Chapter 10
Changing Cycling Practices and Covid Cycle Lanes in Five French Cities

Nathalie Ortar ⓘ**, Laurent Chapelon** ⓘ**, Sandrine Depeau, Benoît Feildel** ⓘ**,
Adrien Lammoglia** ⓘ**, Adrien Poisson** ⓘ**, David Sayagh** ⓘ**, Léa Barbé,
and Andoni Hentgen-Izaguirre**

Abstract To encourage a modal shift toward cycling during and after the 2020
lockdown the French national government introduced a €120 million budget set
of financial incentives, the "coup de pouce vélo." Meanwhile, inspired by tactical
urbanism, city authorities created cycle lanes and tracks, called "coronapistes" (Covid
cycle lanes), on a permanent or pop-up basis. This response to the pandemic was
driven by a unique set of spatial, social, and political configurations. In this chapter,
we analyze the way in which both experienced and novice cyclists made use of
the temporary facilities that were introduced in the early months of the Covid-19
pandemic in four cities—Grenoble, Lyon, Montpellier, and Rennes—and contrast

N. Ortar (✉)
Laboratoire Aménagement Economie Transports, ENTPE, 3 Rue Maurice Audin, 69120
Vaulx-en-Velin, France
e-mail: nathalie.ortar@entpe.fr

L. Chapelon · A. Lammoglia · A. Poisson · A. Hentgen-Izaguirre
Laboratoire de Géographie et d'Aménagement de Montpellier (LAGAM), Université Paul-Valéry
Montpellier 3, Route de Mende, 34199 Montpellier, France
e-mail: laurent.chapelon@univ-montp3.fr

A. Poisson
e-mail: adrien.poisson@univ-montp3.fr

S. Depeau · B. Feildel · L. Barbé
Université Rennes 2, Place du Recteur Henri Le Moal, CS 24307, 35043 Rennes Cedex, France
e-mail: sandrine.depeau@univ-rennes2.fr

B. Feildel
e-mail: benoit.feildel@univ-rennes2.fr

D. Sayagh
Université Paris-Saclay—UFR STAPS, 335 Rue Pierre de Coubertin, 91440 Bures-Sur-Yvette,
France
e-mail: david.sayagh@universite-paris-saclay.fr

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this with the case of Saint-Étienne, where the Covid cycle lanes were removed at the end of the spring 2020 lockdown. The chapter aims to observe the effects of public policies on cycling practices and the social representations associated with them, in particular on changes in use in contexts characterized by different relationships to cycling. To capture the ways in which the Covid cycle lanes have been received and used, we employed ride-along interviews, an in situ and qualitative mobile method.

10.1 Introduction

Since the early 2000s, cycling has gradually evolved from leisure or sports activity into a utilitarian means of transport (Aldred and Jungnickel 2012) in countries where cycling as part of everyday life had almost died out (Buehler and Pucher 2021). The Covid-19 pandemic accelerated this comeback and in French urban areas this trend continued into 2021 (Vélo and Territoires 2021). Utility cycling is thus becoming both a legitimate practice and a credible alternative to driving in urban areas, although cars continue to dominate both the public space and public policy (Cox 2020). In this modal shift, infrastructure matters, as "the type and quality of bike infrastructure are of importance: stated and revealed-preference studies suggest that cyclists prefer separation from motorised traffic and bad pavement quality can deter them from cycling." (Buehler and Dill 2016). It is therefore necessary to pay attention to the design of infrastructure, their continuity and the routes offered, which represent as many elements of inclusion as of exclusions (Cox 2019). However, building cycling infrastructure is not just a matter of providing physical spaces. They are about building meaning between objects and humans that unfolds in the course of the interaction (Dant 2008). They are therefore also of building the skills, competencies, and confidences required for moving in public spaces (Cox 2020; Adam and Ortar 2022) that are at the core of a cycling culture.

To encourage a modal shift toward cycling during and after the spring 2020 lockdown, and with a view to counteracting the anticipated increase in car use as a result of the pandemic, the French national government introduced a €120 million budget set of financial incentives, the "coup de pouce vélo." The flagship measure was the funding of a €50 bike repair voucher to individuals to help them have their bicycles serviced, the other one was periods of education and training to become proficient at urban cycling (called "getting back in the saddle") (also see Chap. 4). More than 1.7 million bicycles have been repaired, nearly 6000 people have been back in the saddle, and 15,000 temporary parking lots have been put into service.[1] Some metropoles also offered a €500 voucher when buying an electric bicycle. This was not a new measure, it had been in place for several years on a limited budget, but

[1] https://www.fub.fr/fub/actualites/bilan-operation-coup-pouce-velo-resultats-etude-opinionway.

it was updated during the pandemic. Meanwhile, city authorities, inspired by tactical urbanism, created cycle lanes and tracks, called "coronapistes" (Covid cycle lanes), on a permanent or pop-up basis (see Chap. 3 for an analysis of the conditions of their creation). This response to the pandemic was thus driven by a unique set of spatial, social, and political configurations.

In this chapter, we analyze the way in which both experienced and novice cyclists made use of the temporary facilities that were introduced in the early months of the Covid-19 pandemic in four cities—Grenoble, Lyon, Montpellier, and Rennes—and contrast this with the case of Saint-Étienne, where the Covid cycle lanes were removed at the end of the spring 2020 lockdown. The cities have been chosen because they were both interesting in terms of cycling policies and ridership evolution but also, very pragmatically, where we were present and able to conduct research despite the several lockdowns experienced over the period. By doing so, we aim to observe the effects of public policies on cycling practices and the social representations associated with them, in particular on changes in use in contexts characterized by different relationships to cycling: Grenoble has had one of France's highest cycling rates for several decades (see further Table 10.1); in Lyon, Montpellier, and Rennes, utility cycling is making a major comeback; and in Saint-Étienne the modal share of cycling remains almost non-existent. This comparative approach is designed to help explain changes that we consider to be fundamental, and to shed light on the concept of bikeability.

Bikeability is defined by a combination of objective and subjective factors, and incorporates concepts such as bicycle comfort, suitability, friendliness, and accessibility (Kellstedt et al. 2021; Reggiani et al. 2021). It measures the extent to which an environment is safe and convenient for cycling and is worked and modeled in connection with the Design Manual for Bicycle Traffic, edited by CROW (2017). Thus, even in the context of utility cycling, cyclists' preference for different routes is determined by their preferred infrastructure: while some are happy to take a longer but safer and more comfortable route, others consistently favor more direct and thus shorter routes (Larsen and El-Geneidy 2011; Cox and Koglin 2020). Indeed, cycling is sensitive to the type of infrastructure (particularly in its cohabitation with motorized traffic, its volume and speed). Moreover, the cities that have a significant bicycle modal share (more than 15–20%) are also those that have developed their roads accordingly (or reduced the volume and speed of motorized traffic). According to a literature review published by Arellana et al. (2020), bikeability indices are based on comfort and safety indicators that are themselves indexed to the type (or presence) of bikeable infrastructure.

