A Long History & Thriving Practice

This paper uses the definition of cycle logistics put forth by Schilwa et al. (2015): "the use of human powered or electrically-assisted standard bicycles, cargo bikes, and cargo tricycles for the transport of goods between A and B, primarily in urban areas" (p.52). Using bicycles and tricycles for delivering urban freight can help reduce the negative effects of motorized freight delivery and create more sustainable cities (7). Last-mile urban freight delivery is considered one of the most (or the most) expensive and polluting, and least efficient parts of the whole supply chain (15). Cycle logistics may have increased, at least in Copacabana, since the 1980s.

Inventory & Survey in 9 Commercial Centers

The data presented in this paper was gathered as part of a project carried out by the Brazilian NGO Transporte Ativo, in partnership with the Brazilian office of the international NGO the Institute for Transport and Development Policy (ITDP Brasil). The goal of this project was to discover key characteristics of cycle logistics in Rio de Janeiro. The tools applied were an inventory and survey of establishments that used cycle logistics. The inventory and survey were designed to determine the following information on human powered vehicles for urban freight delivery commercial centers of the city:

- Number of and types of establishments that used these vehicles
- Types of human powered vehicles they used
- Who owned these vehicles
- Number of the establishments employed to perform deliveries
- Number of daily workday deliveries
- Geographical reach of deliveries made

The researchers wished to survey a randomly diverse sample of the 120 commercial centers of commercial areas in the city’s seven sub-prefectures. As such, they contacted with a specialist at the municipal authority charged with implementing and maintaining programs in public spaces (RioUrbe) to select the densest square kilometer in terms of commercial activities, as evidenced by business establishments and shoppers. Considering budget and time constraints, the researchers identified nine commercial areas that contained a broad range of income and urban typologies, and were geographically evenly distributed across the city. After identifying nine commercial centers in the city’s seven sub-prefectures, the researchers identified the boundaries of the areas where the inventory and survey was to be placed. 

The goal was to identify a square kilometer in each of the nine areas. The mean area of the survey sites was 1.03 square kilometers (standard deviation 0.05).

Commercial centers

Although the areas surveyed were very similar in size (around 1 square kilometer), the number of businesses using cycle logistics varied greatly. The three centers with largest numbers of these businesses accounted for 89% of the total establishments using cycle logistics:

- Copacabana was home to 187 of these (58%), Tijuca, 68 (21%) and Centro, 32 (10%). In fact, these three areas accounted for 89% of all uses using cycle logistics encountered in this inventory.

While Iha do Governador, Bangu, Madureira, Taquara and Santa Cruz had relatively few businesses using cycle logistics, Campo Grande stood out because researchers did not register any such businesses.

Discussion & Conclusion

The domination of three commercial centers (Copacabana, Tijuca, and Centro) in the total businesses that employ cycle logistics in the nine areas of the inventory raise the question of what circumstances allow these businesses to thrive in these areas. Copacabana and Tijuca are relatively dense, high-income areas with a more “traditional” urban typology – relatively narrow streets, and apartment buildings with street-level businesses. Centro is the business center of the city, and also a relatively dense, active place, with a “traditional” urban typology, though with fewer residential buildings than in Copacabana and Tijuca. The other areas are lower income and have relatively less dense and urban typologies typical of peripheral neighborhoods in Latin America, fewer apartment buildings.

These variables (income, density and urban typology) should be investigated as possible explanations for the prevalence of cycle logistics in these neighborhoods.

Cycle logistics in Rio may also present non-trivial economies in terms of emissions of greenhouse gases and urban space. In order to determine these, a survey must be structured in a way that means for length of trip, the weight and volume of freight delivered, and deliveries per trip can be determined (this is not possible with the data from the current survey). This information would also allow for a calculation to derive the urban space that these vehicles save, both in terms of parking and road space used had the trips been made by equivalent non-electric vehicles (e.g., motorcycles, bicycles and cargo bicycles and vans for trucks). Given that cycle logistics are a clear, silent, and space-efficient way to complete last mile deliveries, municipal authorities may have an interest in stimulating such deliveries.

The road transportation sector is the largest source of greenhouse gas emissions (39%) originated in the city of Rio de Janeiro and cycle logistics could help reduce these emissions. According to the Municipal Climate Change Law No. 5248/2011 (39), the goal of the City is to reduce carbon emissions by 30% by 2020, an increase in the use of zero-emissions vehicles (bicycles and tricycles) could help meet this goal.

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