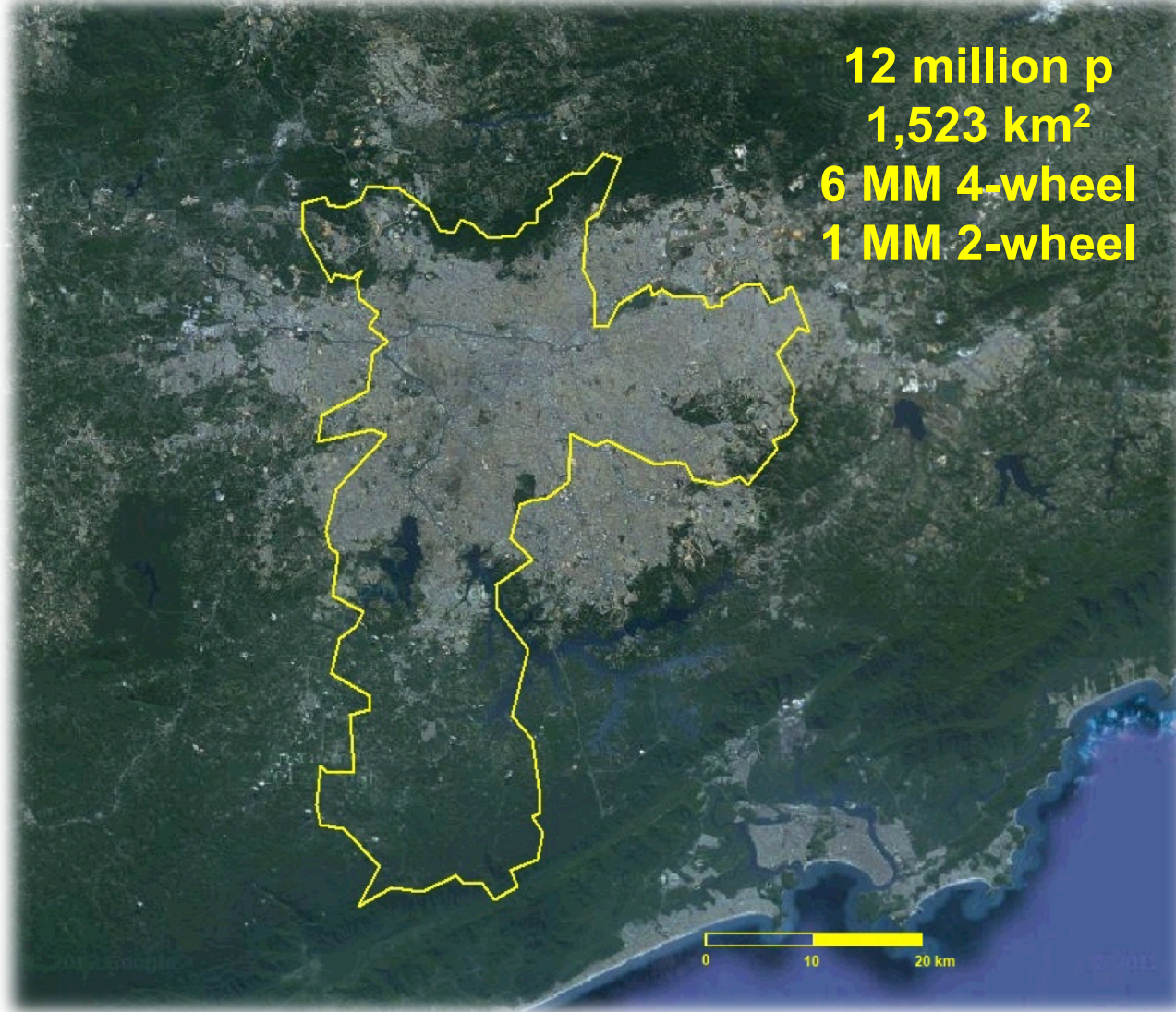
- OHD as an option to daytime deliveries
  - Positive impacts (Holguín-Veras et al. 2011, 2018)
  - Externalities:
    - Noise (Yannis et al. 2006)
    - Security (Noel et al. 1980)
    - Traffic accidents, congestion (Vasconcellos 2005)
- Delivery performance
  - Improvements: carriers and receivers
    - Quiroga 2000; Holguín-Veras et al. 2010, 2011, 2017; Stathopoulos 2011; Ljubicic Pavlovic 2015

