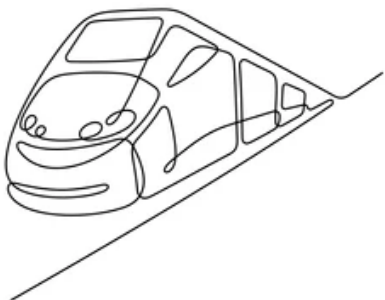

3rd Smart And Sustainable Cities Conference
 Session 5: Urban mobility, new technologies and urban development
 May 20, 2021

An analysis of intermodal use of e-scooters with train in the Provence-Alpes-Côte d'Azur region, in France:

Towards extended railway station areas?

Dylan MOINSE, Matthieu GOUDEAU and Alain L'HOSTIS



Improving access to public transport:

- “Mitigating the traffic (and its effect such as CO2 emissions) can then be obtained by **reducing the urbanized area size** or, more realistically, by improving either **the public transport density or its access**” (Verbavatz and Barthelemy, 2019 : 10).

Through emerging modes:

- “[...] **new modes** – or modes which are hardly used today – could significantly grow in coming years, and contribute to **intermodal chains**. The findings indicate that the majority of all experts expect an increase intermodal trips which include a new means of transport for most of the cities” (Goletz *et al.* 2020 : 116).
- “With regard to the emergence of new mobility forms (such as sharing concepts or **micromobility**), **intermodality** in cities is expected to become even more relevant in the future” (Oostendorp and Gebhardt, 2018 : 77).

Such as electric scooters:

- “**Privately-owned** e-scooters are relatively light and foldable and can be carried on transit, while **rental** e-scooters can be picked and left at transit stations” (Tuncer *et al.*, 2020 : 1)

Contents

1. Literature review
 2. Survey methodology
 3. Results
- Conclusion

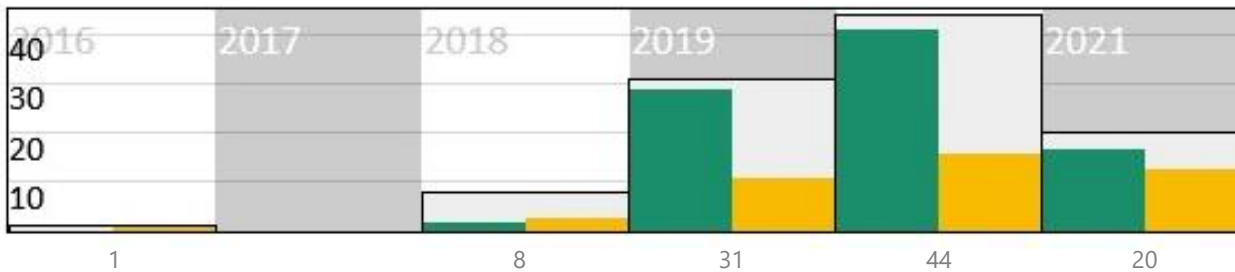
References:

- D: Transport and Environment, 92, 102734. <https://doi.org/10/gh4pjs>
- Goletz, Haustein, Wolking and L'Hostis. (2020). *Intermodality in European metropolises: The current state of the art, and the results of an expert survey covering Berlin, Copenhagen, Hamburg and Paris*. Transport Policy, 94, 109-122 p. <https://doi.org/10/gh5894>
- Oostendorp and Gebhardt. (2018). *Combining means of transport as a users' strategy to optimize traveling in an urban context: Empirical results on intermodal travel behavior from a survey in Berlin*. Journal of Transport Geography, 71, 72-83 p. <https://doi.org/10/gfhf3j>
- Tuncer, Laurier, Brown and Licoppe. (2020). *Notes on the practices and appearances of e-scooter users in public space*. Journal of Transport Geography, 85, 102702. <https://doi.org/10/ggxgv4>
- Verbavatz and Barthelemy. (2019). *Critical factors for mitigating car traffic in cities*. PLOS ONE, 14(7), e0219559. <https://doi.org/10/ggwqx5>

