

The impact of COVID-19 on urban logistics

Dr. Laetitia Dabanc

- Research oriented Chair
- Warehouses, innovations, new trends in consumption and impacts on city logistics

Results available online:

- Observatory of ecommerce mobilities (<https://www.ecommercemobilities.com/>)
- Survey reports on gig workers for instant delivery platforms in Paris 2016, 2018, 2020, 2021
- Barometer of urban logistics under covid lockdown
- Logistics real estate and relationships with urban form in 74 large cities around the world



<https://www.lvmt.fr/en/chaire/logistics-city/>

How to research on COVID impacts?

- Differences in time and space: the global COVID-19 pandemic has translated in different countries into a variable mix of lockdowns, curfews and diverse sanitary measures since the end of 2019
- Many trends already on, were accelerated (or not) by COVID
- Use of routine surveys and data collections + specific *ad hoc* surveys
- Implementing surveys and interviews during a pandemic: many respondents happy to testify on their activity during these very unusual times
- An abundance of webinars further increased access to information on stakeholders' perceptions and data

How COVID-19 is changing the world: a statistical perspective



“More than 90% of covid-19 cases are happening in urban areas”

(UNSTATS, CCSA, May 2020)

World Conference on Transport Research Society's book project

Transportation Amid COVID-19 and Pandemics: Practices and Policies

Editors: Yoshitsugu Hayashi & Junyi Zhang



"This handbook is a systematic collection about COVID-19 and other pandemics in association with transport, logistics, and supply chains, in various modes in both developed and developing countries, covering different geographical territories and cultures, from both academic and practical perspectives.

Impacts of COVID-19 and other pandemics on transport, logistics and supply chains and their consequent influences on citizens' life and industries will be investigated. **How to prepare** for pandemics in practice will be reviewed"

PART I: IMPACTS OF COVID-19 ON TRANSPORT, LOGISTICS AND SUPPLY CHAINS

PART II: EFFECTS OF POLICY MEASURES AT DIFFERENT PHASES OF COVID-19 PANDEMIC

PART III: COUNTRIES (Chapter *Impact of COVID-19 on Public Transportation in Urban India*)

PART IV: LESSONS LEARNED FROM HISTORY AND PREPAREDNESS

PART V: CHANGES TOWARD THE FUTURE

Chapter: Dablanc, L. *Impacts of COVID pandemic on urban logistics and policy lessons*

Methodology for urban logistics chapter

- Literature review
- Economic press
- Institutional reports
- Business and practitioners' webinars
- **Four original surveys** for the French case (Dablanc et al., 2021)



Literature review

- By April 2021, about 20 publications on COVID and urban freight in scientific journals
- On India: Gosh, S., Seth, T., Tiwary, H. (2021) How does Covid-19 aggravate the multidimensional vulnerability of slums in India? A Commentary. *Social Sciences & Humanities Open*
- In addition: two sessions on COVID and urban freight at the VREF international conference on urban freight, March 2021 (online)
- Ogochukwu and Ugboma (2021): interesting research showing how new last mile logistics services compensated for open markets in Lagos, Nigeria, during the lockdown
- Mogaji (2021): the pandemic in Lagos has increased the cost of freight transportation, making deliveries more complicated, especially for the informal economy, with direct impacts on food prices

Alaimo, L., Fiore, M., Galati, A. (2021) Measuring consumers' level of satisfaction for online food shopping during COVID-19 in Italy using POSETs. *Socio-Economic Planning Sciences*, <https://doi.org/10.1016/j.seps.2021.101064>

Altuntas, C., Sanchez-Diaz, I., Halldorsson, A., Triin Ait, L. (2021) Stay home but how will the goods come to you? Providing access to goods during a pandemic. Presented at VREF Conference on Urban Freight 2021 (online), 23-25 March.

Barman, A., Das, R., De, P.K. (2021) Impact of COVID-19 in Food Supply Chain: Disruptions and Recovery Strategy. *Current Research in Behavioral Sciences*, <https://doi.org/10.1016/j.crbeha.2021.100017>.

Beckers, J., Weekx, S., Beutels, P., Verhetsel, A. (2021) COVID-19 and retail: the catalyst for e-commerce in Belgium? *Journal of Retailing and Consumer Services*, Vol 62, 102645.

Dablan, L., Heitz, A., Diziain, D., Buldeo-Rai, H. (2021a) Urban logistics in times of lockdown: an analysis of three surveys in France. Presented at VREF Conference on Urban Freight 2021 (online), 23-25 March.

Fan, S., Teng, P., Chew, P., Smith, G., Copeland, L. (2021) Food system resilience and COVID-19, lessons from the Asian experience. *Global Food Security*, Vol 28, 100501.

Figliozi, M., Unnikrishnan, A. (2021) Home-deliveries before-during COVID-19 lockdown: Accessibility, environmental justice, equity, and policy implications. *Transportation Research Part D*, Vol 93, 102760.

Gevaers, R., Cardenas, I., Dewulf, W., Beckers, J. (2021) Why COVID-19 will change B2C parcel last mile network structures. Presented at VREF Conference on Urban Freight 2021 (online), 23-25 March.

Holguín-Veras and Wang (2020) *Surveys Reveal Significant Shifts in Consumer Behavior During Pandemic*. Series of three webinars, Rensselaer Polytechnic Institute, New York, USA. Information available from: <https://eng.rpi.edu/news/07012020-0000/surveys-reveal-significant-shifts-consumer-behavior-during-pandemic> (last accessed on August 4, 2021).

Ivanov, D., Dolgui, A., Sokolov, B., Ivanova, M. (2017) Literature review on disruption recovery in the supply chain. *International Journal of Production Research*, 55(20), 6158-6174.

Kim R.Y. (2020) The Impact of COVID-19 on Consumers: Preparing for Digital Sales. *IEEE Eng. Manag. Rev.* Vol 48, 212–218.

Loske, D. (2020) The impact of COVID-19 on transport volume and freight capacity dynamics: An empirical analysis in German food retail logistics. *Transportation Research Interdisciplinary Perspectives*, Vol 6, 100165.

Lozzi, G., Marcucci, E., Gatta, V., Pacelli, V., Rodrigues, M., Teoh, T., 2020. Research for TRAN Committee – COVID-19 and urban mobility: impacts and perspectives. Brussels.

Mogaji, E. (2021) Impact of COVID-19 on transportation in Lagos, Nigeria. *Transportation Research Interdisciplinary Perspectives*, Vol 6, 100154.

Mousavi, K., Khan, S., Saiyed, S., Roorda, M. (2021) Toronto Area Off-peak delivery program: Before, during and after COVID-19. Presented at VREF Conference on Urban Freight 2021 (online), 23-25 March.

Ogochukwu, Ugboma (2021) An examination of last-mile logistics of food value chain during COVID-19 pandemic lockdown in metropolitan Lagos. Presented at VREF Conference on Urban Freight 2021 (online), 23-25 March.