# Objectives



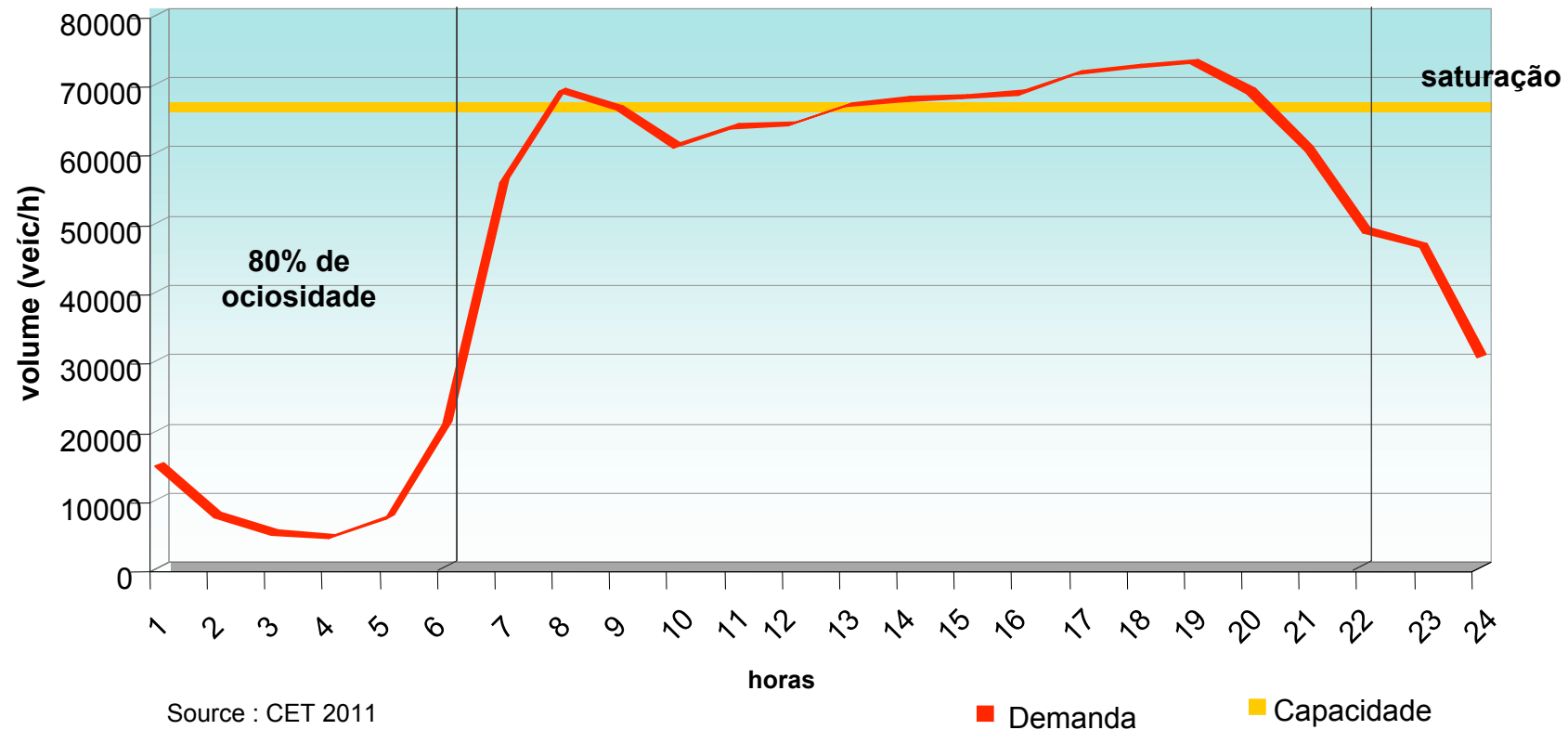
- Perception of OHD by logistics providers and receivers
  - Are OHD more efficient from an operational standpoint?
  - What are the main externalities associated to OHD?
- In the aftermath of São Paulo OHD pilot project of 2015.