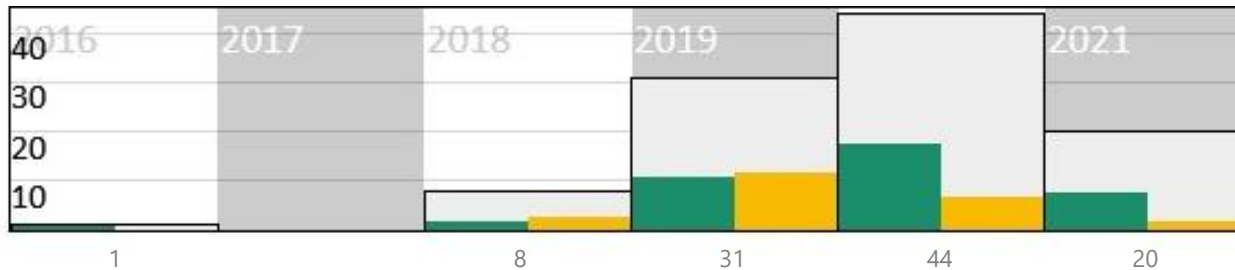
1. Literature review

Timelines

Publications per year: shared and owned e-scooters N=104

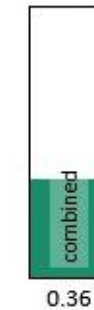


Publications per year: European and American studies N=104

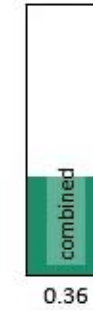


Studies on intermodal trips

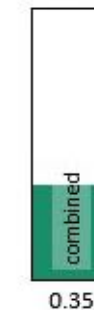
Shared E.-S.
Publications: 89



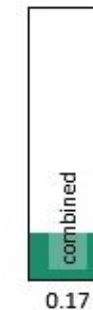
Owned E.-S.
Publications: 44



Europe
Publications: 40



North America
Publications: 24



Authors : Goudeau, L'Hostis and Moïse, 2021
Made with SurVis - Visual Literature Database

1. Literature review

Socio-demographic characteristics

Gender:

3/4 – 2/3

Share of men among **personal** and **shared** e-scooter users

Females/Males share :

- **42% / 58%** for **renters** in the U.S. (Clewlow, 2018 : 14)
- **40% / 60%** for **owners** in France (Richer, 2021)
- **38% / 62%** for **renters** in Austin (U.S.) (Zuniga-Garcia *et al.*, 2020 : 16)
- **33% / 67%** for **renters** in Paris, Lyon and Marseille (France) (6t-Bureau de recherche, 2019a : 50)
- **32% / 68%** for **renters** in Paris (France) (Apur, 2020 : 46)
- **32% / 68%** for **renters** in Paris (France) (de Bortoli and Christoforou, 2020 : appendices)
- **32% / 68%** for **renters** in Calgary (Canada) (Sedor and Carswell, 2019)
- **34-19% / 66-81%** for **renters** in the U.S. (NACTO, 2020 : 16)
- **25% / 75%** for **renters** in Paris (France) (6t-Bureau de recherche, 2019b : 13)
- **23-26% / 74-77%** for **renters** in Vienna (Austria) (Laa and Leth, 2020 : 3)
- **23% / 77%** for **renters** in Germany (Degele *et al.*, 2018 : 3)
- **13% / 87%** for **renters** in Riyadh (Saudi Arabia) (Almannaa *et al.*, 2021 : 9)
- **3-15% / 85-97%** for **owners** in Vienna (Austria) (Laa and Leth, 2020 : 3)

References

- **6t-Bureau de recherche.** (2019a). *Usages et usagers des trottinettes électriques en free-floating en France*, 158 p.
- **6t-Bureau de recherche.** (2019b). *Comprendre les usages d'un service de trottinettes électriques en free-floating. Enquête auprès des utilisateurs du service Dott à Paris*, 70 p.
- **6t-Bureau de recherche.** (2020). *Le développement du vélo et de la trottinette dans les grandes villes françaises: Une tendance confrontée au stationnement dans l'espace public*. Rapport final, 56 p.
- **Almannaa et al.** (2021). *Perception Analysis of E-Scooter Riders and Non-Riders in Riyadh, Saudi Arabia: Survey Outputs*. Sustainability, 13(2), 863. <https://doi.org/10/gjgqjc>
- **Apur.** (2020). *Les mobilités émergentes, trottinettes, scooters et vélos en partage. Profils, pratiques, attentes à partir d'une enquête réalisée auprès des utilisateurs*, 100 p.
- **BCDOT.** (2020). *Baltimore City. Dockless Vehicle Program Annual Evaluation Report: Permit Year One Scooting from Pilot to Permanence*. Baltimore City Department of Transportation, 47 p.
- **Clewlow.** (2018). *The micro-mobility revolution: The introduction and adoption of electric scooters in the United States*. Populus, 17 p.
- **de Bortoli and Christoforou.** (2020). *Consequential LCA for territorial and multimodal transportation policies: Method and application to the free-floating e-scooter disruption in Paris*. Journal of Cleaner Production, 273, <https://doi.org/10/gg5qjn>

Age:

25-35

Dominant age category among **personal** and **shared** e-scooter users

Median/Mean :