Socialization also plays an important role in the choice of modes and in the construction of mobility strategies (Müggenburg et al. 2015 for a literature review). Socialization is the process that defines the individual as a social being constructed in the diversity of her/his systems of social interaction and membership in social groups. The process of socialization defines as much the modalities of transmission of norms of values by the different environments of life of the individual as the modalities of learning or internalization of these norms and schemes of thoughts by the individual (Darmon 2006). The literature has shown that the initial learning of biking and

Table 10.1 Characteristics of the field sites, by city

Field site	Grenoble-Alpes Métropole	Grand Lyon	Montpellier Méditerranée Métropole	Rennes Métropole	Saint-Étienne Métropole
Number of communes	49	59	31	43	53
Population on January 1, 2018	445,059	1,411,571	481,276	451,762	404,607
Population density	816 inhabitants/ km^2	2645 inhabitants/ km^2	1141 inhabitants/ km^2	640 inhabitants/ km^2	559 inhabitants/ km^2
Modal share of cycling (%)	7.0	3.6	4.1	5,4.0	1.0
Cycle network (km)	450	800	160	800	110
Temporary infrastructure	18 km (made permanent)	77 km (mostly made permanent)	22 km (mostly made permanent)	23 km (made permanent)	30 km (removed)
Specific features			Roads with two lanes in both directions changed to a two-lane road on one side and a single-lane road on the other + a cycle lane or shared bus and cycle lane. Priority given to serving the biggest generators of traffic (hospitals, universities, etc.)	Cycling street ("vélorue") created. Peri-urban sections installed as part of the Réseau Express Vélo (REV, Cycle Express Network)	

Sources INSEE (2022)

continuous experience of it increasingly influence the skills of urban cyclists and build their identity as cyclists (Aldred 2013). Changes in spatial organization (new infrastructure, new regulations) or transport policies (incentive or restrictive measures) and individual behavior are also determining factors for adopting or abandoning the practice (Cox and Koglin 2020).

Becoming an urban cyclist builds thus on an individual socialization largely dependent on the material world, whether this is the immediate geophysical environment, the available infrastructure, or the characteristics of the socializing object (Abord

et al. 2021; Adam et al. 2022). Cycling requires the acquisition of specific skills (Adam and Ortar 2022; Hull and O'Holleran 2014), particularly in relation to dealing with motorists, and is also characterized by changes in the frequency or nature of use (leisure, sport, or utility) and by periods of stopping and starting (Chatterjee et al. 2013; Janke and Handy 2019; Marincek and Rérat 2021; Marincek 2022). These may result from material conditions, family roles (Bonham and Wilson 2012; Sayagh 2018), and workplace or home location (Adam et al. 2022). Moving house, changing jobs, or the birth of a child—defined as key events or turning points—can lead to changes in mobility decisions (Müggenburg et al. 2015; Chatterjee et al. 2013) and thus on travel routines such as children's travel behaviors during school transition. But other factors considered as "exogenous intervention" (including the pandemic crisis and its effects on road design, the transportation system) may also contribute to the evolution of mobility patterns. Cycling practices are thus the product of interactions in time and space, and of the way these materialize in the lives of individuals (Nello-Deakin and Nikolaeva 2021; Cailly et al. 2020) and determine their practice (te Brömmelstroet et al. 2020; Adam et al. 2022).

The pandemic brought about a number of concurrent changes in France: a lockdown that for many people was accompanied by a change of everyday travel practices due to the requirement to work from home for all or part of the week; the long-term closure of sports facilities and leisure centers; a set of public policies; and the expansion of cycling infrastructure. To understand the changes introduced by the new infrastructure, we postulate, following Akrich (1992, 222) that technical objects have social agencies and through it a political power. They modify social relations. As stated by Peter Cox: "as infrastructure opens up some paths of action, it also closes down other possibilities. This increase and decrease of possibilities affect people differently" (Cox 2020: 18). This helps us to understand how movements and contingencies born of design (Sheller and Urry 2000) produce a different relationship to space and mobility in particular, when this design is initially part of a dialectical system involving a dominant car system facing an emerging bicycle system seeking to get a readership in order to become a normalized practice (Rérat 2021a). Following te Brömmelstroet et al. (2020), we ask how the practices of cyclists, and their experience of everyday cycling, may have been changed by the creation of new infrastructure, and examine the potential ripple effects among individuals who did not practice utility cycling prior to the pandemic. We thus explore the ways in which the context of the Covid-19 pandemic catalyzed a modal shift and facilitated the learning process for novice cyclists, children for instance, whose ability to cycle independently constitutes a robust foundation for sustainable travel practices (Depeau 2012).

The findings presented in this chapter are taken from the Vélotactique research study,[2] which aimed to shed light on the political contexts in which the Covid cycle lanes were created (see Chap. 3), to produce a dynamic map that reflects their diversity and evolution (see Chap. 8), and also, as discussed in this chapter, to understand how cyclists perceive and use them. After presenting the study fields and the methodology

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[2] Research programme ANR20-COV7-0007.

used by the Vélotactique survey, we consider a few aspects of the socialization and effective practices of cyclists interviewed before and during the pandemic, and then analyze how cyclists have utilized the infrastructure.

10.1.1 Study Fields

Since 2020, Grenoble has been considered the cycling capital of France by the Baromètre des villes cyclables (Bikeable Cities Index). The modal share of cycling in the city is of 17.44%[3] (INSEE 2022), and its 18 km of Covid cycle lanes were added to an existing 450 km of cycle lanes. In Lyon the cycling modal share in the city is of 8.77% (INSEE 2022). The number of cyclists has been steadily growing for several years (by around 20% per year). In the spring of 2020, 77 km of Covid cycle lanes were created in the city, joining its existing 800 km of cycle lanes. In Montpellier, the modal share of cycling is relatively low (4.1%), but data from permanent cycle counters show a significant increase in cycling in recent years (+ 14.9% between 2021 and 2022). The city's 22 km of Covid cycle lanes were created by removing car lanes. In Rennes, the modal share (observed from census data 2019, about commuting to and from work, INSEE 2022) is of 10.15%, but cycling evolved weakly between the two French Household Travel Surveys (5.5% in 2007 and 5.4% in 2018, Audiar 2019). Between 2019 and 2021, however, the city's transport department observed a 66% increase in cycling, which it attributed to the pandemic and interpreted as validating the political actions it had taken. By the end of 2021 Rennes had added nearly 23 km of cycle tracks to its network, making it France's third most bikeable city. Saint-Étienne is hilly and has a fragmented cycle network. The modal share of cycling is around 1%. In May 2020, 30 km of Covid cycle lanes were installed in the city but most of them had been removed a month later.

10.1.2 Methodology

To capture data on cyclist behavior, we employed an in-situ and qualitative mobile method inspired by the walk-along interviews (Thibaud 2001) but transposed and adapted to cycling. This method, trickier to apply to cyclists than to pedestrians, consisted of setting up a remote tracking mechanism, with the interviewer following the interviewee while filming them using an action camera.

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[3] For Grenoble and the following cities, the modal share is expressed as a percentage of all home-work trips: here, it represents those made by bicycle and/or Electrically Assisted Bicycle—EAB, in the central city only (INSEE 2022), see the table below for the modal share expressed in the metropole.