Pani, A., Mishra, S., Golias, M., Figliozi, M. (2020). Evaluating public acceptance of autonomous delivery robots during COVID-19 pandemic. *Transportation Research Part D*, Vol 89, 102600.

Pirie, S., Trepanier, M., Gendron, B. (2021) *Characterization of a COVID-fired urban bike delivery system*. CIRRELT Report 2021-02. Available from: (last accessed on August 4, 2021).

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Villa, R., Monzon, A. (2021) Mobility Restrictions and E-Commerce: Holistic Balance in Madrid Centre during COVID-19 Lockdown. *Economies*, Vol 9 (57).

Yang, F., Li, X., Meng-ChangLau, V., Zhu, V. (2021) To survive or to thrive? China's luxury hotel restaurants entering O2O food delivery platforms amid the COVID-19 crisis. *International Journal of Hospitality Management*. Vol 94, 102855.

Scientific journal
publications on COVID
and urban freight by
April 2021 + selected
VREF urban freight
conference presentations

European Parliament brief, August 2020

- COVID 19-related urban mobility challenges with one Section dedicated to freight and logistics (Lozzi et al., 2020)
- Fragmentation in loads and trips is one of the key delivery challenges, driving an increase in the number of deliveries and the related environmental impacts
- New types of soft modes (such as cargo-bikes) for freight movements have emerged
- The sector suffers from shortages in terms of workforce, assets and resources and needs to make urban logistics more efficient

2020-2021: the demand for goods has changed

- Goods managed to maintain a high level of mobility, thus guaranteeing the supply of cities (supermarkets, markets, warehouses...) and limiting the possible effects of shortages
- E-commerce has increased everywhere
- New York City added nearly 500,000 parcel deliveries a day in 2020, for a daily total of about 2.4 million
- In Europe, more than one in three consumers who made online food purchases during the first wave of lockdowns were new on-line consumers, with 70% being baby-boomers
- First semester 2021: COVID consumption 'habits' remain
- New trend in Europe: q-commerce (quick commerce)



Beijing, April 2020

Q-commerce: very fast deliveries of grocery

- Cajoo promises to deliver in 15 minutes
- Gorillas promises to deliver in 10 minutes
- Alibaba promises to deliver in 5 minutes



Fierce competition and many new startups in Europe

Table 1: Online retail sales, selected economies, 2018-2020

Economy	Online retail sales (\$ billions)			Retail sales (\$ billions)			Online share (% of retail sales)		
	2018	2019	2020	2018	2019	2020	2018	2019	2020
Australia	13.5	14.4	22.9	239	229	242	5.6	6.3	9.4
Canada	13.9	16.5	28.1	467	462	452	3.0	3.6	6.2
China	1,060.4	1,233.6	1,414.3	5,755	5,957	5,681	18.4	20.7	24.9
Korea (Rep.)	76.8	84.3	104.4	423	406	403	18.2	20.8	25.9
Singapore	1.6	1.9	3.2	34	32	27	4.7	5.9	11.7
United Kingdom	84.0	89.0	130.6	565	564	560	14.9	15.8	23.3
United States	519.6	598.0	791.7	5,269	5,452	5,638	9.9	11.0	14.0
Economies above	1,770	2,038	2,495	12,752	13,102	13,003	14	16	19

Source: UNCTAD, based on national statistics offices.

UNCTAD May 2021

Table 2: Top B2C e-commerce companies by GMV, 2020

Rank by GMV		Company	HQ	Industry	GMV (\$ billions)			GMV change (%)	
2020	2019				2018	2019	2020	2018-19	2019-20
1	1	Alibaba	China	E-commerce	\$866	\$954	<i>1,145</i>	10.2	20.1
2	2	Amazon	USA	E-commerce	\$344	\$417	<i>\$575</i>	21.0	38.0
3	3	JD.com	China	E-commerce	\$253	\$302	<i>\$379</i>	19.1	25.4
4	4	Pinduoduo	China	E-commerce	\$71	\$146	<i>\$242</i>	104.4	65.9
5	9	Shopify	Canada	Internet Media & Services	\$41	\$61	<i>\$120</i>	48.7	95.6
6	7	eBay	USA	E-commerce	\$90	\$86	<i>\$100</i>	-4.8	17.0
7	10	Meituan	China	E-commerce	\$43	\$57	<i>\$71</i>	33.0	24.6
8	12	Walmart	USA	Consumer goods retail	\$25	\$37	<i>\$64</i>	47.0	72.4
9	8	Uber	USA	Internet Media & Services	\$50	\$65	<i>\$58</i>	30.5	-10.9
10	13	Rakuten	Japan	E-commerce	\$30	\$34	<i>\$42</i>	13.6	24.2
11	5	Expedia	USA	Internet Media & Services	\$100	\$108	<i>\$37</i>	8.2	-65.9
12	6	Booking Holdings	USA	Internet Media & Services	\$93	\$96	<i>\$35</i>	4.0	-63.3
13	11	Airbnb	USA	Internet Media & Services	\$29	\$38	<i>\$24</i>	29.3	-37.1
		Companies above			\$2,035	\$2,399	\$2,890	17.9	20.5

Note: Alibaba year beginning 1 April, Walmart year beginning 1 February. Figures in italics are estimates. GMV = Gross Merchandize Value (as well as Booking Value).

Source: UNCTAD based on company reports.

UNCTAD May 2021

Table 4: B2C e-commerce sales: Top 20 economies, 2019

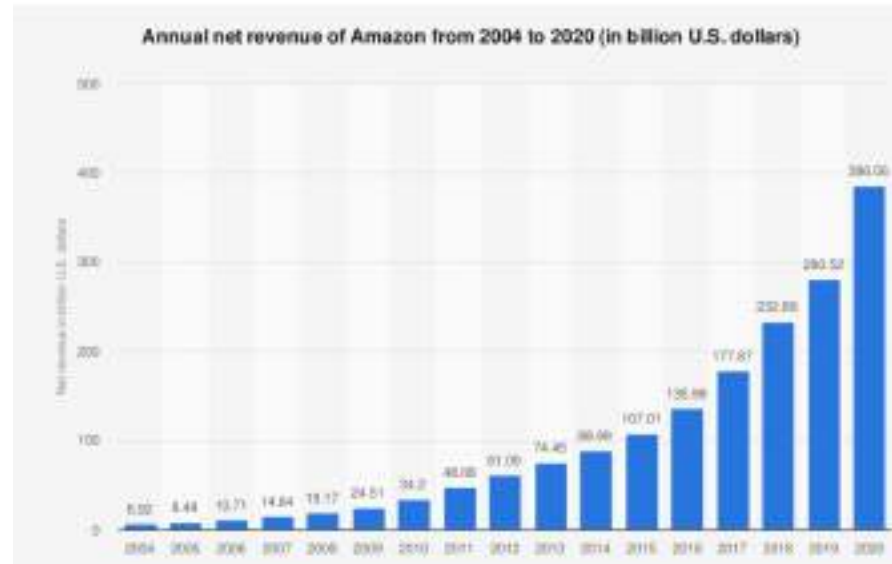
Rank	Economy	B2C e-commerce sales (\$ billion)	Share of B2C e-commerce sales in GDP (%)	Online shoppers (million)	Online shoppers (% of internet users)
1	China	1,539	10.7	639	75
2	United States	1,261	5.9	189	80
3	United Kingdom	251	8.9	42	88
4	Japan	178	3.5	55	54
5	France	116	4.3	38	77
6	Korea (Rep.)	115	7.0	27	66
7	Germany	111	2.9	56	84
8	Spain	64	4.6	23	64
9	India	61	2.1	70	20
10	Canada	53	3.0	24	84
11	Hong Kong (China)	38	10.4	2	38
12	Italy	35	1.8	19	49
13	Russian Federation	31	1.9	34	35
14	Mexico	31	2.5	26	32
15	Netherlands	29	3.2	12	84
16	Thailand	27	5.3	5	14
17	Ireland	25	6.4	2	73
18	Australia	21	1.5	12	73
19	Malaysia	19	6.0	15	35
20	Brazil	16	0.9	48	39
	20 above	4,021	5.9	1,339	59