- **21 / 26** for **renters** in Lyon (France) (Pestour, 2019 : 37)
- **25 / 28** for **renters** in Paris (France) (de Bortoli and Christoforou, 2020 : appendices)
- **26/ 29** for **renters** in Paris (France) (6t-Bureau de recherche, 2019b : 14)
- **30 /** for **owners** and **renters** in Vienna (Austria) (Laa and Leth, 2020 : 6)
- **30 /** for **renters** in the U.S. (NACTO, 2020 : 16)
- **30 / 34** for **renters** in Paris (France) (Apur, 2020 : 46)
- **33 / 34** for **renters** in Germany (Degele *et al.*, 2018 : 4)
- **34 / 37** for **renters** in Paris, Lyon and Marseille (France) (6t-Bureau de recherche, 2019a : 51)

Frequency:

At least once a week (shared)

Between 1/3 and 2/3 use a **shared** e-scooter at least once a week

Source	Location	Daily	>2/week	1/week	1/month	<1/month
6t-Bureau de recherche, 2019a : 63	Paris, Lyon and Marseille (France)	6%	13%	11%	23%	20%
6t-Bureau de recherche, 2019b : 25	Paris (France)	6%	20%		33%	47%
6t-Bureau de recherche, 2020 : 20	France	5%	10%	13%	13%	48%
Apur, 2020 : 59	Paris (France)	19%	27%	31%	15%	10%
BCDOT, 2020 : 27	Baltimore (U.S.)	12%	22%	26%	18%	9%
Degele <i>et al.</i> , 2018 : 6	Germany		4%		82%	14%
Fearnley <i>et al.</i> , 2020 : 23	Oslo (Norway)	15%	35%	20%		22%
Laa and Leth, 2020 : 3	Vienna (Austria)	0%	5%	27%		45%
	Vienna (Austria)	24%	46%	24%		2%
Pestour, 2019 : 39	Lyon (France)	1%	9%	33%		28%

- **Degele et al.** (2018). *Identifying E-Scooter Sharing Customer Segments Using Clustering*. 1-8. <https://doi.org/10/ggx674>
- **EY research.** (2020). *Micromobility: Moving cities into a sustainable future*, 36 p.
- **Fearnley, Berge and Johnsson.** (2020). *Delte elsparkesykler i Oslo. En tidlig kartlegging* (N° 1748/2020), 99 p.
- **Gioria** (2016). *Etude d'évaluation sur les services vélos – Enquête sur le stationnement sécurisé intermodal*. ADEME, 46 p.
- **Laa and Leth.** (2020). *Survey of E-scooter users in Vienna: Who they are and how they ride*. Journal of Transport Geography, 89, 102874. <https://doi.org/10/gghqzz>
- **NACTO.** (2019). *Shared Micromobility in the U.S.: 2018*, 15 p.
- **Pestour.** (2019). *Approche socio-économique des enjeux relatifs aux trottinettes électriques en libre-service en France*, 92 p. [Mémoire de fin d'études, LAET (Lyon, France)].
- **Richer.** (2021). *[Dossier Mobilités] #11 - Micromobilités et intermodalités: L'enjeu des engins de déplacement personnels*. construction21.org.
- **Sedor and Carswell.** (2019). *Shared e-Bike and e-Scooter Mid-Pilot Report* (N° TT2019-1374; p. 24). SPC on Transportation and Transit.
- **Zirn, Sagert and Rüter.** (2018). *Foldable Electrified Ultralight Vehicles on Public Walkways for Sustainable Traffic Chains*. International Journal of Civil Infrastructure, 1(1), 1-8 p.
- **Zuniga-Garcia et al.** (2020). *Evaluation of e-scooters as transit last-mile solution*. 25.

1. Literature review

Socio-demographic characteristics

Purpose of trips with **shared** and **personal** e-scooters:

Commuting and recreation

Source	Location		Get from/to work	Recreation / Social	Shopping / Restaurant	Errands	Get from / to public transport
6t-Bureau de recherche, 2019a : 68	Paris, Lyon and Marseille (France)		16%	20%	3%	17%	10%
6t-Bureau de recherche, 2019b : 34	Paris (France)		18%	14%			
Almannaa et al., 2021 : 9	Riyadh (Saudi Arabia)		21%	93%	14%		9%
Apur, 2020 : 58	Paris (France)		48%	46%	4%		
BCDOT, 2020 : 28	Baltimore (U.S.)		52%	22%		7%	5%
City of Chicago, 2020 : 84	Chicago (U.S.)		44%	91%	42%	28%	34%
Fearnley et al., 2020 : 24	Oslo (Norway)		39%	19%		11%	15%
Pestour, 2019 : 51	Lyon (France)		15%	78%	7%		
PBOT, 2019 : 20	Portland (U.S.)					29%	
Richer, 2021	France		27%				
Sedor and Carswell, 2019 : 10	Calgary (Canada)		18%	15%	16%	24%	5%
Wachunas, 2019	Oakland (U.S.)		35%				
Zuniga-Garcia et al., 2020 : 16	Austin (U.S.)		61%	23%			