# Background: São Paulo City OHD pilot project

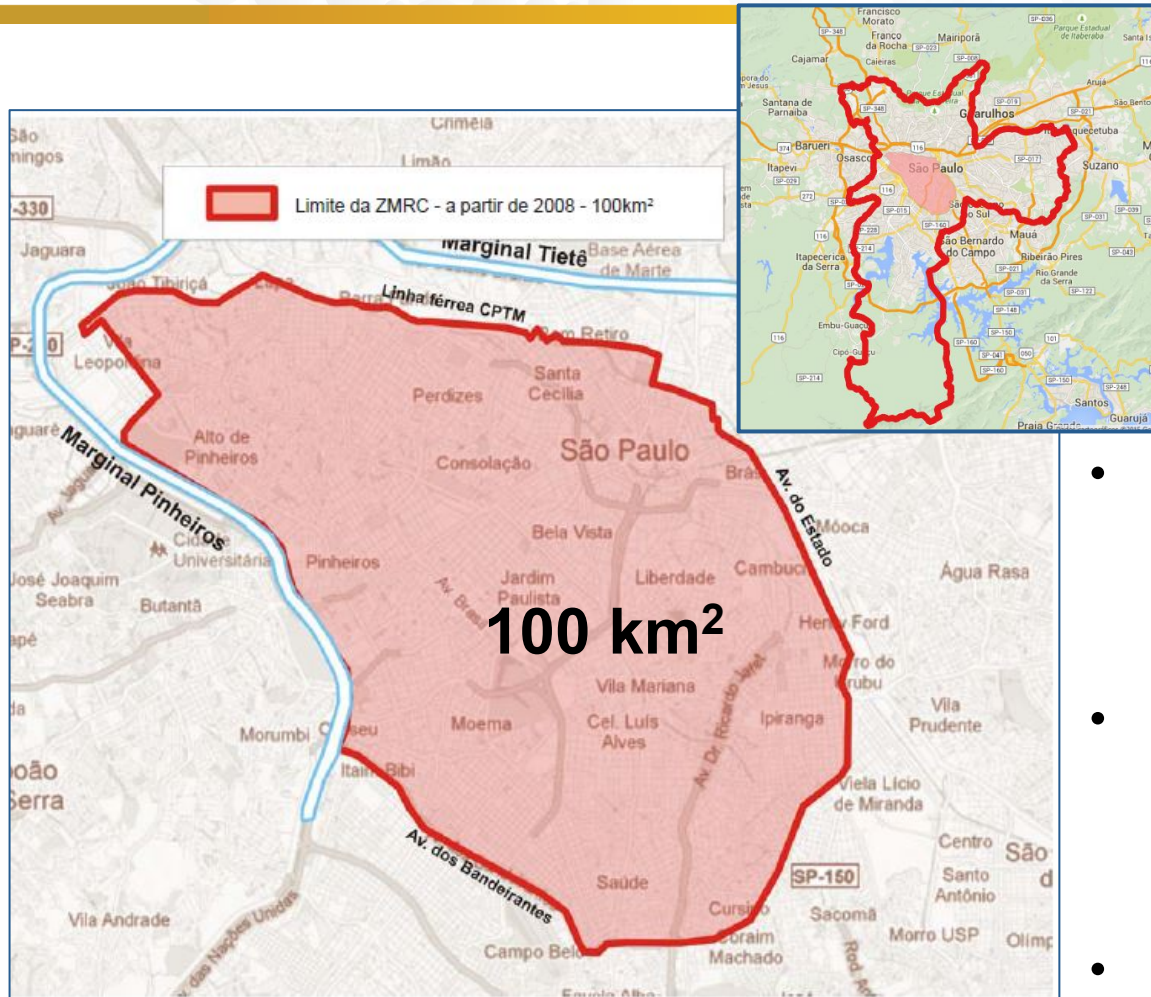


# Demand for infrastructure

## Traffic Volume – Inner Belt



# Background: ZMRC (truck ban zone)



Source: CET, 2011.

Created in 1986:

- 1986: small cordon downtown
- 2007: 100 km<sup>2</sup>



Source: locatruck.com.br

- Restrictions
  - Mon – Fri : 5am. to 09pm.
  - Sat: from 10am. to 02.pm
- Exception: VUCs can circulate anytime!
  - VUC: 4 ton (6,30 x 2,20 m)
- Authorities expected deliveries moving to the night

# The consequences

- Congestion still at high levels
- Small truck and fleet skyrocket
- Deliveries remain high during daytime hours



CISLOG 2012



# Pilot timeline



**TRANSPORTE URBANO DE CARGA:  
UMA PERSPECTIVA GLOBAL**

Palestrantes Internacionais

Dr. José Holguín-Veras  
Rensselaer Polytechnic Institute

Participantes

- S
- E
- F

**CISLOG**  
VREF'S CENTER OF EXCELLENCE FOR  
SUSTAINABLE URBAN  
FREIGHT SYSTEMS

**MLog**  
Mestrado em Engenharia de  
Sistemas Logísticos POLI/USP

**Rensselaer**

## 2013

- January: new Mayor
- Julv: Workshop CISLOG/USP VREF/SUFS

at SETCESP, 200 carriers.

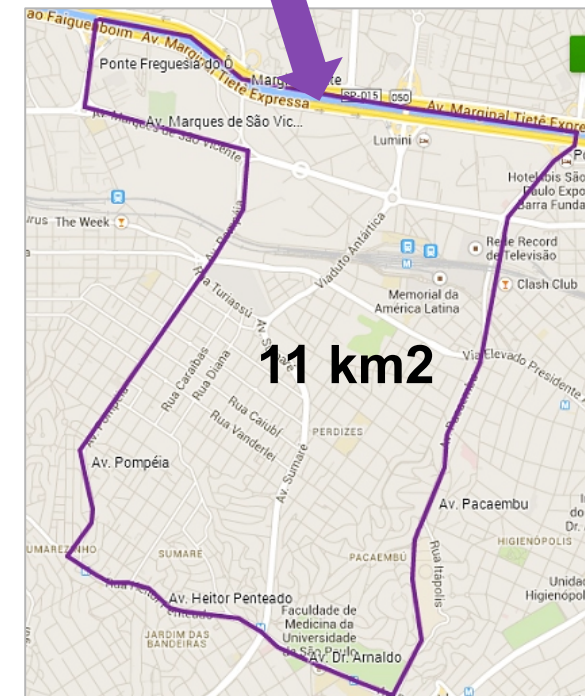
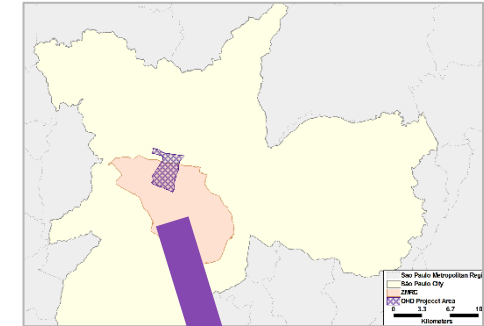
by group SMT, SETCESP, IDV, CISLOG/USP  
Division by the Secretary of Transport  
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wave (street stores)  
ond wave (shopping malls)  
ave (big street stores, etc)