Source: UNCTAD, based on sources mentioned in section 3 on methodology and data sources.

UNCTAD May 2021

Amazon

- Revenue \$386 Mds (2020), 15 times higher than McDonald's
- Amazon added 9 warehouses in New York City in 2020



Source: Amazon, Statista
2021

E-commerce growth: example of France

- +32% B2C products sold in 2020 (growth rate **twice as high** as usual)
- Traditional retail has accelerated **omni-channel** services
- Huge increase in grocery and DIY **click-and-collect**
- Higher diversity of e-consumers: poor and rich, rural and urban, old and young, women and men

Le Monde

ÉCONOMIE

Favoris ★

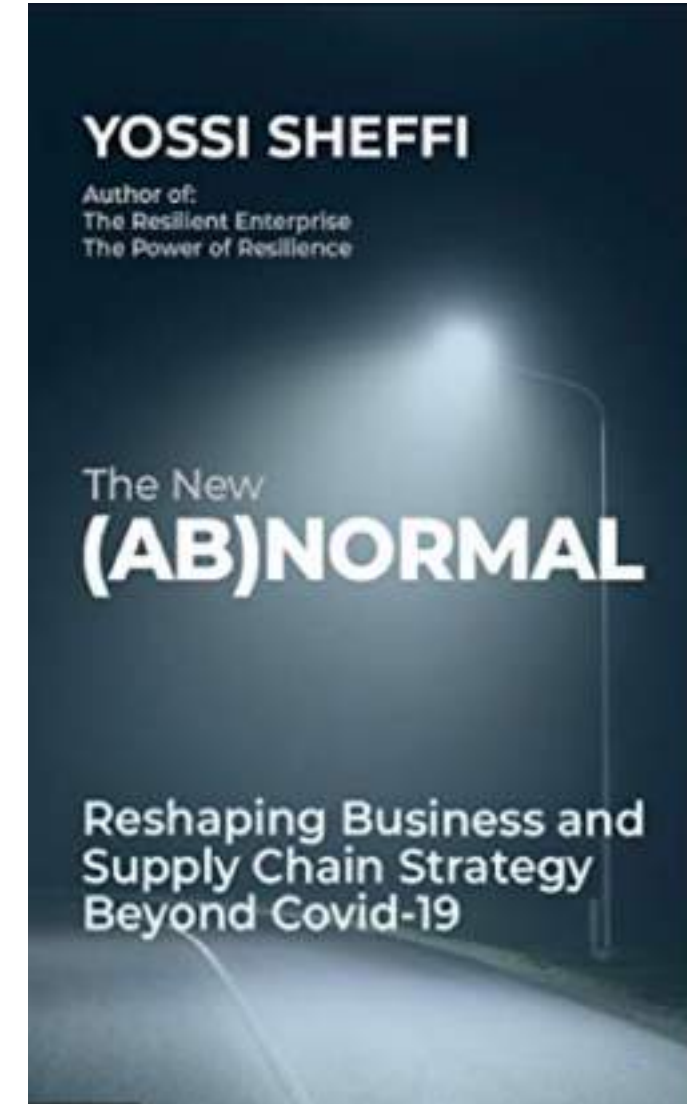
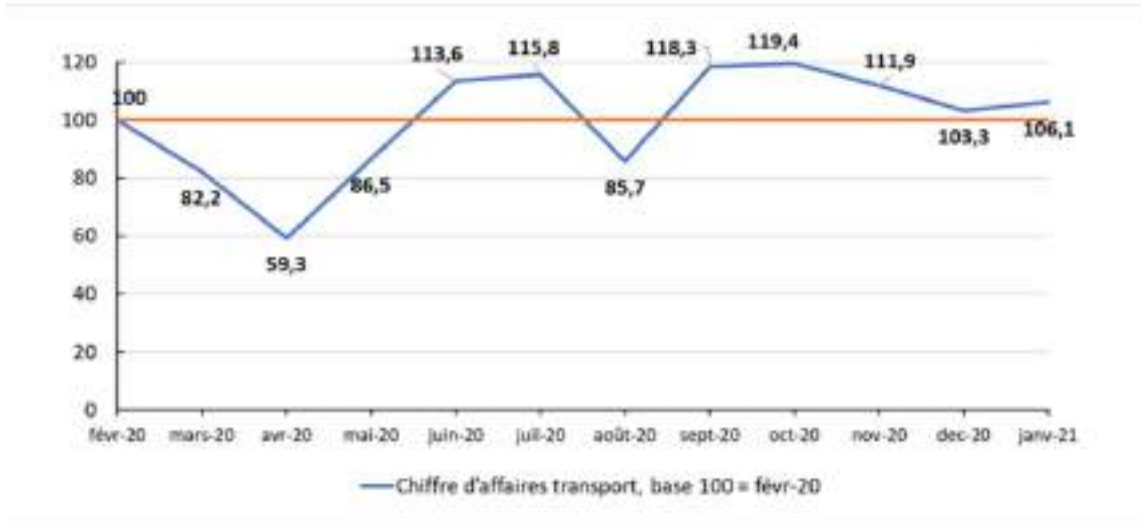
Covid-19 : la logistique, un secteur devenu incontournable

La pandémie a mis en exergue le rôle des chauffeurs et livreurs dans la bonne marche de l'économie.