Effect of COVID-19: resilient / rising

Use of e-scooters is resilient or even is rising :

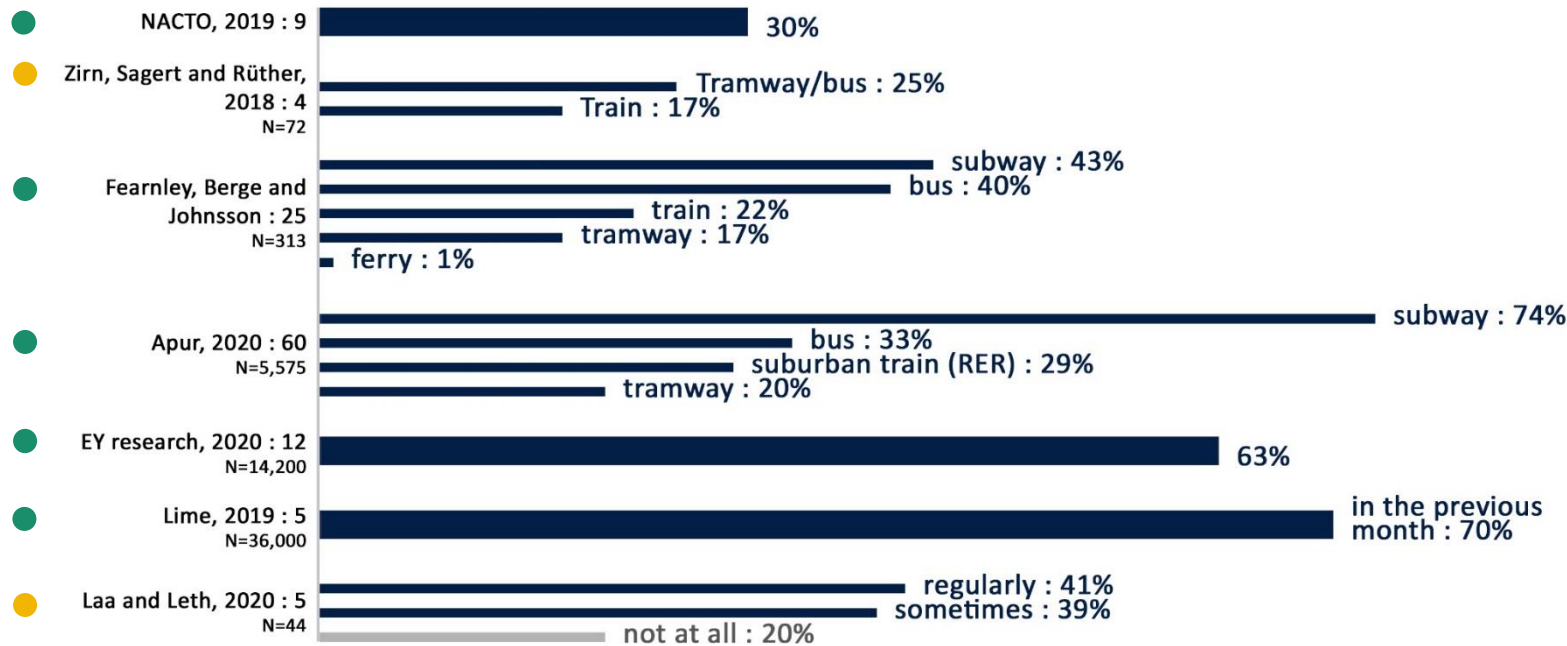
- In the U.S., China and Europe, for **owned** e-scooters (Bert et al., 2020)
- After the first peak in France, Germany and Italy, for **shared** e-scooters (INVERS and Fluctuo, 2020)
- Attract new **owned** and **shared** e-scooter users in France:
 - 640,000 e-scooters were **purchased** during 2020, 34% more than last year (FP2M and SML, 2021).
 - 13 million trips with free-floating e-scooter were made in France in 2020, i.e. 16% of total **shared** mobility (Fluctuo, 2021)
 - Preliminary data [in the Ile-de-France region] suggests that light transportation modes have considerably increased recently: in September and October 2020 [...] (OMNIL, 2021 : 35)
- This resonates with the public transport strike in the Ile-de-France region, which has brought a more female clientele into the **shared** e-scooter market (Apur, 2020 : 68)