- May: Results Seminar with Mayor
- August: Urban Freight Division created

# The pilot project in São Paulo City



- Evaluate **night deliveries** as a freight policy
- Mixed task force: SP traffic authority, carrier syndicate, retailer association, academia
- Main concerns
  - Safety (people, cargo, property)
  - Noise
  - Productivity and costs
- 11 volunteer companies (big retailers)
  - No cash incentives
  - 45 establishments (stores)
  - 3 waves, from Oct 2014 to Mar 2015
  - Extensive use of GPS data for evaluation



# Results and aftermath

- Pilot was a qualified success:
  - Safety and noise: no occurrences
  - Productivity: higher speeds and smaller delivery times at night
  - Cost trade offs: better for integrated supply chains
- Mayor:
  - “Freight should be treated as public transportation, both deal with the city economic lifeblood.”
  - Division of Freight Transportation created in August 2015
  - Official public policy
    - Larger, vertical companies (19)



# SAFETY

**Safety of people & operations were main concerns of all involved.**

- Fact: **no occurrences** during pilot periods (official SP police data)
- Safety conditions are very different between receivers
  - **Larger stores, shopping malls** x **Small street stores**
  - **High risk goods** x **Low risk goods**



Fonte: CISLOG 2015



Fonte: Google Maps 2015

# NOISE

Fact: no noise complaints (official SP Prefecture data)

- Every source has at least one countermeasure.
- Different supply chains, very different conditions.