Par Eric Béziat et Julien Bouissou

Covid has been an accelerant of trends in logistics service provision

- Goods movement and logistics services **resilience**
- Truck transport has recovered
- Key role of **technologies** uptake



A huge impact on on-demand instant delivery services

- DoorDash bookings (world) in 2020: +198%
- Meituan market valuation in May 2021: \$210 bil
- Postmates sold to Uber in 2020 for \$2.65 bil
- Deliveroo IPO disappointing, labor issues



Partnerships formed between instant delivery platforms and major grocery chains

Carrefour and UberEats, April 2020

Casino and Deliveroo, May 2020

Carrefour and Deliveroo, April 2021

Carrefour and UberEats for 20 min delivery, May 2021

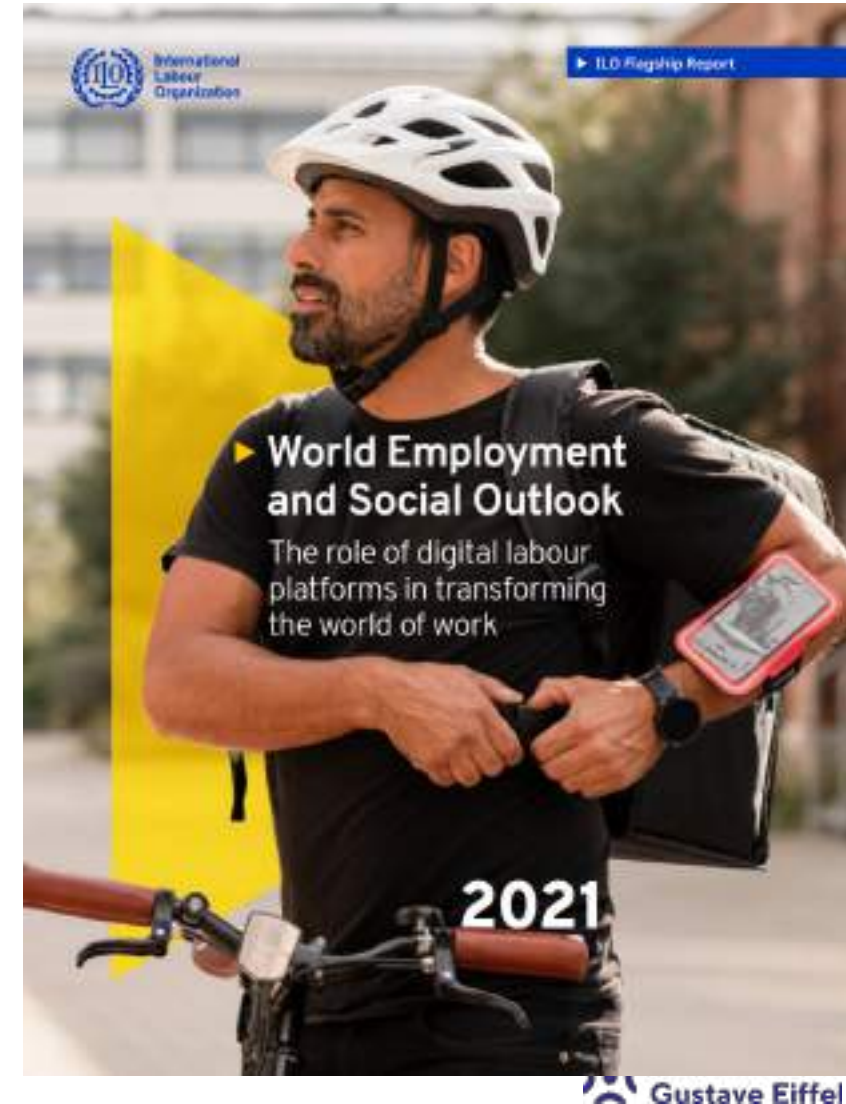
Court decisions accelerated

- Several court decisions have required on-demand delivery platforms to compensate couriers for lost benefits as they should have been considered employees rather than independent workers
- California Supreme Court, 30 April 2018 and California judge Sept 2021; French Cour de Cassation March 2020; Spanish Tribunal Supremo September 2020; British Supreme Court February 2021; Italian Procura di Milano February 2021, Amsterdam Justice Court Sept 2021

A new issue for litigation: algorithms

ILO, 2021

- July 2021: Italy's data protection agency fined Glovo-owned food delivery company Foodinho €2.6m over the way it used algorithms for managing its delivery workers
- It found violations of labor and privacy laws



Autonomous deliveries: marketing approaches using COVID challenges

JD in Wuhan and Baiyang lake, Hebei



Rappi, Medellin,
Colombia



Starship Technologies, Co-op
grocer in Milton Keynes, UK



Wing and Nuro

Wing (Google) made 1,000 deliveries in two weeks during first lockdown in Australia, Finland, the US



Nuro in the US for medical supplies



Acceleration of new modes for urban deliveries

100 000
(estimations nombre d'emplois
France compte d'autrui)

70 000

> 3500

>20 000

500-1000

<35 000

<2000

**Livreur en
poids lourd**

**Livreur en
VUL**

**Livreur en
voiture**

**Livreur en
scooter**

**Livreur en
vélo-cargo**

**Livreur en
vélo**

**Livreur à
pied**



A huge increase in cycle-logistics in Paris



International Cargo Bike Festival Groningen

June 14-16th 2019

One of the main advantages:
access to bike lanes (and
'corona-lanes')

Explosion of the number of urban freight companies in France...coming from gig workers

Créations d'entreprise de transport et de logistique dans la métropole de Lyon



Source : Insee - Réalisation : Urbalyon

Accelerated implementation of urban warehouses

- Recycling local shops, car parks or other underused areas into logistics facilities
- Micro-hubs for last mile distribution of parcels and grocery
 - 'Dark kitchens': for meals
 - 'Dark stores': for groceries



Fabric
automated
micro-
fulfillment
center in
Brooklyn,
2021

Four surveys along the pandemic progress

- Surveys during the first lockdown or along 2020 with the views of getting knowledge on urban logistics operations and challenges

Survey 1: 'Barometer of urban logistics in times of lockdown' (Buldeo Rai and Dablanc) March-May 2020, daily survey with a panel of 11 delivery companies operating in Paris