References

- **Hagenmaier et al.** (2020, juin 16). *How COVID-19 Will Shape Urban Mobility*. BCG.
- **City of Chicago.** (2020). *E-scooter. Pilot Evaluation*. 97 p.
- **Fluctuo.** (2021). *Baromètre de la mobilité partagée. Bilan 2020*. 11 p.
- **FP2M and SML.** (2021). *COMMUNIQUE DE PRESSE - Baromètre marché FP2M/SML 2020*. Fédération des Professionnels de la Micro-Mobilité (FP2M).
- **INVERS & Fluctuo.** (2020). 18 p.
- **OMNIL.** (2021). *La mobilité au temps de la Covid 19. Enquête Mobilité Covid. Vague 1: Septembre-Octobre 2020*. Île-de-France Mobilités. 48 p.
- **PBOT.** (2018). *2018 E-Scooter Findings Report* (p. 35). Portland Bureau of Transportation. [htWhite Paper European shared micromobility in the face of a pandemic. A story of emerging industry resiliencetps://www.portlandoregon.gov/transportation/78431](https://www.portlandoregon.gov/transportation/78431)
- **Wachunas.** (2019). *Trip Data In Oakland Give Important New Insights Into Scooter Demand In San Francisco*.

1. Literature review

Share of e-scooter users who tend to have intermodal practices



Authors : Goudeau, L'Hostis and Moïnse, 2021

References:

- **Apur.** (2020). *Les mobilités émergentes, trottinettes, scooters et vélos en partage. Profils, pratiques, attentes à partir d'une enquête réalisée auprès des utilisateurs*, 100 p.
- **EY research.** (2020). *Micromobility: Moving cities into a sustainable future*, 36 p.
- **Fearnley, Berge, & Johnsson.** (2020). *Delte elsparkeresykler i Oslo. En tidlig kartlegging* (N° 1748/2020), 99 p.
- **Gioria.** (2016). *Etude d'évaluation sur les services vélos – Enquête sur le stationnement sécurisé intermodal*. ADEME. 46 p.
- **Laa and Leth.** (2020). *Survey of E-scooter users in Vienna: Who they are and how they ride*. Journal of Transport Geography, 89, 102874. <https://doi.org/10/ghgpzz>
- **Lime.** (2019). *Lime pour un Paris durable: Étude sur l'impact environnemental de Lime à Paris 2018-2019*, 31 p.
- **NACTO.** (2019). *Shared Micromobility in the U.S.: 2018*, 15 p.
- **Zirn, Sagert and Rüter.** (2018). *Foldable Electrified Ultralight Vehicles on Public Walkways for Sustainable Traffic Chains*. International Journal of Civil Infrastructure, 1(1), 1-8 p.

- Shared e-scooters
- U.S.
- Unmotorised scooters
- Stuttgart (Germany)
- Shared e-scooters
- Oslo (Norway)
- Shared e-scooters, bikes and mopeds
- Paris (France)
- Shared e-scooters
- Paris (France)
- Shared e-scooters
- Paris (France)
- Personal e-scooters
- Vienna (Austria)

0.8%

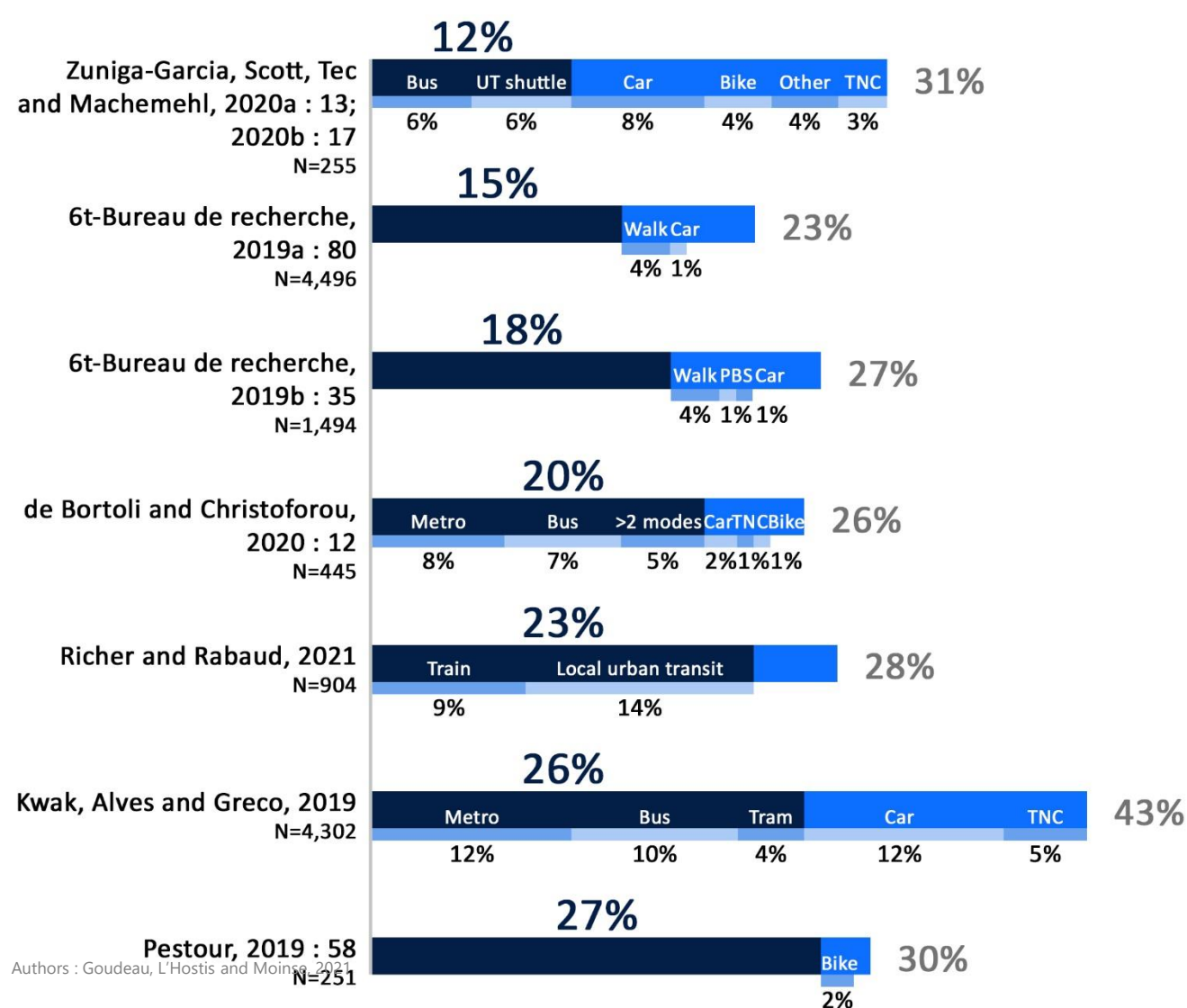
of people accessing to a railway station used a shared/personal kick/electric scooter (Gioria, 2016 : 14)
N=844