These ride-along interviews were produced to capture, as closely as possible to lived experience, the ways in which the Covid cycle lanes have been received and used. The aim was to gain a better understanding, based on a "perception in motion" approach (Thibaud 2001), of the conditions—individual, social, technical, and material—for the use of urban public space, and in particular of cyclists' relationships with their environment and with other road users in the context of everyday travel. This meant generating specific examples relating to the Covid cycle lanes. If the interviewee's usual route did not include one, an alternative route could be proposed. There was, however, some leeway in this instruction, and to ensure that the interviewees felt safe, tracking on the Covid cycle lanes sometimes had to be abandoned.

Each journey was made by an interviewer and an interviewee, with the first phase consisting of a cycle ride, and the second phase of a self-analysis and video-elicitation interview (Adlakha et al. 2002) based on the recording of the journey (Diagram 10.1). The video-elicitation interview, which has similarities with "the test of reality" (Martouzet et al. 2010), aims to elicit a "discourse of existence" (Chalas 2000) by mobilizing the interviewee's powers of reflection in order to access their representations of travel practices (Bailleul and Feildel 2011). The videos were used to encourage reflection on cycling practices and to elicit a situated discourse, designed to interrogate practices, representations of the road environment, the material conditions of the journey, and finally the relationship between conditions and practices. These interviews helped to explain certain aspects of the relationship with the city, cycling, and urban cycling. The commentated cycling journey, filmed and watched back, enabled us to capture the sensory and motor activities of the observed cyclists as closely as possible, and to understand these through the commentaries of the interviewees themselves. During this stage, interviewees were asked to comment on what they saw as if they were riding, and to point out things that surprised them. To supplement and contextualize this experiential data, information was also gathered on the interviewee's biography and personal cycling history.

Around ten journeys and interviews were conducted for each of the field sites, with a total of 48 interviewees. These cyclists varied in terms of their age, gender, how long they had been cycling and the types of journeys they made in an everyday cycling context, their home location, workplace location, and whether they had made
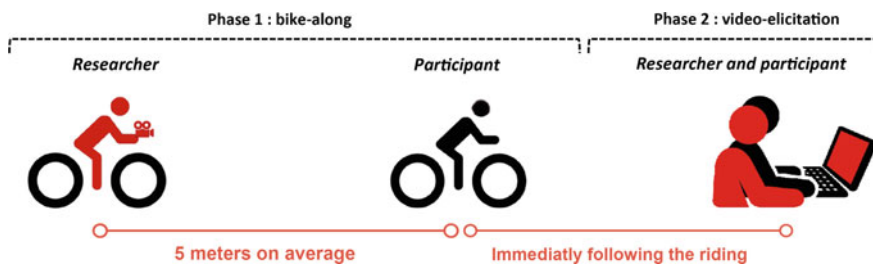

Diagram 10.1 Bike-along and video-elicitation interviews protocol. *Credit* Benoît Feildel

use of the financial incentives introduced during the spring 2020 lockdown (see Table 10.2). Their diverse profiles enabled the commentaries to cover a broad range of practices and infrastructure which has enabled us to investigate a broad range of cycling practices in relation to particular socio-spatial environment and set of policies and self-reported levels of cycling experience.

Table 10.2 Participants in each city by age, gender, level of cycling experience, and socio-occupational categories

Field site	Grenoble-Alpes Métropole		Grand Lyon	Montpellier Méditerranée Métropole	Rennes Métropole	Saint-Étienne Métropole	Total
Number of interviewees	8		11	14	9	6	48
Sex							
Female	5		9	6	3	3	26
Male	3		2	8	6	3	22
Age							
Under 15	0	1	0	0	0		1
15–24	1	1	5	3	0		10
25–64	7	9	9	6	5		36
65 and more	0	0	0	0	1		1
Occupations and socio-occupational categories							
Executives and higher intellectual occupations	4		4	6	3	3	20
Intermediate occupations	1		3	2	2	1	9
Employees	2		2	0	1	1	6
Retirees	0		0	0	0	1	1
Other persons, not in employment	1		2	3	3	0	9
Information not provided	0		0	3	0	0	3
Self-reported level of cycling experience							
Limited experience	1		2	2	2	1	8
Moderately experienced	3		2	2	2	4	13
Very experienced	4		7	10	5	1	27
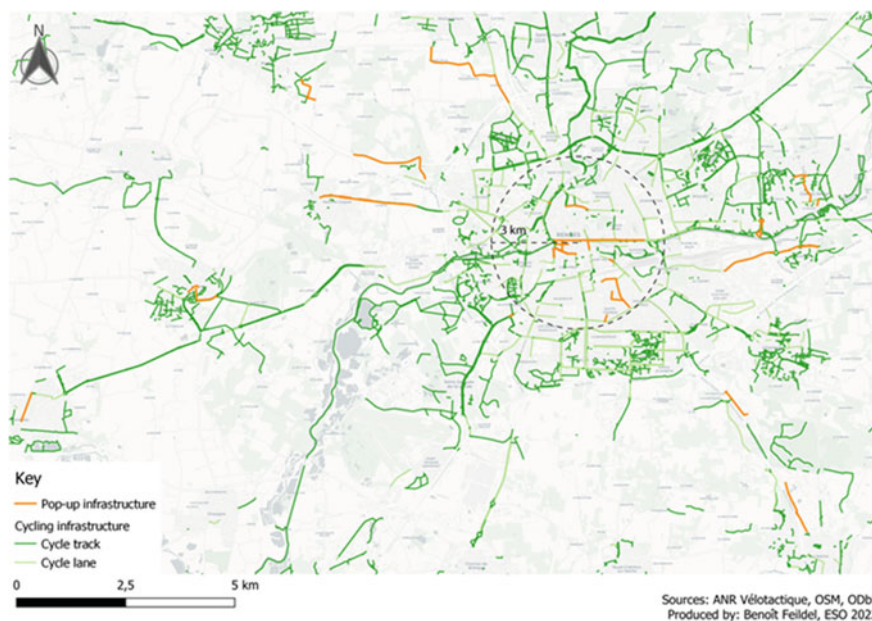
Fig. 10.1 Location of cycling infrastructure in Rennes

The commentated journey maps produced for the Rennes (Figs. 10.1 and 10.2) and Montpellier (Figs. 10.3 and 10.4) field sites illustrate the diverse range of practices observed, whether in terms of the distance traveled, the spatial imprint of the routes, or the Covid cycle lanes used. These maps also illustrate the disjointed nature of the Covid cycle lanes, and the way in which these connect to the overall route of the interviewees (see Chap. 8 for a full description of the pop-up infrastructure in the various cities studied).

In Montpellier, where the pop-up network is very fragmented, the initial plan was to achieve a modal shift from public transport to cycling in the Hôpitaux-Facultés district, where the main generators of traffic are located, but not enough was done to plug the gaps in routes (see orange line on Fig. 10.3). The commentated journeys were mainly made in this district and in neighboring districts, particularly near L'Écusson (the historic, largely pedestrianized city center), with only two journeys made in the southeastern corner of the city.