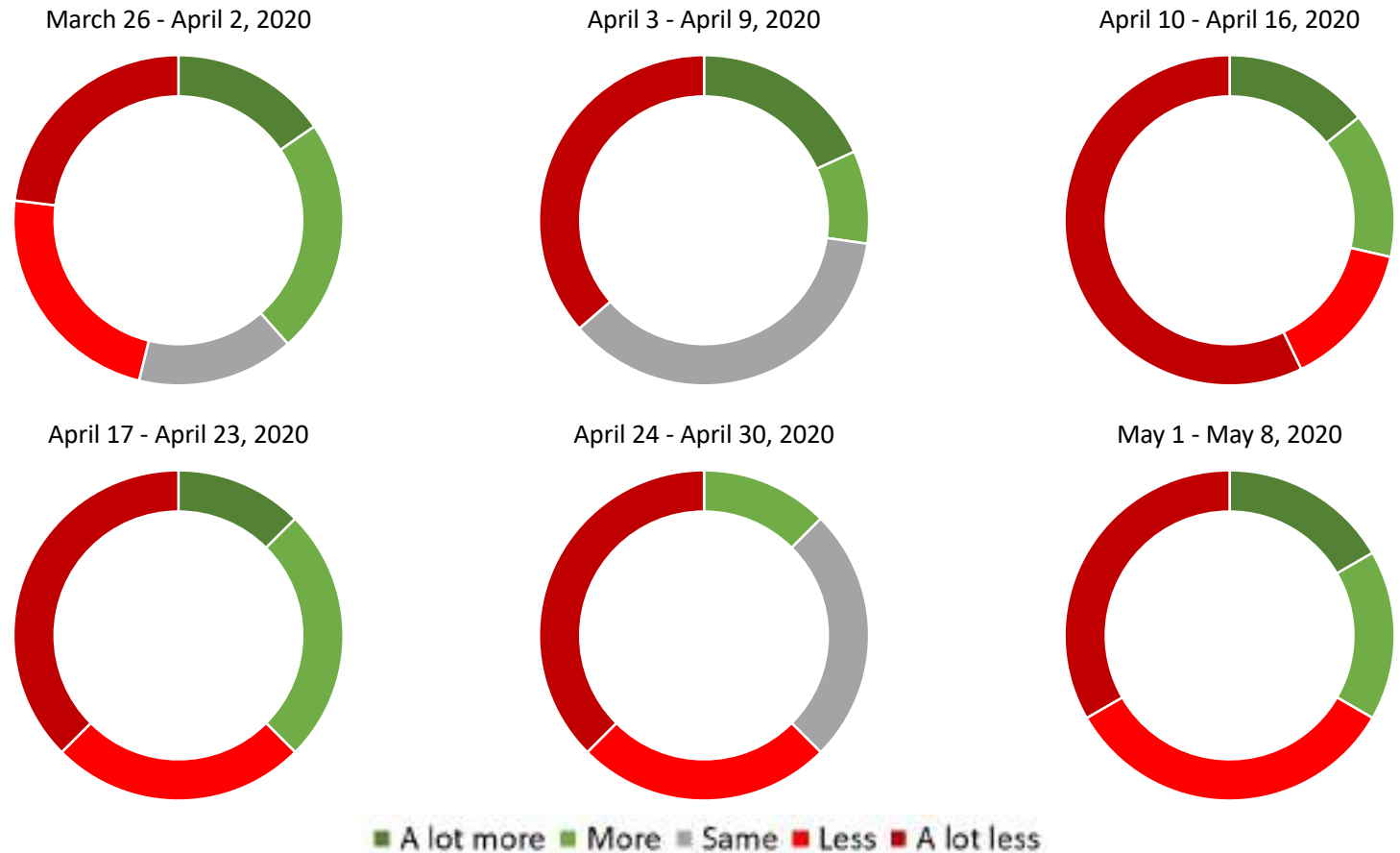
Survey 2: Interviews with stakeholders during the period March-April 2020 (Heitz), 27 semi-directive interviews with third-party logistics providers, shippers and public authorities

Survey 3: On demand instant delivery platforms' gig workers in Paris (Adoue, Aguilera, Dablanc, Krier), February 2021

Survey 4: Monthly survey on main logistics property developers in France (Dablanc and Diziain) in March, April, May, June, September and October 2020

Lockdowns for delivery operators: extreme variability of orders and sectorial economic difficulties

- Flexibility was key

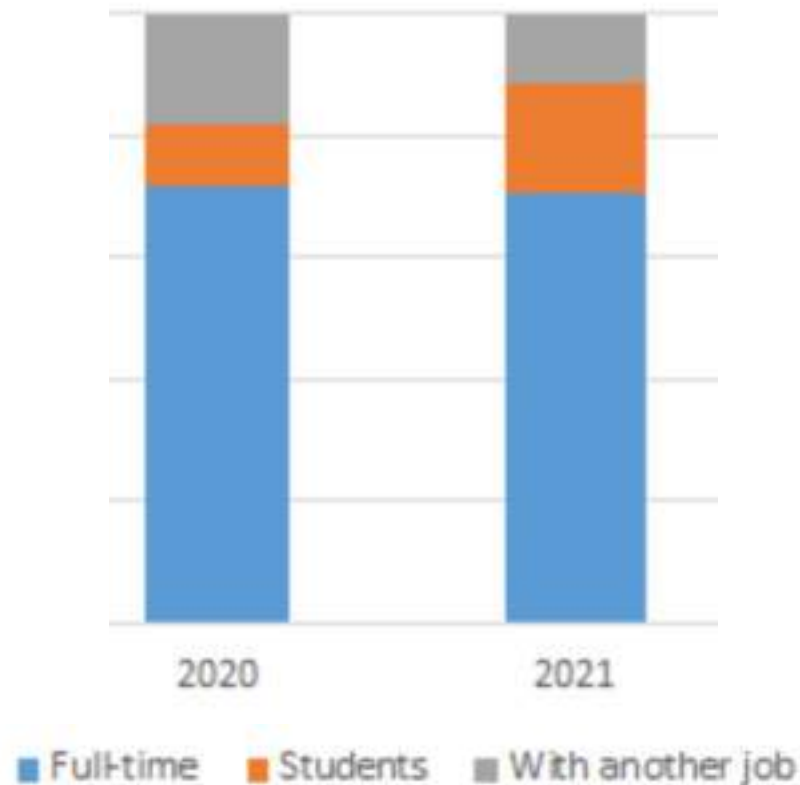


- Freight companies involved in markets not associated with 'essential goods' had to reorganize their activities, find new markets and accelerate shift to BtoC
- Also generating shift in destinations
- Increase in empty returns, deteriorating productivity
- Overall, higher productivity from better traffic conditions was counter-played by less return freight, staff disorganization, more home deliveries (as opposed to deliveries to pick-up points)
- New services helping local farmers to sell their products online and find delivery providers
- New services matching local stores opening a delivery service to logistics start-up companies

Delivery and logistics workers

- An increase in temporary workers in parcel's delivery industry and mass retail sector
 - Many sick or absent workers (due to childcare)
 - Need to respond to the new demand
- A high rate of unemployment in industrial logistics compared with other sectors
- Change in warehouse organization to ensure health safety
 - And ... prevent social movements (Amazon had to shutdown its warehouses in April 2020 because of insufficient protective measures at the request of unions)
- Limited remote working in logistics and transport: high exposure to COVID
- Precarious working conditions increase the vulnerability of workers
 - Northern poor suburbs of Paris where a majority of delivery/logistics workers live: excess COVID mortality

Gig delivery workers in Paris: comparing 2021 to 2020



- More students on the job, reversing a strong trend since 2016
- 34% turned to this activity because of the pandemic (61% among students)
- The pandemic has led to a decrease in income for more than half of delivery workers
- 57% of delivery workers say that the pandemic has worsened their working conditions