0,8% (6t 2020)

- In Europe, a majority use shared e-scooters as a complement to public transport.
- Subway is the dominant mode among trips combined with dockless e-scooters.
- A large proportion of e-scooters owners sometimes or often combine it with transit.
- Through a survey conducted in France, kick/electric scooter users represent 0.8% of people who joined a railway station in 2015.

1. Literature review

Share of e-scooter trips combined with public transport



In France, between 1/5 and 1/4 of the last shared and personal e-scooter trips were combined with public transport.

- Shared e-scooters
- Austin (U.S.)
- Shared e-scooters
- Paris, Lyon and Marseille (France)
- Shared e-scooters
- Paris (France)
- Shared e-scooters
- Paris (France)
- Personal kick/electric scooters
- France
- Shared e-scooters
- São Paulo (Brazil)
- Shared e-scooters
- Paris and Lyon (France)

Legend:

Reference N= Mode % Share of multimodal trips

TNC : Transportation Network Company
PBS : Public Bike Share

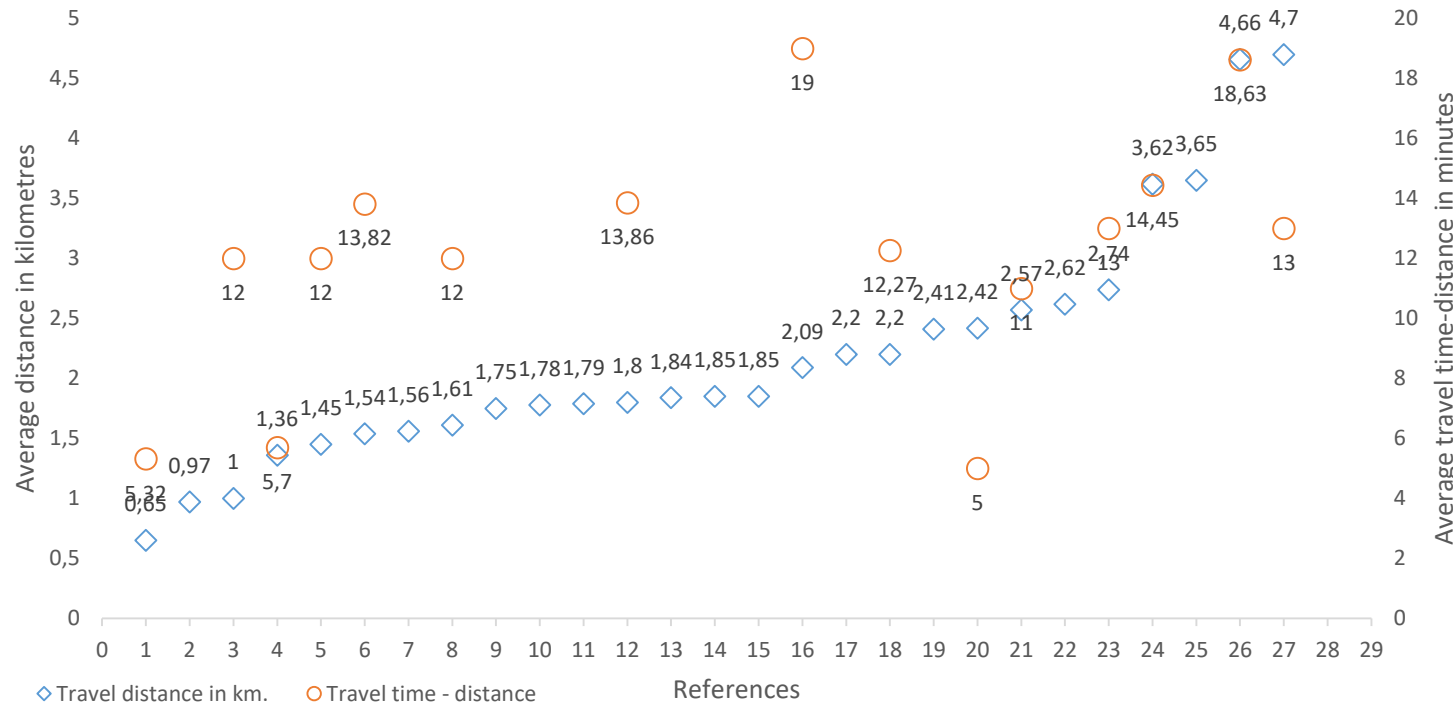
References:

- 6t-Bureau de recherche. (2019a). Usages et usagers des trottinettes électriques en free-floating en France, 158 p.
- 6t-Bureau de recherche. (2019b). Comprendre les usages d'un service de trottinettes électriques en free-floating. Enquête auprès des utilisateurs du service Dott à Paris, 70 p.
- de Bortoli and Christoforou. (2020). Consequential LCA for territorial and multimodal transportation policies: Method and application to the free-floating e-scooter disruption in Paris. Journal of Cleaner Production, 273, <https://doi.org/10/gg5qjn>
- Kwak, Alves and Greco. (2019, juillet 10). Pesquisa de perfil dos usuários de patinetes e bicicleta Yellow em São Paulo. Medium - Grow Mobility.
- Pestour. (2019). Approche socio-économique des enjeux relatifs aux trottinettes électriques en libre-service en France, 92 p. [Mémoire de fin d'études, LAET (Lyon, France)].
- Richer and Rabaud. (2021, mars 16). [Dossier Mobilités] #11 - Micromobilités et intermodalités: L'enjeu des engins de déplacement personnels. construction21.org.
- Zuniga-Garcia and Machemehl. (2020a). Dockless Electric Scooters and Transit Use in an Urban/University Environment, 17 p.
- Zuniga-Garcia et al. (2020b). Evaluation of e-scooters as transit last-mile solution, 25 p.

1. Literature review

Average distances for all types of trips with e-scooters

Monomodal + Intermodal trips



Mean (median) distance: American/European location (Source)

- 0,65 (0,55): Washington, D.C. (U.S.) (McKenzie 2019a : 6)
- (0,97): Austin (Texas, U.S.) (Caspi *et al.*, 2020 : 13)
- 1,00 [euclidean distance]: Oslo (Norway) (Fearnley *et al.*, 2020 : 17)
- 1,36: Paris and Lyon (France) (Coulombel *et al.*, 2020 : 28)
- 1,45: Austin (U.S.) (Bai and Jiao, 2020 : 270)
- 1,54 (1,17): Washington, D.C. (U.S.) (Erdoğan *et al.*, 2020 : 5)
- 1,56 (1,00): France (Richer, 2021)
- 1,61: U.S. (NACTO, 2020 : 10)
- 1,75: France (Fluctuo 2020a : 6)
- 1,78: Europe (Civity Management Consultants, 2019)
- 1,79 (1,46): Washington, D.C. (U.S.) (McKenzie, 2019b : 5)
- 1,80 (1,13): Indianapolis (U.S.) (Mathew *et al.*, 2019 : 44)
- 1,84: Allemagne (Statista Research Department, 2020)
- 1,85: Portland (U.S.) (PBOT, 2018 : 11)
- 1,85: Calgary (Canada) (Sedor and Carswell, 2019 : 8)
- 2,09: Minneapolis (U.S.) (Bai and Jiao, 2020 : 271)
- 2,20: Paris (France) (Apur, Mai 2020 : 27)
- 2,20: Lyon (France) (Pestour, 2019 : 54)
- 2,41: Chicago (U.S.) (City of Chicago, 2020 : 84)
- 2,42: St. George (U.S.) (The Spectrum, 2019)
- 2,57: Baltimore (U.S.) (BCDOT, 2019 : 16)
- 2,62: Louisville (U.S.) (Stevens, 2019)
- 2,74: U.S. (NACTO, 2019 : 11)
- 3,62: Paris (France) (de Bortoli and Christoforou, 2020 : appendices)
- 3,65 (4,00): Germany (Degele *et al.*, 2018 : 3)
- 4,66 (2,75): Paris, Lyon and Marseille (France) (6t Bureau de Recherche, 2019a : 75)
- 4,70 (3,00): Paris (France) (6t Bureau de Recherche, 2019a : 33)