10.2 Cyclists' Practices Before and Since the Pandemic

In line with previous studies of the socialization of cyclists in France (Adam et al. 2022; Sayagh et al. 2022), the interviewees reported having learned to ride a bike in childhood, gradually, and typically without regular utility cycling. However, at the
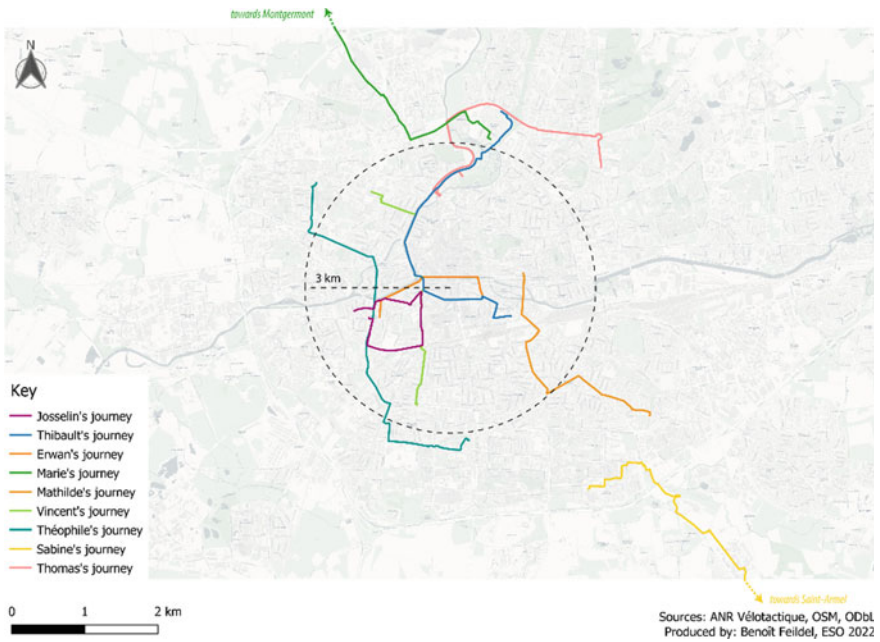
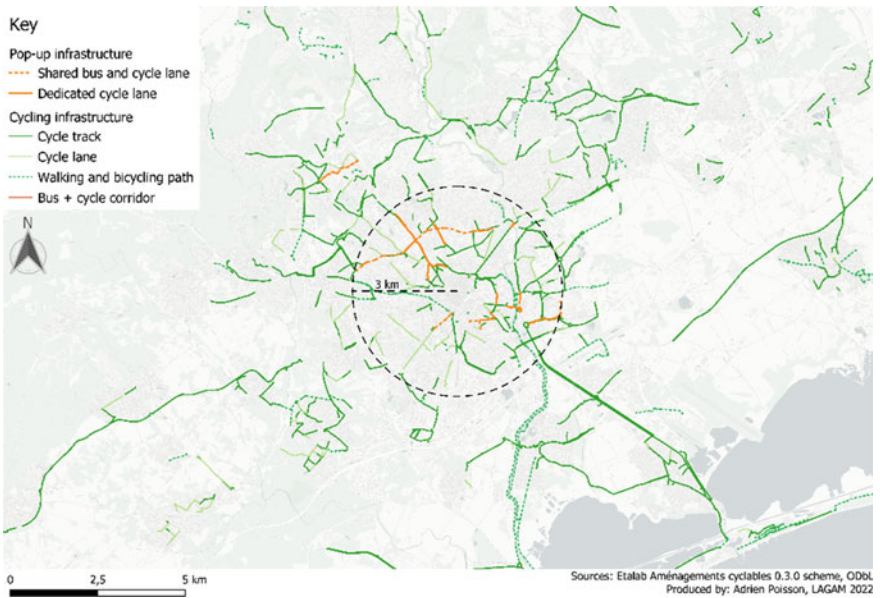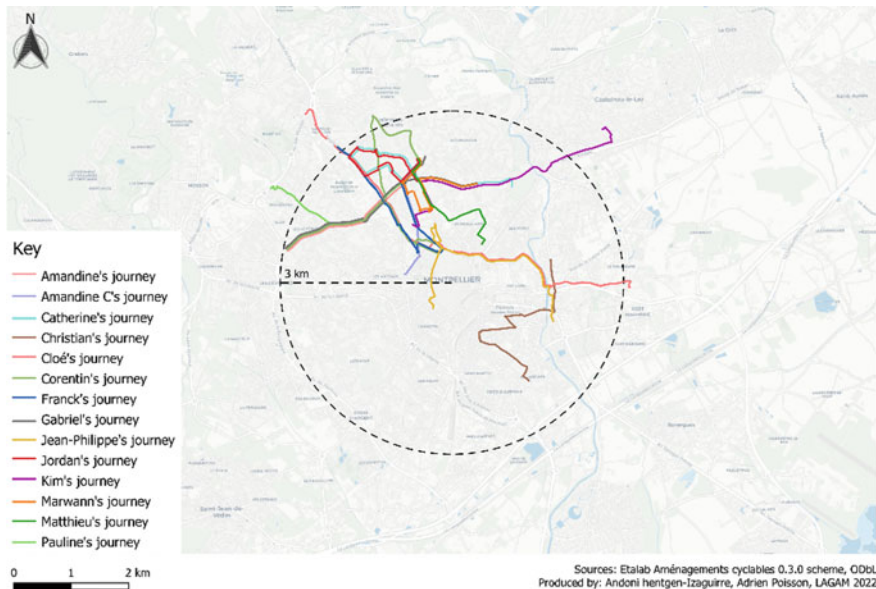**Fig. 10.2** Commentated journeys in Rennes, showing individual routes

Fig. 10.3 Location of cycling infrastructure in Montpellier

Key

— Amandine's journey
— Amandine C's journey
— Catherine's journey
— Christian's journey
— Cloé's journey
— Corentin's journey
— Franck's journey
— Gabriel's journey
— Jean-Philippe's journey
— Jordan's journey
— Kim's journey
— Marwann's journey
— Matthieu's journey
— Pauline's journey

0   1   2 km

Sources: Etalab Aménagements cyclables 0.3.0 scheme, ODbL
Produced by: Andoni hentgen-Izaguirre, Adrien Poisson, LAGAM 2022

Fig. 10.4 Location of the commentated journeys in Montpellier

time of the study, most of the cyclists had already been utility cycling for several years although not necessarily on a daily basis (see Table 10.2, they are the self-reported very experienced and moderately experienced cyclists). They had adopted this practice primarily for practical reasons (due to the speed of cycling compared to other modes of transport), and continued it because they enjoyed it, due to health concerns (before and since the pandemic), and for environmental reasons. The lower cost of cycling was also occasionally mentioned in our interviews, particularly by young cyclists with constrained finances.