Increased use of illegal transport modes: mopeds, cars and electric shared-bikes

2020

60% bicycle

31% mopeds

0% cars

2021

47% bicycle

36% mopeds

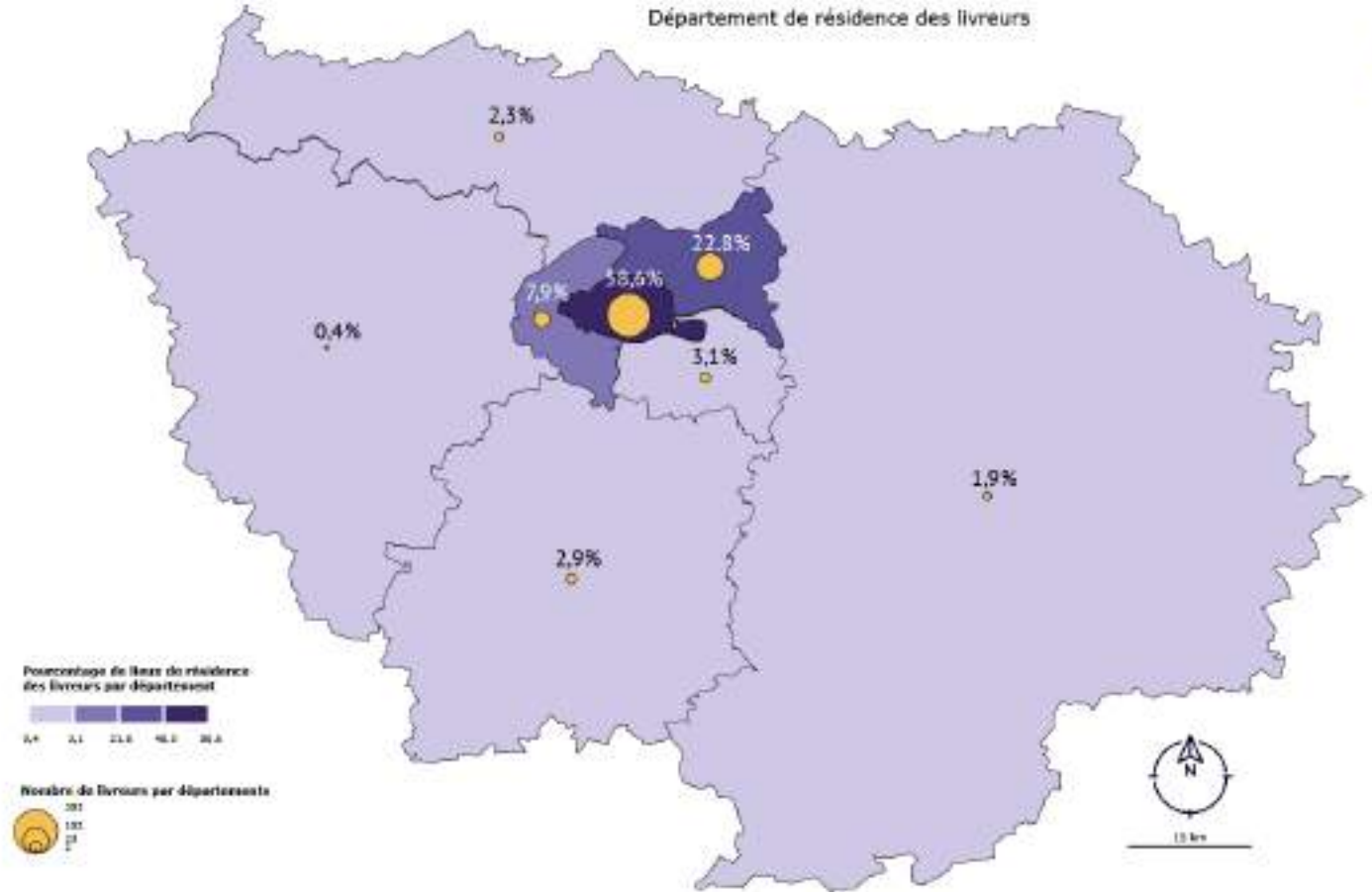
7% cars

⇒ Increased use of motor vehicles:
(strictly regulated in French legislation)
=> Increased use of bike and scooter
sharing (not allowed for deliveries)



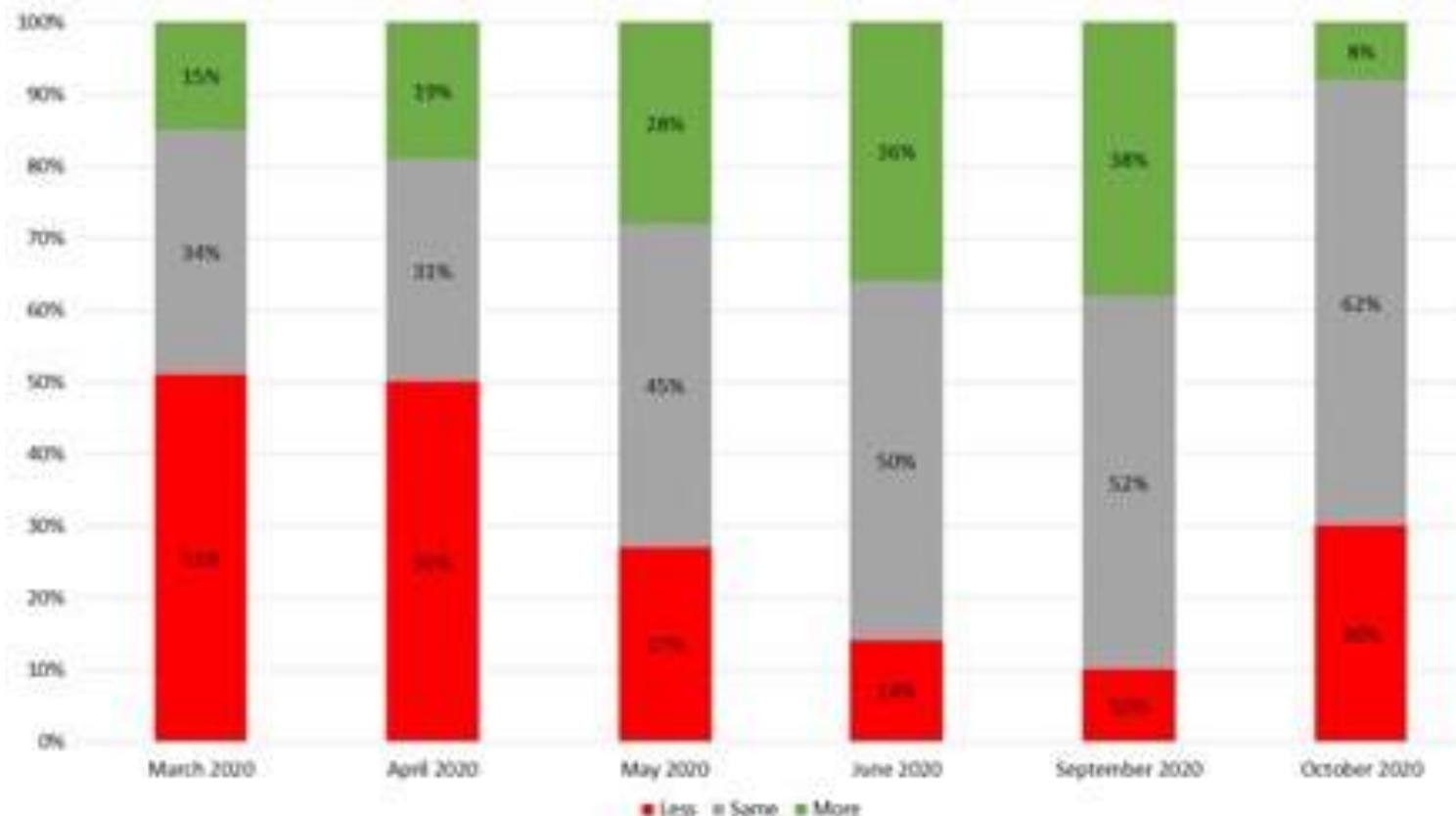
Commuting to the work place (2021)

