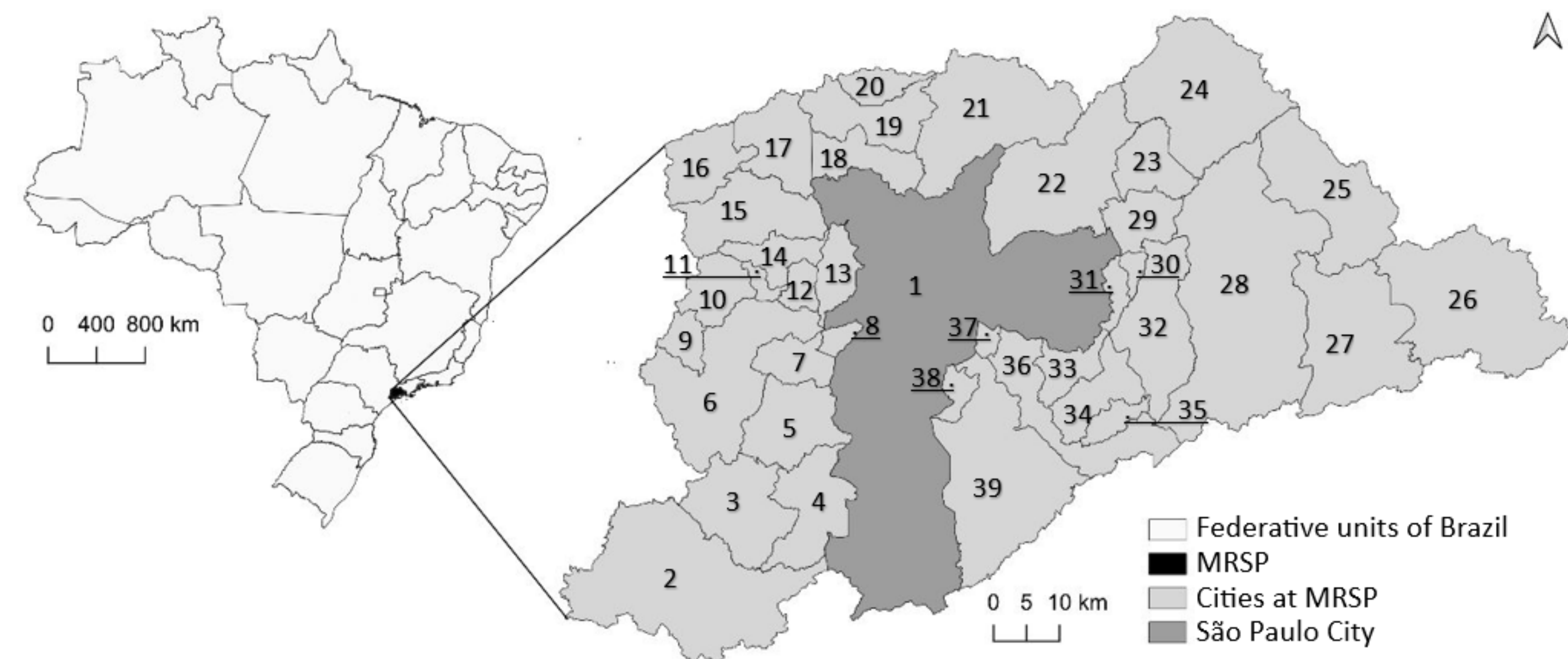