10.2.1 Sharing the Road: Cycling in an Urban Context

The literature (Adam et al. 2022; Popan 2020; Larsen 2017) has shown that strictly following the road traffic regulations might be a source of difficulty for cyclists in a car dominated urban context as it is mostly designed for motorists, the "dominant users" who benefit from clear markings showing how the carriageway should be shared, rules that make interactions with other road users more efficient and the question of who has priority clearer. During the ride-along and video-elicitation interviews, we focused on how the cyclists were dealing with it. Except the cyclists involved in cycling organizations, most of the cyclists were unaware of the evolution of the Road traffic regulations. Most of the interviewees were therefore unaware of the M12 sign allowed since 2012 but introduced for example in Lyon only since 2019, which

indicates that cyclists can go through a red light as long as they give way to other road users. This unfamiliarity with road signs, which is shared by motorists, is also seen in relation to Advanced Stop Lines (ASLs) at junctions, with the legitimacy of this space sometimes questioned due to "unfamiliarity with this measure," as Matthieu[4] (male, Montpellier) observed. The range of situations in which cyclists can find themselves having to circumvent traffic regulations for their own safety or comfort may also, however, motivate them to update their knowledge of the Highway Code and of the responsibility of road users (in the event of an accident). This was the case with one man cycling daily for 5 years in Rennes who, having mentioned his knowledge of cycling signage, said: "…I felt like I had to know about them in case one day I'm involved in a dispute and need to know what to say."

The inadequacies of the Road traffic regulations result in cyclists adopting very different behaviors depending on the level of skill they have acquired through practice (new versus experienced cyclists), and the road layout (such as a traffic light with an ASL). While novice cyclists and women appear to be more conscientious about obeying rules while riding on the streets, they employ a number of tactics designed to keep themselves safe, which result in them using sidewalks or other lanes not assigned to them, or setting off at traffic lights before the green light, a common practice (Rérat 2021b), thinking they are trespassing even in the presence of an M12 which increase their level of uneasiness. More experienced cyclists feel that some of the rules set out in the Road traffic regulations are not only designed with cycling in mind, but actually put them at risk and justify their failure to respect stops or traffic lights, on the grounds of comfort and ease: as a way to ensure continuity along their route (not having to put their foot down) and "save energy." They also use sidewalks and pedestrian crossings as a way to enter traffic when changing direction.

Different types of bike may also help cyclists to save energy: electric bikes, for example, are favored because they make it easy to set off again at junctions, and thus also easier to stop (Ortar 2019; Rérat 2021a; Adam et al. 2022). This was one of the reasons for their popularity among the female interviewees.

The practices of the cyclist interviewees were thus heterogeneous and revealed mobility tactics—previously observed in challenging urban contexts (Larsen 2014; Popan 2020)—, which respond to the dominance of cars and involve non-compliance with the Road traffic regulations.

10.2.2 The Cumulative Impacts of the Pandemic: From Health Crisis to Socializing

Except during the first lockdown, utility cycling was initiated or strengthened during or following the lockdowns. This period saw a significant modal shift from public transport to cycling, which was used by some as a "preventive measure." As such, the cyclists who had started to cycle for utility purposes since spring 2020 were

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[4] All the names have been changed.

predominantly motivated by health concerns: the desire to limit time spent on public transport and to get some exercise during a period of enforced home working for all or part of the week—a situation common to most of the interviewees—at a time when, moreover, sports facilities were closed (most of 2020). The reduction in car traffic during this period also encouraged both experienced and novice cyclists to cycle, or to return to the practice. Such individuals included Bianca (female, 23 years old, Lyon), a student who had learned to cycle as a child but had never cycled on a regular basis. She was required to go into her workplace during the lockdowns and took advantage of the reduced car traffic to take up and gain confidence in a practice that was new to her. This modal choice was motivated in equal measure by her desire to avoid using public transport and her desire to use her commute to do physical activity as, at the time, French people were only allowed to stay outside for one hour. Finally, and to a lesser extent, environmental arguments were also put forward, particularly by those interviewees who had stopped commuting by car.

Taken as a whole, the new infrastructure and financial incentives have also had a cumulative impact on encouraging and subsequently sustaining cycling. The example of Carina (female, 27 years old, Saint-Étienne), a cyclist with limited experience, illustrates the combined value of a range of incentives. Carina explained that the Covid cycle lane she used for three weeks on her daily commute increased her sense of legitimacy as a cyclist ("I liked saying to myself, 'this is my space'"), and that using the €50 bike repair voucher has made her feel safer. She has also started cycling for sport on hilly routes with friends, prompting her to investigate the support available for buying an electric bike, with the intention of continuing to enjoy riding "in the mountains" on a longer-term basis.

For those who practiced utility cycling before the pandemic, the habit was reinforced, which may have created ripple effects among their friends and family. For Josselin (male, 36 years old, Rennes), the pandemic and the increased visibility of cycling due to the pop-up infrastructure acted as a catalyst: he increased his own journeys by bike (to the inner commuter belt) and extended the practice to his family (particularly his children). Similarly, Laurence (female, 46 years old, Lyon) used to cycle in the city only to go shopping, but during the pandemic she used the voucher to help buy an electric bike and now also cycles to her workplace, located 9 km away in the inner suburbs. The reduction in urban traffic also encouraged her to go on family outings with her teenage children by bike, which has encouraged her son to cycle to school on a daily basis. The disruption to habits and lifestyles brought about by the pandemic, the financial incentives introduced, and the infrastructure improvements have thus had a cumulative impact on the appeal of cycling. We found that the existence of cycling infrastructure even influenced the attractiveness of workplace locations—one of the reasons that Pauline (female, Montpellier) chose her new job was because of the Covid cycle lanes: "I saw that there were temporary lanes […] almost all the way to my workplace. That was a big factor in applying for a job there."

Although certain interviewees did not report any significant increase in their everyday cycling, with some even cycling less due to reduced everyday travel overall, they did report diversification in the uses of cycling. When Jean-Pierre (male, 51 years old, Grenoble) was forced to work from home for several months, he turned his

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commute into a recreational cycle ride by designing his route around the Covid cycle lanes: "When I was going into work, I would travel between 20 and 25 km a day […]. Suddenly I found myself working from home […]. I thought, 'I miss it, what am I going to do?' So I said,' OK, between 6 and 7 [in the morning], I'm going to cycle, just for myself, to keep fit […] I built my route around the Covid cycle lanes."

Although the pop-up infrastructure was widely discussed in the French press (see Chap. 4), we found that most of the interviewees were unfamiliar with the term "Covid cycle lane," and those who did know the term did not necessarily associate it with the actual facilities themselves. Their yellow color and the materials used for separation—white and red weighted traffic barriers and bollards—are more associated with road works than urban planning. This confusion was particularly prevalent in Lyon, where, at the same time, and for the first time in the city's history, the highway department began to create cycle diversions using the same yellow color, making it even more difficult to identify the temporary infrastructure. The best-informed interviewees were those who knew about the infrastructure through membership of a cycling club or a cycle promotion organization. Whether they used them regularly or not, the other cyclists did not identify them as part of a specific scheme introduced in response to a desire to increase cycling during the pandemic.