QUIETER

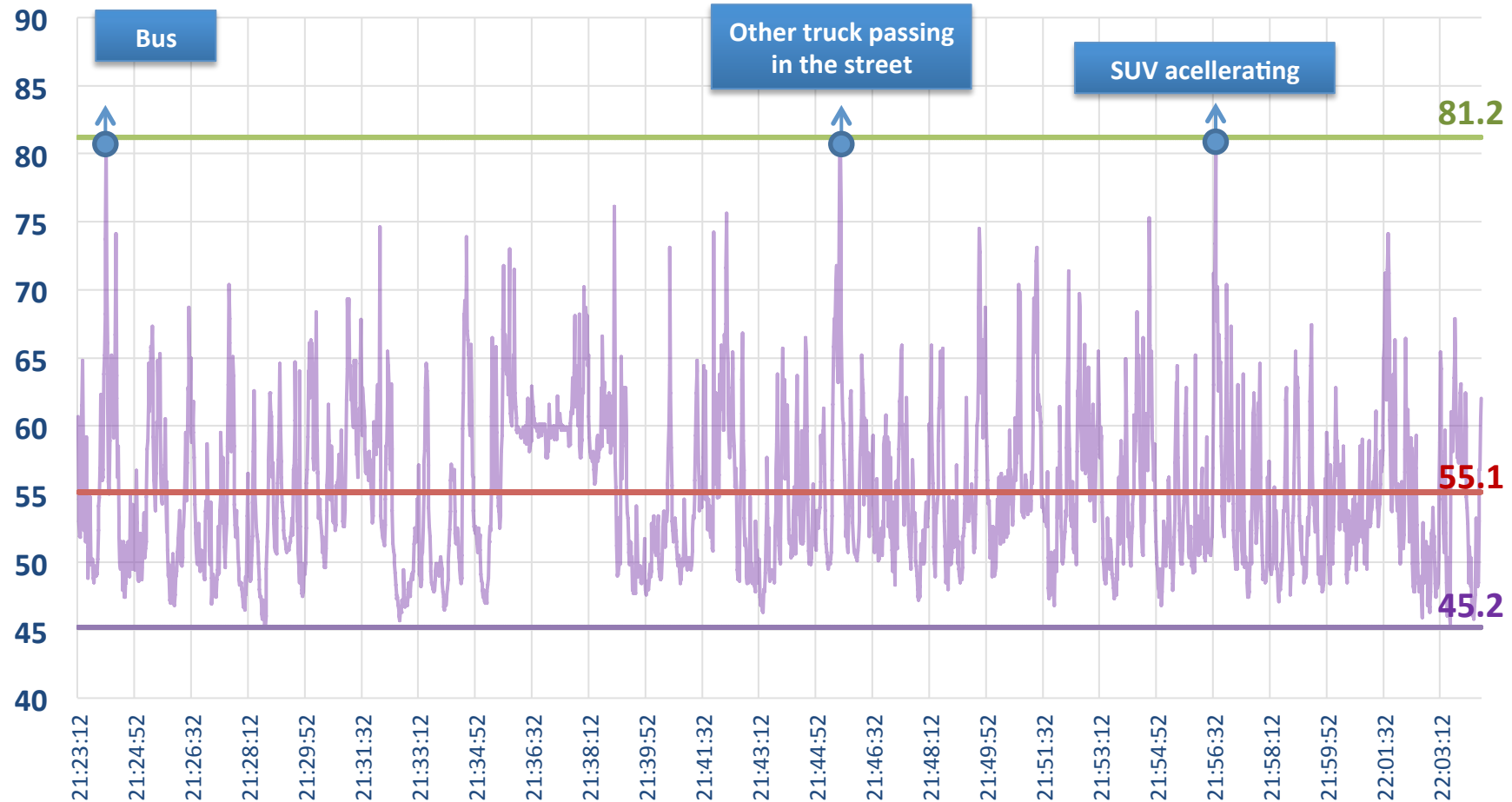


NOISIER

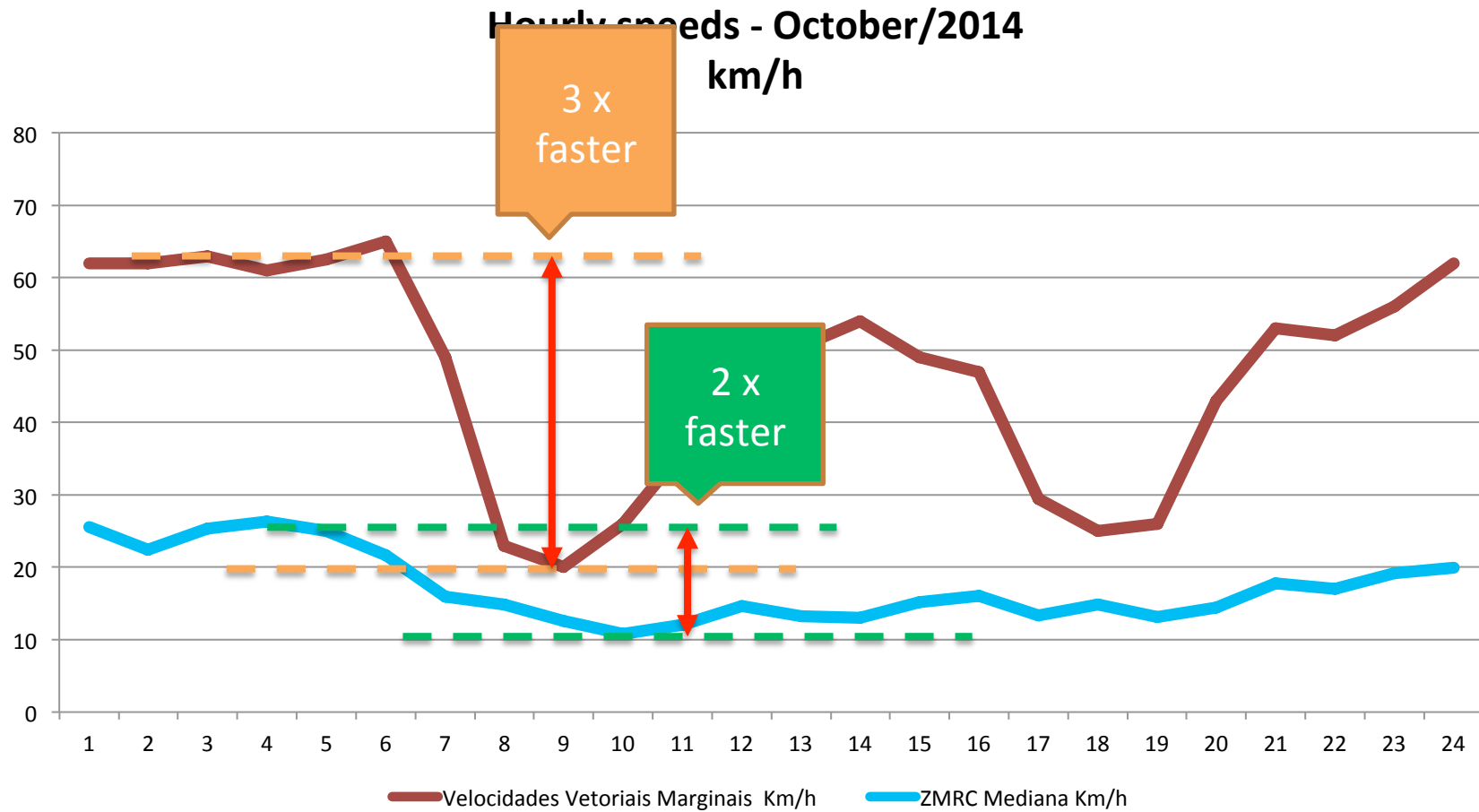


# Noise (dBA)

## Example of noise profile



# PRODUCTIVITY: Truck speeds



Source: CISLOG 2015

# METHODOLOGY



- Survey following the OHD pilot
  - Oct/2014 – Mar/2016
    - Questionnaire with face to face interviews
  - Operational level personnel
    - Actual experience with OHD
- Sample
  - 84 receivers, 17 different retailers (4 from OHD)
    - Grocers, pharmacies, house improvement, stationery
  - 100 drivers
- Multivariate statistics
  - Correspondence Analysis