- 62% with vehicle used for deliveries (bike or moped or car)
- 16% in public transit, with bike
- 13% in public transit
- 9% other



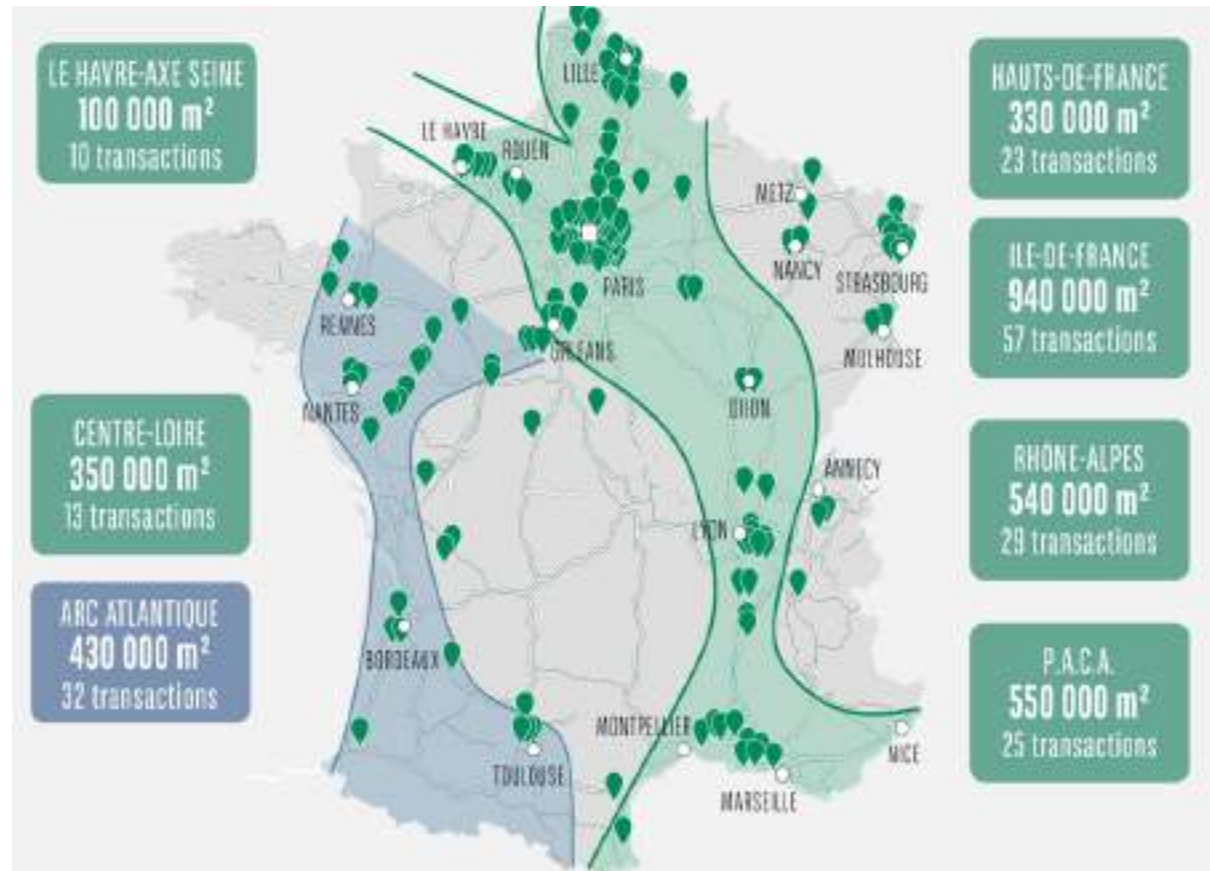
Logistics real estate market did well in 2020

- Logistics real estate was in a very good shape before the first lockdown
- The first lockdowns generated major but short-term challenges
- Activities recovered and overall activity has decreased by only 7% in 2020 compared with 2019 which was an exceptionally good year



The evolution of warehousing activity levels, as estimated by AFILOG members compared to "normal" times (Dablanc, Diziain, 2021)

Less concentration of logistics development in the largest four metro areas (Lille, Paris, Lyon, Marseille) in 2020