Individuals thus found out about the new infrastructure through their everyday journeys, as they observed changes on their routes, or in journeys made during their leisure time or by car. They became aware of the major developments that had changed the "look" of the roads, such as Rennes's *vélorue* (cycle street) on the Quai Lamartine, or the Place de Bretagne, and the closure of two lanes on the Quai de la Jonchère in Lyon (Fig. 10.5).

10.3   The Cyclists' Relationships to Covid Cycle Lanes

What role have the Covid cycle lanes played in the changes observed? In this section we look first at awareness of the Covid cycle lanes, and second at how cyclists make use of them in an everyday context.

10.3.1   *The Response to and Uses of the Pop-Up Cycling Infrastructure*

The types of infrastructure created across the field sites consisted of cycle lanes and tracks, shared bus and cycle lanes, cycle contraflows, ASLs, and cycling facilities at roundabouts. By focusing on the types of infrastructure that were used by the interviewees in ways that raised questions for us, we aim to understand how and why everyday cycling has been affected by the scheme.

Fig. 10.5 Lyon, Quai de la Jonchère, April 2021. *Credit* Nathalie Ortar

10.3.1.1   One-Way or Two-Way Cycle Tracks

How users respond to cycle tracks is highly dependent on their technical characteristics, in particular their width. The most popular facilities are the one-way or two-way segregated cycle tracks created along major roads, either by removing one of the car lanes, for example on the Montée de la Boucle in Lyon and the Route de Ganges in Montpellier (Fig. 10.6), or by reducing the width of the car lanes, as on Lyon's Quai Sédaillan.

The presence of bollards on the road, designed to prevent vehicles from parking or encroaching on the lane, is perceived as a way of increasing safety. While this form of infrastructure is popular, the compromises made to ensure the flow of motor traffic and the opposition from motorists have thus limited its use. Clémentine (female, 26 years old, Lyon), discovered the two-way cycle lane on the Montée de la Boucle by chance, and immediately started using it for her morning commute to work. The junction where cyclists are required to give way halfway up the hill is not a problem for her on her way in because she can see the cars coming uphill at high speed, but on the journey home she feels that the speed differential between her and the motorists is too great to cross the road safely (Fig. 10.7). She has therefore continued to use her old route, which is not dedicated to cyclists but has slower moving motor traffic.

The perceived usefulness of the cycle lanes also varies depending on their relative position in the network as a whole, as Corentin (male, Montpellier) explained in relation to the Saint-Charles Covid cycle lane: "this one is actually really good because afterward you can continue directly to the left of the Philippidès Stadium,

Fig. 10.6 Covid cycle lane on the Route de Ganges, Montpellier, May 2021. *Credit* Andoni Hentgen-Izaguirre

Fig. 10.7 Montée de la Boucle, Lyon, April 2021. *Credit* Nathalie Ortar

Fig. 10.8 Louis and his father, Avenue de Grande-Bretagne, Lyon, May 2021. *Credit* Nathalie Ortar

it creates continuity." Finally, usage also depends on who is riding with the cyclist. On their outing along the Avenue de Grande-Bretagne, Louis (male, 6 years old, Lyon) and his father Rémi (male, 45 years old, Lyon) used the shared-use track on the sidewalk (Fig. 10.8). In the follow-up interview, however, Rémi explained that he uses the dedicated cycle lane on the carriageway (on the right of the Fig. 10.8) when he is alone and in a hurry.

However, in places where lanes are separated solely by a solid line combined here and there with plastic wands, interviewees did not feel sufficiently safe, as cars could drive into the lane, notably in order to park (Fig. 10.9).

Problems sharing the carriageway with motorists arise even with cycle lanes the width of a motor lane if cars may be required to cross the path of a cyclist (Fig. 10.10). Paméla (female, 36 years old, Lyon) considers herself to be an experienced cyclist, but only agreed to use the central lane extending the shared bus and cycle lane on the Rue de l'Épargne for the purposes of the study, as she usually prefers to make a slight detour to avoid sharing the space with cars crossing her path.

10.3.1.2 Shared Bus and Cycles Lanes

Across all of the cities, cyclists' responses to pop-up shared bus and cycle lanes are highly dependent on the context, notably the frequency of buses and the cyclist's

Fig. 10.9 Covid cycle lane on the Boulevard de la Liberté, Rennes, 2021. *Credit* Léa Barbé

Fig. 10.10 Paméla, central lane on the Rue de l'Épargne, Lyon, May 2021. *Credit* Nathalie Ortar

confidence in their abilities, and the prior socialization of both bus drivers and cyclists to this arrangement. Indeed if in few cities cyclists had been allowed to circulate in the bus lanes, it wasn't the case in Lyon, Montpellier, and Rennes. The positives of these lanes for cyclists are the time saved and greater safety, compared to problems they have had in the past sharing the road with cars or the sidewalk with pedestrians. These lanes thus allow cyclists to take new routes that they often consider wide, comfortable, and spatially identified and identifiable. The width of the lane,

associated with comfort, came up in the interviews on a regular basis. Clémentine, in Lyon, really liked using the shared bus and cycle lane on her journey because it meant she could avoid the shared-use path on the sidewalk. This bus and cycle lane, which is very popular with cyclists, makes them feel safer on the road. When created on roads with two lanes in each direction, pop-up shared bus and cycle lanes help to eliminate no-go areas, i.e., the sections that interviewees sought to avoid at all costs. Changes have therefore been made to routes to include these lanes, in order to improve safety and travel time. Thus, by giving cyclists a relative advantage over motorists—who are slowed down by the reduction in the number of lanes—shared lanes have contributed to the increase in the modal share of cycling.

Nonetheless, for some interviewees sharing the carriageway with buses, taxis (permitted in Montpellier under certain circumstances), two-wheeled motor vehicles (despite being prohibited), and in places cars, is a problem as it is felt to be unsafe. Less experienced cyclists find having a bus a few meters behind them stressful, and this directly affects their behavior on the road. Erwan (23 years old, Rennes), a new cyclist, did not see the point of shared bus and cycle lanes: "I'm not very comfortable on them, but as they [the buses] stop on them, that gives me time to get a bit further ahead. But overtaking them is impossible because they take up the whole space, so you have to stay behind them or overtake on the road and put yourself in danger. They might as well put us in the middle of the HGVs while they're at it!".

The prospect of being overtaken by a bus also creates anxiety, since cyclists do not necessarily see them coming. Constrained by the cars on the left, buses have to accelerate to overtake quickly, as illustrated by Christian's journey in Montpellier (Fig. 10.11), or squeeze cyclists out in order to fit alongside the cars. They then have to brake when approaching a stop, encouraging the cyclist to overtake in turn. For all of these reasons, some individuals took detours to avoid using these lanes, including Bianca (23 years old, Lyon), a new cyclist.

The failure of some motorists and motorcyclists to comply with the road traffic regulations, for example by using shared lanes to park or to avoid waiting at traffic lights by skipping the queue in the car lane, further adds to the feeling of being unsafe. Pop-up tracks on the sidewalk were more popular among our interviewees. But both sharing the road with people traveling by other modes—whether motor traffic or pedestrians—and the methods used to separate the allocated spaces were raised as problems.