# Operational statistics



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Measurements	Route time (Hours/Day)		Finding slots to parking (min)	
	Daytime	Overnight	Daytime	Overnight
Average	9.15	4.4	47.83	11.82
Median	9.5	4	40	15
Standard deviation	3.19	2.02	35.73	10.31

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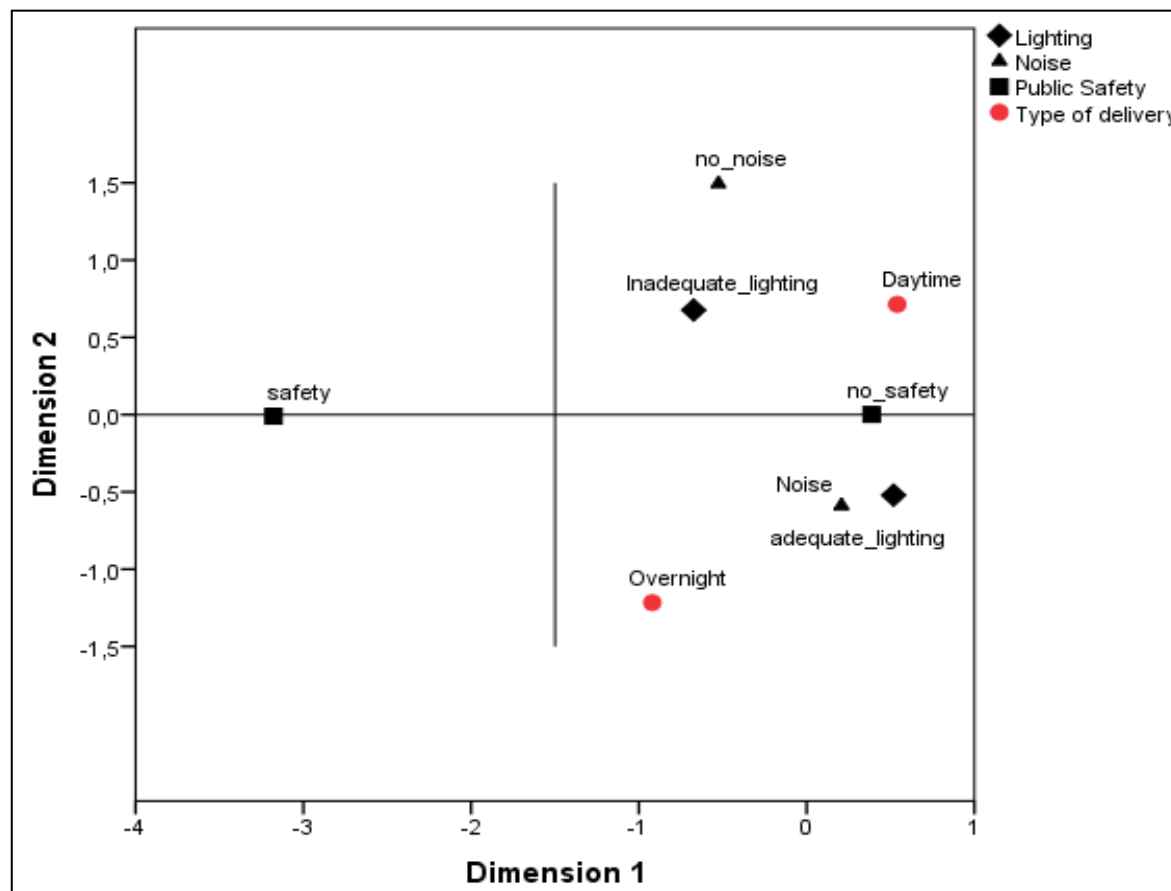
# Drivers

- 70% prefer driving at night
  - Security is an issue
- 71% more punctual at night
- 74% got fines
  - 60% parking tickets during the day (2/3 in ZMRC)
- 80% less stressed at night
  - Likert scale: **1,27** (night) vs **3,17** (day)