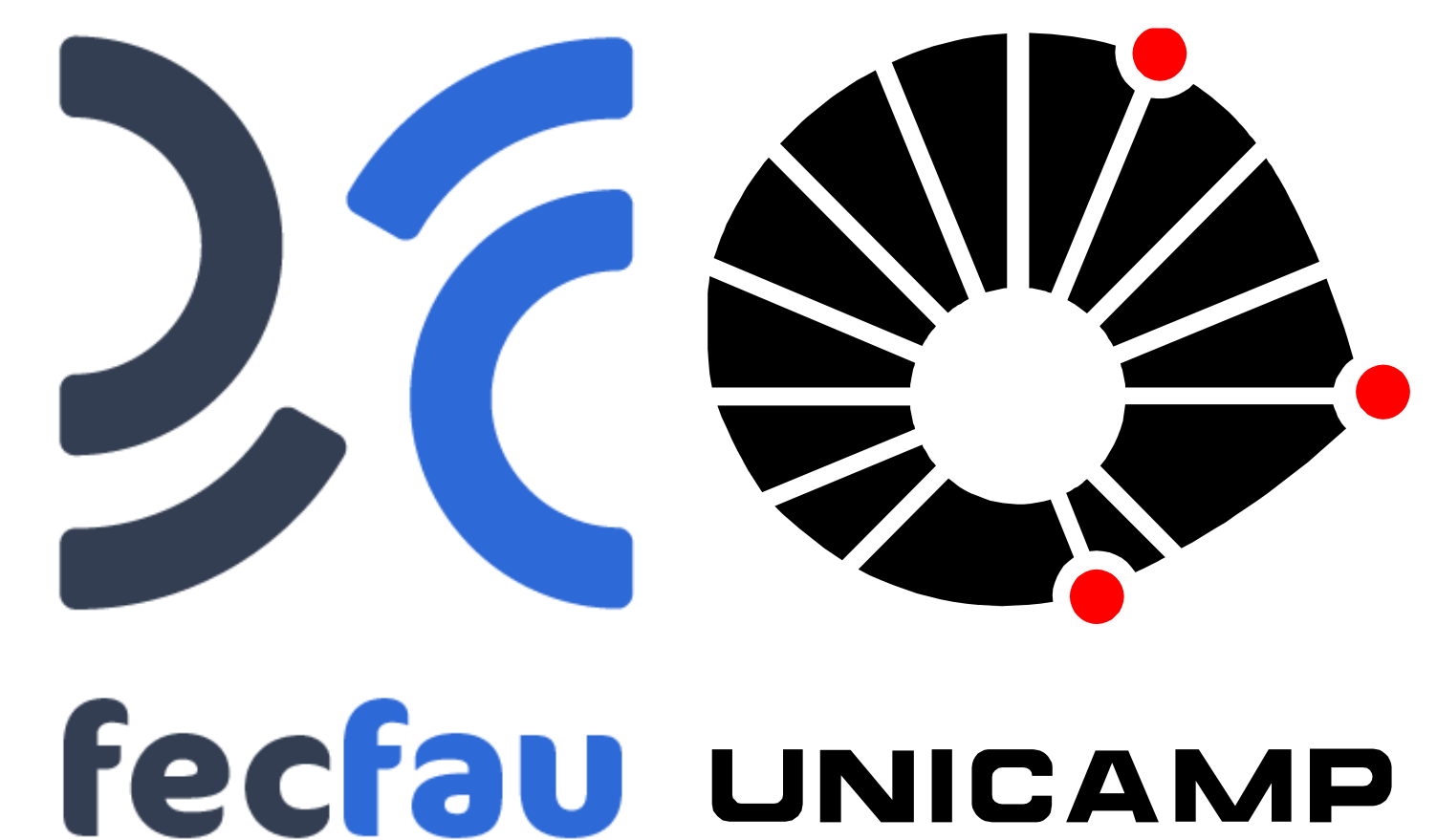