10.3.1.3 Cycle Contraflows

Cycle contraflows are also accepted to varying degrees depending on the context, based on how safe they make cyclists feel. In France, contraflow cycling has been permitted in 30 km/h zones since 2008, and city authorities often used these schemes as a development solution, particularly in the narrower, and often older, parts of cities. These early contraflow lanes were very narrow, and it was thus often difficult to pass alongside a car, but the system legalized what was already happening in practice. The cycle contraflows implemented during the pandemic were on wider roads carrying

Fig. 10.11 Christian, overtaken by a bus on the shared lane on Avenue de la Pompignane, Montpellier, May 2021. *Credit* Adrien Poisson

more traffic, but in the view of the interviewees provided sufficient safety in terms of visibility. Corinne (female, 56 years old, Lyon) prefers to cycle against the flow of traffic because she knows she will both be seen and be able to see oncoming motorists, especially those wanting to park or get out of their vehicle (Fig. 10.12).

10.3.1.4 Roundabouts

Roundabouts have been identified as black spots in many urban areas before and since the pandemic. To protect cyclists, lines of cones were set out to create cycle lanes completely separate from the carriageway, inspired by the principles of Dutch-style infrastructure. Cyclists should have a right of way at junctions but, as illustrated by the photographs below, this is seldom respected by drivers of motor vehicles (Fig. 10.13).

The position of the cycle lane on the outside of the roundabout, regardless of its size, creates several problems, as motorists entering the roundabout do not necessarily have cyclists in their field of vision, and cyclists do not have a good view of the vehicles behind them. On minor roundabouts, CEREMA[5] recommends central markings to encourage cyclists to ride in the middle of the traffic lane, which makes them much more visible. Some cyclists do so, such as Matthieu (male, Montpellier),

[5] Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement [Centre for Studies and Expertise on Risks, the Environment, Mobility and Urban Planning] has for mission to be expert to local authorities and suggest tailored-made solutions.

Fig. 10.12 Corinne, cycle contraflow, Villeurbanne, Lyon, May 2021. *Credit* Nathalie Ortar

Fig. 10.13 Crossing the Général de Gaulle roundabout, Rillieux-la-Pape (Grand Lyon), June 2021. *Credit* Nathalie Ortar

who does not use the cycle track so as to avoid the risks of crossing (Fig. 10.14), while others, such as Kim (female, Montpellier), prefer to cycle on the sidewalk (Fig. 10.15).

Fig. 10.14 Leaving the cycling infrastructure on the Boutonnet roundabout, Montpellier, May 2021. *Credit* Andoni Hentgen-Izaguirre

Fig. 10.15 On the sidewalk around the Route de Mende roundabout, Montpellier, May 2021. *Credit* Adrien Poisson

10.3.2 Tactical Urbanism, Materiality, and Changing Practices

Looking beyond the practice of cycling itself, the interviewees felt that the Covid cycle lanes have contributed to improving the image and raising the profile of cyclists in public space. Their rapid creation has helped give visibility to, and legitimize, a practice that was still marginal despite a steady increase in its popularity in the centers of cities that had started to develop their cycling network. In this respect, the existence of pop-up infrastructure in any form is welcomed by users.

Our interviewees reported that these facilities give them a certain level of safety, as Erwan (male, 23 years old, Rennes) observed: "Indirectly, it was another thing that prompted me to think, I'm going to get a bike. I saw them when I was walking. I could see the lanes were the width of a road and I thought, 'That's not bad!'" In Saint-Étienne, one Covid cycle lane was installed on a road where there was no cycling infrastructure, opening up a possible new route for cyclists who were afraid to share the road with cars and thus giving them an opportunity to access new activities located in parts of the city previously considered inaccessible by bike. The removal of this lane three weeks later had gone down very badly with some of the interviewees. Finally, this type of Covid cycle lane enabled the children of interviewees to gain independence, albeit sometimes only temporarily, as shown by Sofiane (male, 41 years old, Grenoble): "Hugo [9 years old] used to go to the hairdressers by himself, but now the lane has been removed he can't do that anymore."

The quality of the journey is related to the degree to which the infrastructure is easily understandable and specifically designed. Clarity must work both ways: for cyclists, who need to be able to find their way without hesitation, even in places with which they are less familiar, and for motorists and pedestrians, who also need to be able to easily identify areas that are shared with cyclists, and dedicated cycling infrastructure. This is one of the reasons for the popularity of transport mode-specific lanes. The lack of clarity, notably due to the complexity of some of the pop-up schemes, especially at junctions, creates problems and leads to more exacting demands from road users about cycling facilities (Fig. 10.16).

The pursuit of clarity may result in cyclists making changes to their route to ensure their safety and/or to make use of cycling facilities. The demand for physically separated infrastructure is also supported by the argument of exposure to the pollution generated by motor traffic, which is perceived to be both harmful and unpleasant (smell and sound)—a claim that appears to be more related to conditions of use (speed and density of traffic) than to cyclists' level of experience and confidence. Emily (female, 35 years old, Grenoble), who cycles daily over long distances and on a hilly route, expressed particular sensitivity to air quality: "I don't understand why they always put cycle tracks along roads. Wouldn't it be nice if we could use cycle tracks without breathing in exhaust fumes?" Routes along parks or waterways are therefore preferred as long as cyclists feel safe on them, even if they make their journey longer, a criterion found in the literature and which are also included in guides and recommendations (Porter et al. 2020).

Fig. 10.16 Covid cycle lane on the Boulevard de la Tour d'Auvergne, Rennes, 2021. *Credit* Léa Barbé

Continuous routes are also valued (Puchaczewski et al. 2019). A Covid cycle lane is thus always better received, whatever its form, when it improves the continuity of a route. Franck (male, Montpellier) said with some irritation: "very often […] they mark out a cycle route for 200–300 m and as soon as it gets difficult, you have to sort yourself out […] in places where I'm really in danger, there's no infrastructure." Continuity, like safety at junctions, is considered essential regardless of the quality of the network, and breaks in the network are particularly problematic for individuals who lack experience or confidence, and for those with children. Thus, the interrupted nature of the new routes increases the sense of danger. For Pauline (female, Montpellier) "it's unacceptable to have to walk your bike along the sidewalk to get from one section to another. I don't see why I have to do that when cars don't have to."

In cities like Rennes, changes have been made to the infrastructure on a regular basis, making the schemes difficult to follow and thus impeding stable usage. This points to the use that can be made of tactical urbanism and the way in which facilities can be suggested and validated; in addition to the quality of the infrastructure, it is important to factor in the way it is provided and the time required for the necessary adjustment and for people to start using it. Josselin (male, 36 years old, Rennes) was keen to stress this point: "There, you just don't know… It's supposed to be a cycle track on the left and right [Covid cycle lane on the sidewalk] but you don't know how to get on it. So it's clearly not practical because you never know where it is and you're on the sidewalk with pedestrians…" (Fig. 10.17).