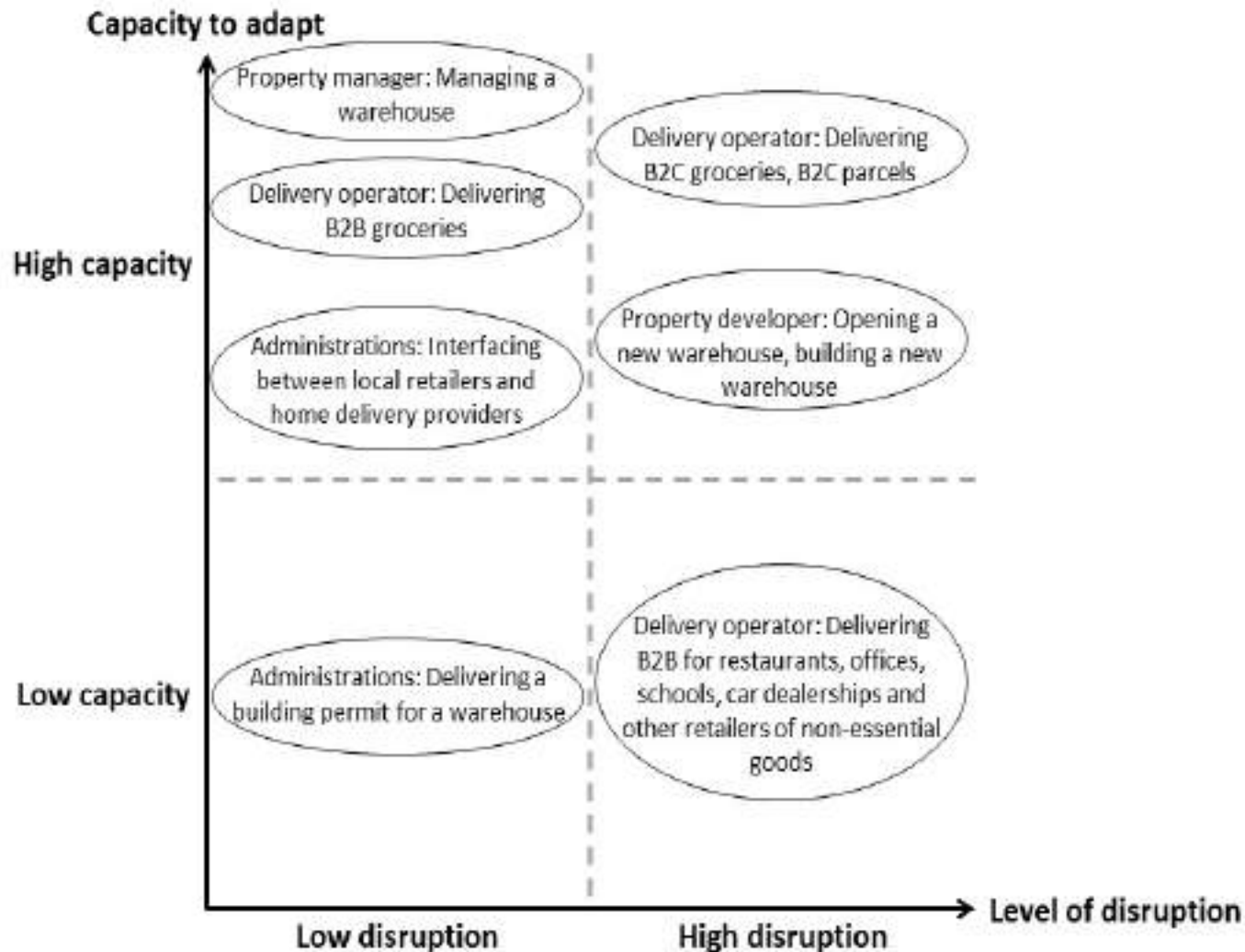
(ImmoStat/BNP Paribas Real Estate)

Mood changes from logistics real estate stakeholders

Survey month	Key feedback
March 2020	Strong adaptability , uncertainties and worries but optimism despite everything
April 2020	A gradual recovery but aggravated administrative bottlenecks
May 2020	A strong recovery and the catching up of accumulated backlogs, but progress risks being blocked due to persistent or even worsening administrative delays.
June 2020	Confirmation of a strong recovery and catching up on accumulated delays, but progress continues to suffer from administrative delays and the uncertainties for 2021 and beyond are very real
September 2020	Confirmation that the year 2020 should be rather good but concerns for 2021; progress continues to suffer from event cancellations and administrative delays
October 2020	Confirmation that the year 2020 should be rather good, but costs and complications related to staff and site reorganizations and persistent administrative delays; concerns for 2021 due to missed opportunities following event cancellations, uncertainties and a slowdown in calls for tenders. More diffuse concerns about the sector's image with the general public and an "anti-Amazon" sentiment.

Dablanc, Diziain,
2021

Overall: various levels of challenges and adaptability



Recycling under-used urban spaces and brownfields



- Former **gas-station** in Paris (project)



- Empty space **under the Paris ring-road** (finalized in December 2020)

Policy response to COVID in French cities

- Quick responses to urgency at the local level during lockdown
- Municipalities' websites identifying stores proposing home delivery

Paris website has identified and mapped more than 1000 local retailers



<https://vivrep.paris.fr/paris-tous-les-commerces-qui-livrent-sur-une-carte-interactive/>

Policy response, longer term

- Logistics omitted from several post-lockdown initiatives
 - Reorganization of street space to invent a “different urban world” (Mayor of Grenoble)
 - “tactical urbanism”: change quickly, cheaply and temporarily the use of space in cities
 - Paris 50 kilometers of “corona-lanes”
- 2021: emerging strategies to accommodate new logistics operations
 - Cargo-cycle dedicated delivery areas
 - Mobile micro-hubs allowed on city streets
 - Exemption of on-street parking pricing for electric motorcycles and mopeds

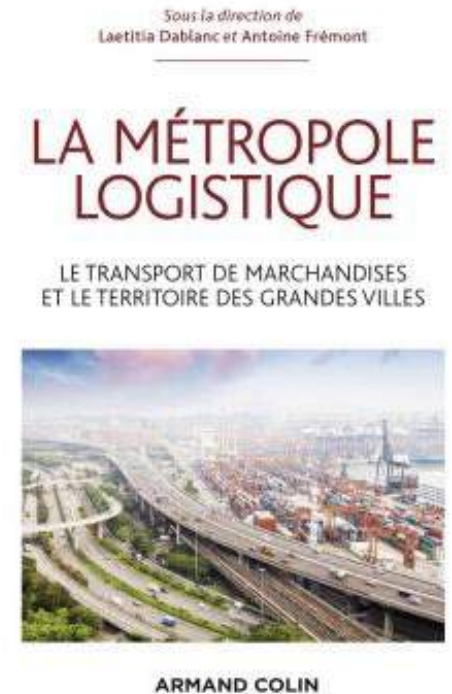


Conclusion : urban logistics in a post-pandemic world

- Accelerating the use of some **technologies**
 - easier to get authorizations for testing automated delivery vehicles such as robots and drones
 - new enforcement tools (plate number recognition cameras) ready for deployment
 - Discussions on new methods for urban freight data and data sharing
- Improving the situation of **gig workers** for on-demand instant delivery platforms
- Accelerated implementation of **low and zero emission zones**, with one issue now disputed between local decision-makers and freight operators: the status of trucks in the new traffic restrictions

Ressources

- LOGISTICS CITY CHAIR: www.lvmt.fr/en/chaieres/logistics-city-sogaris/
- World Conference on Transport Research <https://www.wctrs-society.com/>
- METROFREIGHT www.metrotrans.org/metrofreightw.metrotrans.org/metrofreight
- Browne, M., Behrends, S., Woxenius, J., Giuliano, G., Holguin-Veras, J. *Urban logistics. Management, policy and innovation in a rapidly changing environment*. Kogan Page, London
- Urban Freight Lab: <https://depts.washington.edu/sctlctr/urban-freight-lab-0>
- CITYLAB (2018) Observatory of Strategic Developments impact urban logistics http://www.citylab-project.eu/deliverables/D2_1.pdf
- Urban freight platform:
<https://www.chalmers.se/en/centres/lead/urbanfreightplatform/Pages/default.aspx>



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