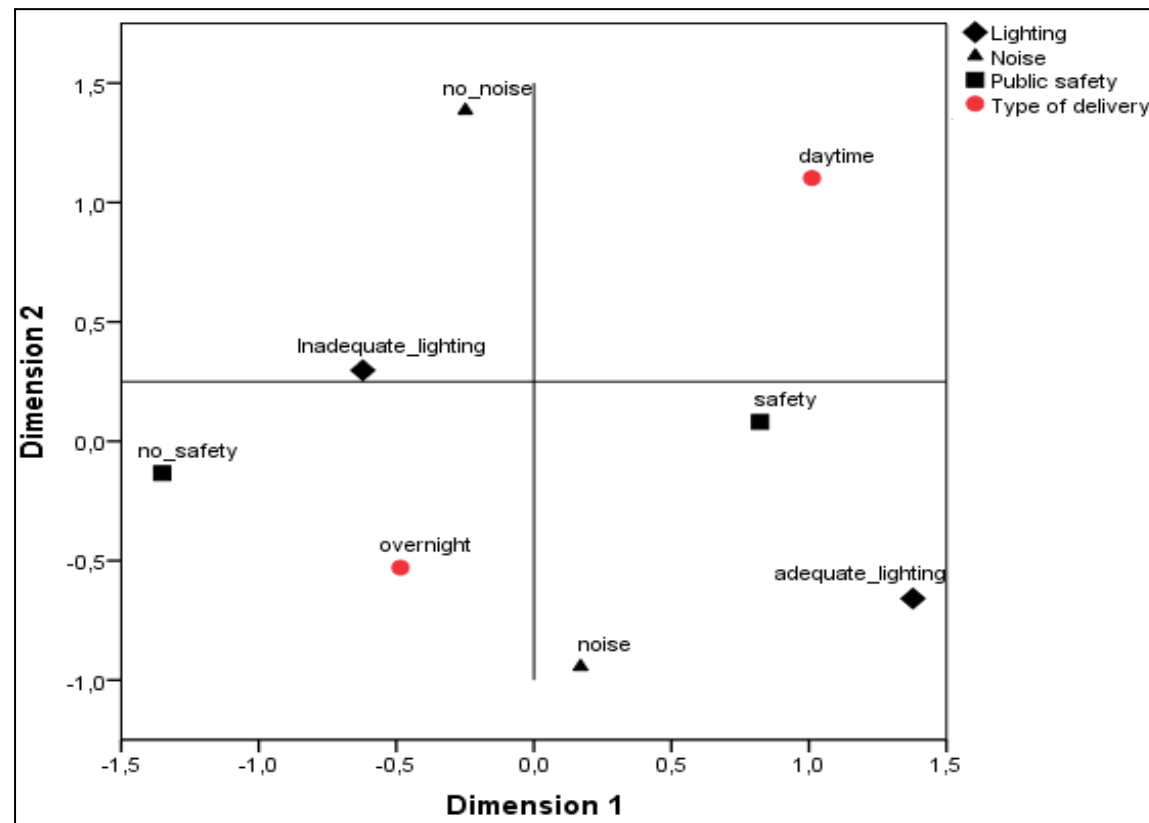
# Receivers

- 58% fell unsafe at night
- 39% complaints from OHD
- 63% stated that trucks are more punctual at night
- 73% stated that it is easier to confer and organize merchandise at night
- 65 % prefer to receive merchandise at night
  - Availability of public transportation at night