Fig. 10.17 Josselin, Boulevard de la Tour d'Auvergne, Rennes, 2021. *Credit* Léa Barbé

This brings us to the issue of consultation and to the way in which the needs of cyclists have been understood by politicians. This aspect is studied in detail in Chap. 3, but here we will set out the types of infrastructure that users consider to be a waste of time. Mostly these are bits of cycle tracks with no continuity between them, as discussed above, but they also include facilities created in response to political factors, and infrastructure that is too narrow (to accommodate different speeds, cargo bikes, tricycles, etc.), poorly maintained (broken glass, rubbish, cones down the middle, etc.), or redundant. In Saint-Étienne in particular, some of the interviewees saw the Covid cycle lanes as a publicity stunt ("it's all for show," "public-relations exercise," "an election stunt," etc.) that was sometimes counterproductive: "It was great for us, but it didn't necessarily go down well with motorists and I felt like it was a bit of a publicity stunt […] there was already a cycle track and a pedestrian path [on Cours Fauriel]. So I didn't understand why they put a lane there" (Luc, male, Saint-Étienne).

More broadly, the problems raised by the interviewees across the various field sites reflect increased expectations based on the bikeability of the streetscape and the desire to extend cycling to groups perceived to be more vulnerable, such as children or older adults. By increasing the density of users on the roads, the growth in cycling linked to the pandemic and specific infrastructure has had a dramatic impact on notions of comfort and safety, and in particular on the feeling of vulnerability. As understanding the vulnerability of cyclists in all its facets is key to promoting the sustainability of cycling in the long term, it is necessary to reflect in particular on the visibility of cyclists in traffic.

Many of the comments made by the cyclists concerned their need to be visible, and the place assigned to them on the road by the rules governing interactions between road users. When interacting with users of motor vehicles (cars, buses), cyclists continue to use the tactics—sometimes individual, sometimes collective—they had employed prior to the pandemic in order to enforce rights of way and increase their visibility or that of other road users they consider to be vulnerable (such as pedestrians and children). They have adapted these tactics to the new forms of infrastructure,

in particular the "protected" roundabouts (Lyon) or major intersections (Rennes). For example, they occupy the space and/or slow down when approaching a junction to force cars to give way, like one cyclist (male, 41 years old, Rennes) who adds: "so half of the time, I give way to pedestrians, because when I give way to them, often the cars don't and it becomes almost dangerous for them." The effort made by individuals to make themselves safe and visible is therefore a continual process. It involves both the need to be vigilant in order to avoid, for example, being "doored" when riding alongside parking areas, and maintaining a safe distance when overtaking buses on shared lanes, or in contraflow schemes which, although they enable cyclists to avoid certain detours, put them head-on against oncoming motor vehicles. This precarious coexistence is not without its dangers and can lead to conflicting uses or even tensions between users that can increase the sense of vulnerability: one male interviewee (41 years old, Rennes) claimed that "[t]here have been several attempts to run me over…".

This need to make themselves visible tends to undermine the position of the interviewees in traffic and thus forces them to question their legitimacy as users entitled to appropriate, safe infrastructure. This legitimacy is undermined through both their interactions with other road users, particularly in terms of the hierarchy of rights of way in traffic, and through inequalities in terms of the maintenance of cycling facilities compared to those for motor users, as one cyclist (female, 23 years old, Rennes) explained: "in general, the car lanes are perfectly nice but the cycle tracks aren't maintained, especially when they're on the sidewalk, they're usually stoned." These concerns are not specific to the Covid cycle lanes, but the lack of maintenance across the network—our interviews show that cyclists tend to use various parts of the network—may have discouraged some individuals, particularly novice cyclists.

Finally, it should be noted that theft—a problem before, during, and since the pandemic—was frequently mentioned as a limiting factor for cycling across all of the study sites. Experiences of bicycle theft were numerous and sometimes discouraging. Although most of the interviewees were able to store their bicycle at home—a decisive factor in favoring utility cycling in the view of all the interviewees—as well as to a lesser extent at their workplace, this was more of a problem when out in the city. Buying a new bicycle is expensive, and when cyclists decide not to invest in a better-quality bike due to fear of it being stolen, security and safety issues collide. This emphasizes the need to improve cycle parking provision alongside safe cycling infrastructure.

10.4   Conclusion

Covid cycles lanes have open up paths of action and produce a different relationship to space and mobility. Although most of the cyclists interviewed haven't realized that the new infrastructure belonged to tactical urbanism, their very existence has opened new opportunities and, even when they were not used, emulated changes in

mobility patterns. The results confirm that providing new physical spaces, shifting the domination of automobility induces changes.

Our findings establish a number of prerequisites for consolidating the quality of cycling facilities. The pop-up infrastructure has contributed to normalizing the place of cyclists in traffic and in the public space more generally, but in some cases it remains difficult to use safely, and requires users to employ tactics based on the situations of vulnerability created or the perceived vulnerability of certain users. The importance of signage came up numerous times. Clear signage provides information for all road users (both cyclists and non-cyclists), which is why certain cyclists feel that it should be updated to reflect changes in use, to show black spots and types of interaction between road users. Infrastructure that is clear to follow, dedicated to cyclists, and properly maintained increases the visibility of cyclists, and thus their legitimacy and safety. This study also confirms the importance of moving from a section-based approach to a network-based approach in order to understand the infrastructure as a whole. As far as possible, modes of transport should also be physically separated, to avoid conflicts of use between road users and improve cyclist safety, and as an essential prerequisite for supporting cycling.

The analysis of the use of Covid cycle lanes by both novice and more experienced cyclists also reveals the ripple effects that this temporary infrastructure may have had in encouraging new uses, and also in inciting new users, including children, to adopt cycling on a daily or more irregular basis. The diversity of the field sites highlights the importance of the presence of other cyclists in creating ripple effects due to the diffusion of a cycling culture, a point already raised in the literature but corroborated here (Vandenbulcke et al. 2011), thus confirming the political power of infrastructure. The expectations and dissatisfaction generated by the pop-up facilities provide us with information about the importance of both the quality and continuity of the infrastructure, as well as interest in cycling and its potential for growth, even in areas that are not only dominated by cars but may be considered unsuited to bikes because of their topography. The clear popularity of separated infrastructure points to the model of a slower city, yet to garner support, that would help make city cycling accessible to people with disabilities or with little socialization to cycling. This would contribute to expanding the cycling public and strengthen mobility socialization through utility cycling among children.

Exploring the response to the infrastructure also reveals different uses based on the reason for the journey, whether or not cyclists feel comfortable on the car lane (Adam et al. 2022), and with whom they are cycling. This leads us to postulate that for a city to increase its bikeability, it needs to contain different types of infrastructure in order to encourage different levels and types of cycling (Freudendal-Pedersen 2020; Cox 2020).

The different paces of change and the mutual adjustments between cycling practices and the pop-up infrastructure also need to be highlighted as they reveal both the value and the limitations of the tactical dimension in the implementation of the Covid cycle lanes. The rapid changes in cyclist behavior produced by the Covid cycle lanes may be countered by the sluggish evolution of more traditional infrastructure. Conversely, the pop-up facilities, implemented rapidly and on an experimental basis

before eventually being made permanent, have highlighted the resistance to change in the behavior of other road users, whether pedestrians or motorists, who have been slower to adapt.

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