## 2nd International Conference on Future Challenges in Sustainable Urban Planning & Territorial Management

Title: CHANGING URBAN MOBILITY HABITS IN SÃO PAULO: AN ANALYSIS FROM 2017 TO 2022

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São Paulo (1); Juquitiba (2); São Lourenço da Serra (3); Embu-Guaçu (4); Itapeverica da Serra (5); Cotia (6); Embu das Artes (7); Taboão da Serra (8); Vargem Grande Paulista (9); Itapevi (10); Jandira (11); Carapicuíba (12); Osasco (13); Barueri (14); Santana de Parnaíba (15); Pirapora do Bom Jesus (16); Cajamar (17); Caieiras (18); Franco da Rocha (19); Francisco Morato (20); Mairiporã (21); Guarulhos (22); Arujá (23); Santa Isabel (24); Guararema (25); Salesópolis (26); Biritiba Mirim (27); Mogi das Cruzes (28); Santo André (29); Poá (30); Ferraz de Vasconcelos (31); Suzano (32); Mauá (33); Ribeirão Pires (34); Rio Grande da Serra (35); Santo André (36); São Caetano do Sul (37); Diadema (38); and, São Bernardo do Campo (39).

Figure 1. Location and constituent municipalities of the MRSP

### Metropolitan Region of São Paulo (MRSP)

Fourth largest urban agglomeration in the world

Population of approximately 21 million people

Area of 7.9 thousand Sq.km

Per capita GDP of R\$ 47 thousand

Urban Public Transportation:

1. Subway system → 104.2 km and 91 stations
2. Railway system → 273.0 km and 96 stations
3. São Paulo Bus system → 1,347 lines and 11,925 buses
4. Metropolitan Bus system → 479 lines and 260 buses

### UPT mobility data in the MRSP

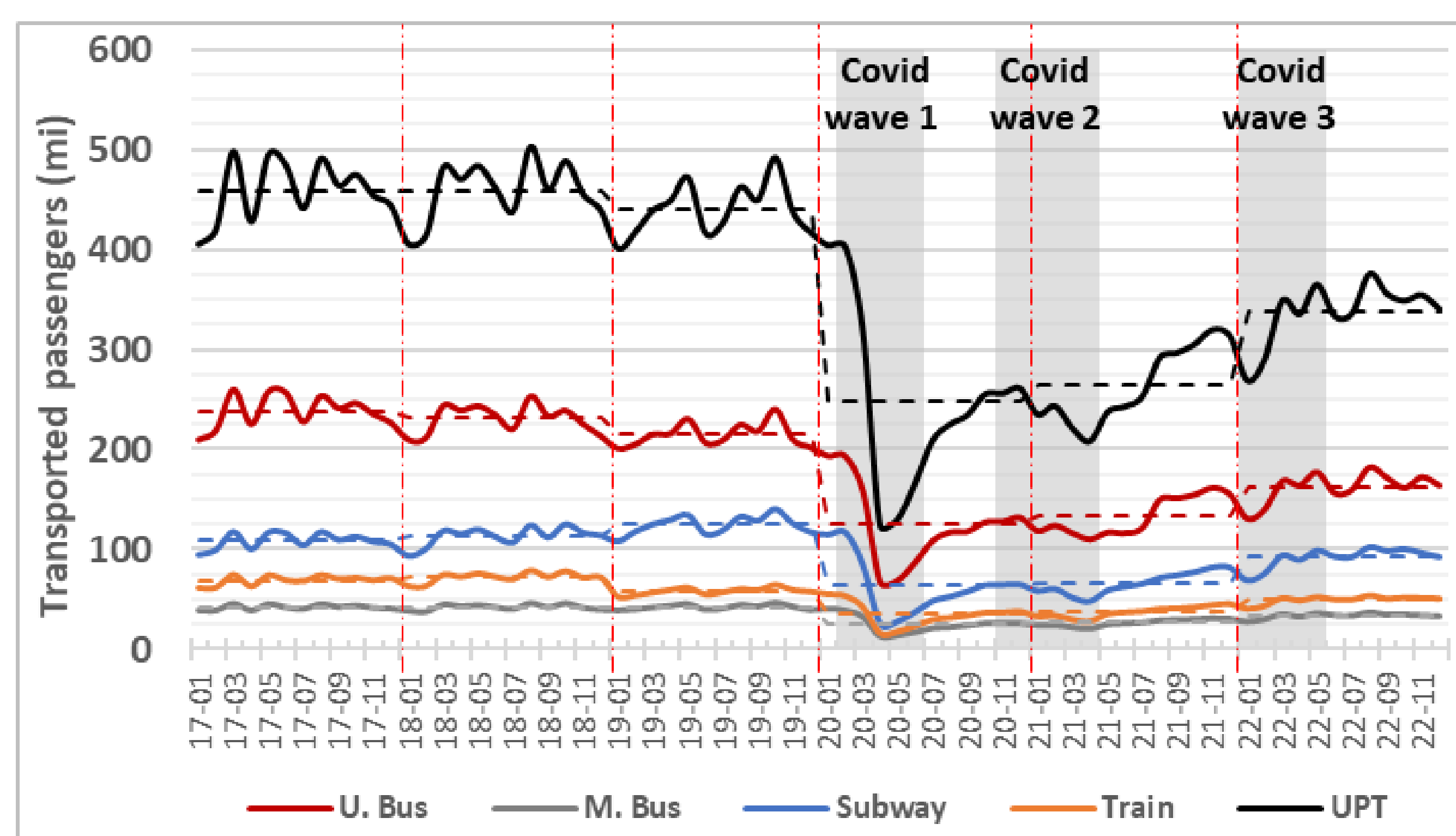


Figure 2. Passengers transported per month and annual average of passengers transported in each of the transport systems of the MRSP. The vertical dashed red lines inform the division of the years, and the gray columns show the three waves of covid in Brazil.