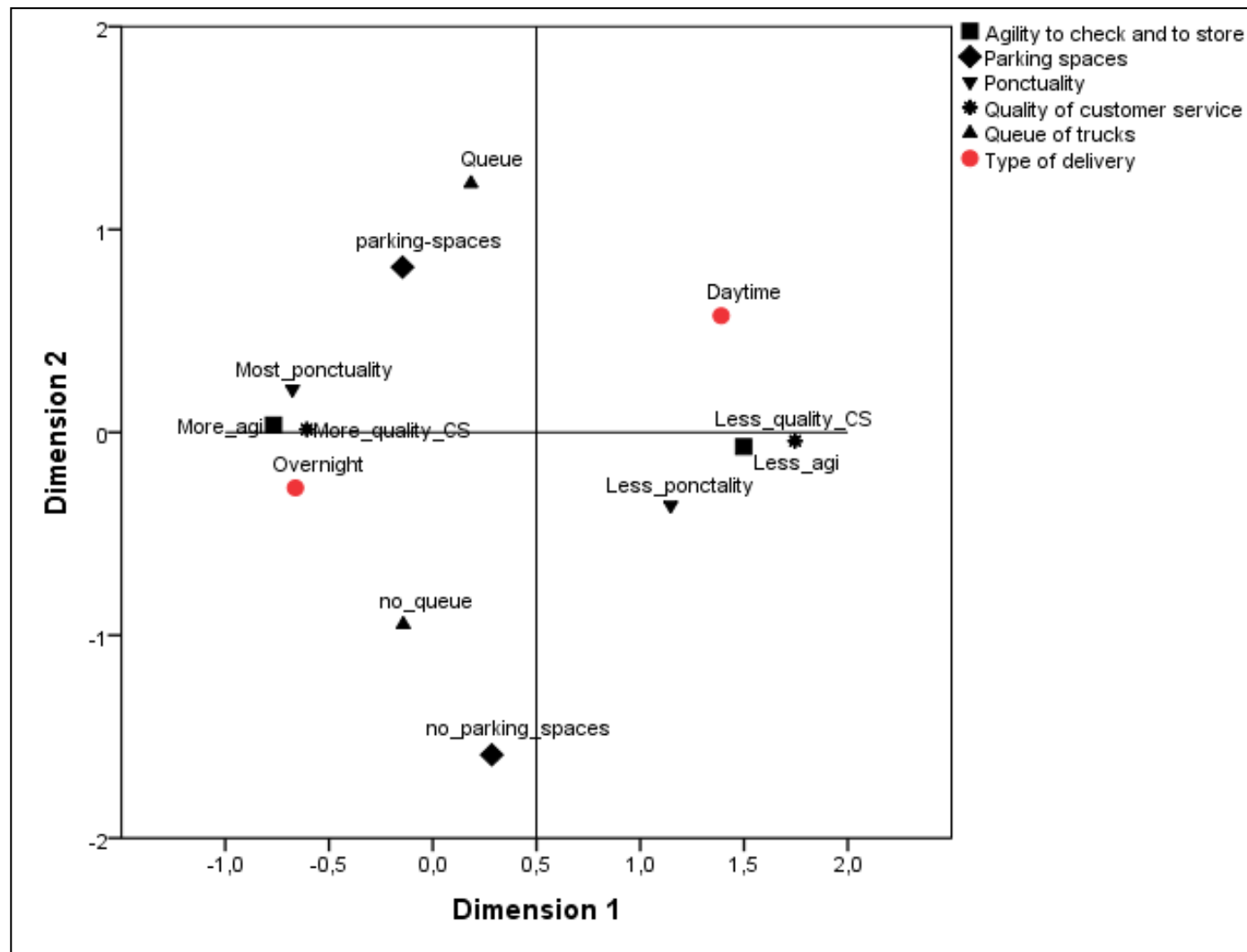
# Hour preference x Problems: Drivers



# Hour preference x Problems: Receivers



# Hour x Logistics efficiency: Receivers



# Conclusions



- Consistent with previous literature
- Security is big issue
  - Public infrastructure: lighting, parking space at night
  - Low risk merchandise at night
- Drivers
  - Looking for parking space in ZMRC during the day
- Receivers
  - Improvement of service quality

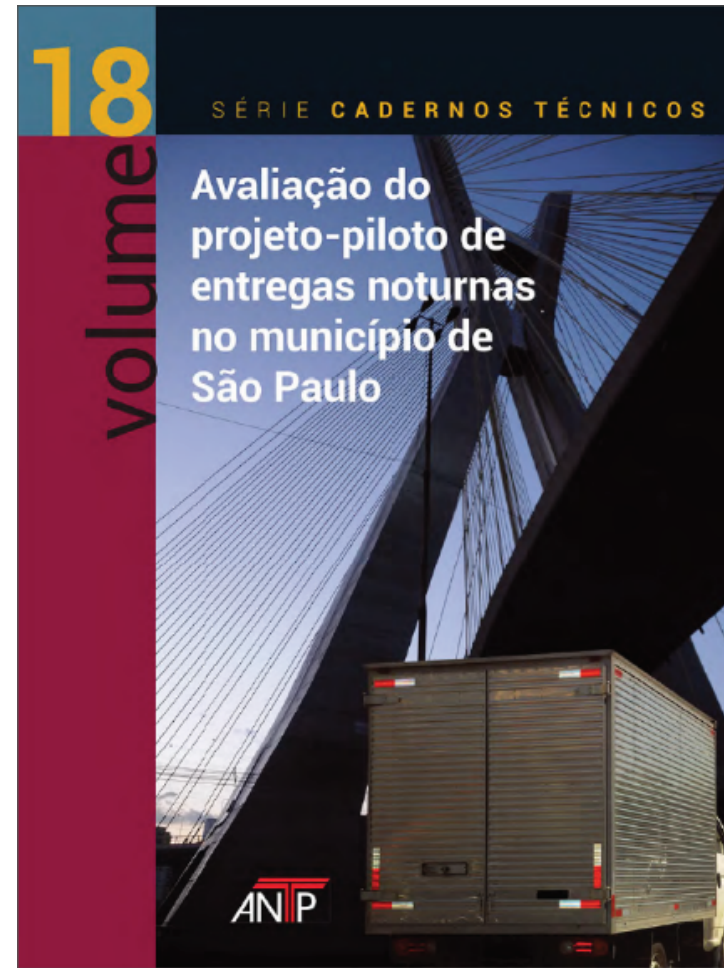
# São Paulo OHD Pilot Project (2014-2015)



- Yoshizaki et al (2018). The São Paulo Off-Hour Delivery Pilot: Impacts for City Logistics. In: Yoshizaki, Velazquéz-Martinez, Mejía-Argueta. *Supply chain management and logistics in Latin America*. Emerald.
- Also complete report at:

<http://www.antp.org.br/biblioteca-vitrine/cadernos-tecnicos.html>

- \* Webinar 13 at VREF SUFS website:  
[//coe-sufs.org/wordpress/peer-to-peer-exchange-program/](http://coe-sufs.org/wordpress/peer-to-peer-exchange-program/)





**THANK YOU!**

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