Year	Urban Bus	Var. (2017)	Metrop. Bus	Var. (2017)	Subway	Var. (2017)	Train	Var. (2017)	UPT	Var. (2017)
2017	2,863	-	504	-	1,303	-	828	-	5,497	-
2018	2,769	-3.3%	506	0.4%	1,359	4.4%	863	4.3%	5,498	~0.0%
2019	2,581	-9.8%	506	0.4%	1,495	14.7%	697	-15.8%	5,279	-4.0%
2020	1,500	-47.6%	303	-39.9%	764	-41.3%	415	-49.9%	2,981	-45.8%
2021	1,596	-44.2%	321	-36.3%	797	-38.8%	448	-45.9%	3,162	-42.5%
2022	1,949	-31.9%	403	-20.0%	1,104	-15.2%	593	-28.3%	4,049	-26.3%

Table 1. Passengers' volume (millions) and change based on 2017 (each transport system and UPT)

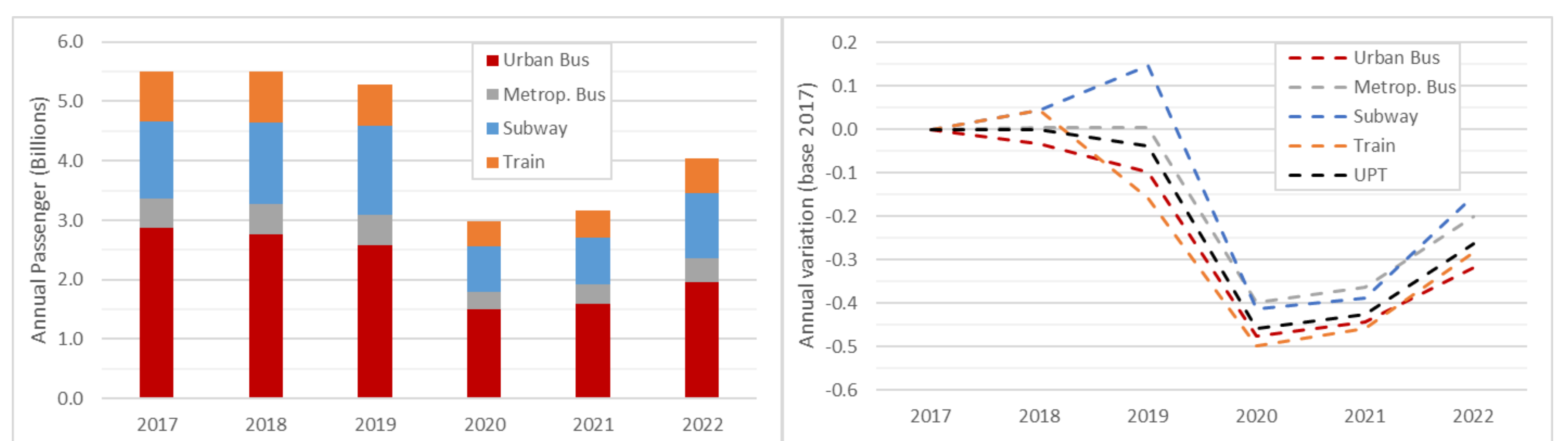


Figure 3. Passengers transported in the UPT of the MRSP: (a) Absolute composition of each mode of transport; (b) Annual change based on 2017 data.

### Conclusion

The pandemic triggered by Covid-19 had a drastic impact on urban mobility, reflected in the abrupt drop in passenger numbers in March 2020. However, there is evidence of a remarkable recovery from August 2020 onwards, indicating a resilience of the public transport system. Despite the subsequent waves of the pandemic, the data reveal monthly oscillations and an annual average that denote a gradual and continuous adaptation to the new conditions imposed.

The comparative analysis between the various modes of transport reveals that the subway system stood out, showing the best recovery in 2022, while the bus and rail systems showed considerable variations over the period studied. The annual variation based on 2017 highlights a downward trend since 2018, except for the subway system, corroborating the complexity of the interactions between the pandemic, changes in consumption patterns, and the specific resilience of each mode of transport.

In addition to the direct influence of the pandemic, the study points to structural changes in urban consumption habits, with the increase in online services and a resumption of commerce in neighborhoods. These factors, coupled with the drop in passenger volume, raise concerns about sustainability and investments in urban public transport systems.

Given this scenario, it is crucial that public transport authorities and managers consider innovative strategies to face the challenges posed by the current situation. The search for solutions that promote efficiency, sustainability and adaptation to the new mobility paradigms is essential to ensure not only the recovery, but also the strengthening and continuous evolution of urban public transport in the MRSP.

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