Authors : Goudeau, L'Hostis and Moïnse, 2021

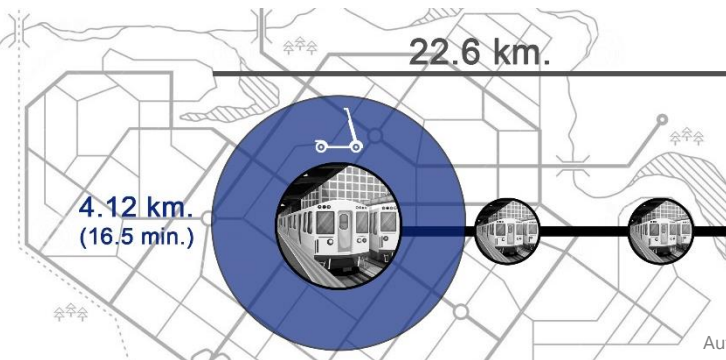
Intermodal trips

4.12
km.

Average distance of **shared** e-scooter rides from/to a public transportation station (median distance: 10 min. / average duration: 16,5 min.), in Paris, Lyon and Marseille. (6-t Bureau de Recherche, 2019b: 79).

22.6
km.

Average distance of intermodal trips that integrated **personal** kick/electric scooters, in France (Rabaud and Richer, 2019 : 7).

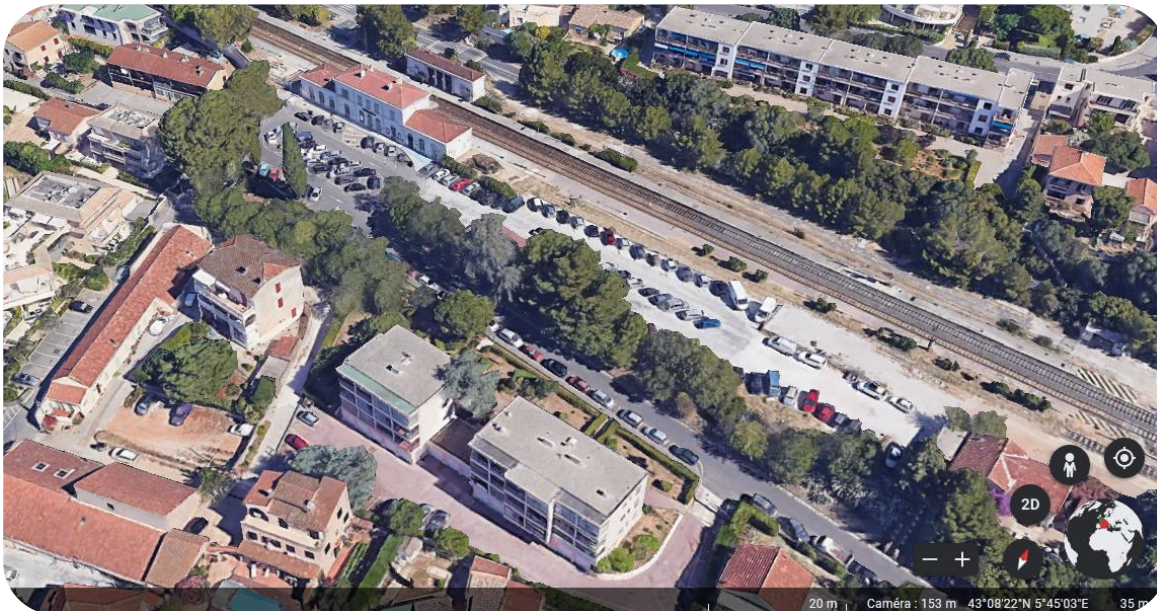


Authors : Goudeau, L'Hostis and Moïnse, 2021

2.

Survey methodology

Bandol train station (Var Department)



Source : Google Earth, 2021

Grasse train station (Alpes-Maritimes Department)



Source : Google Earth, 2021

2. Survey methodology

Case study

Database

- Railway station surveys conducted face to face
- As part of the studies prior to the public utility enquiry for the Provence-Côte d'Azur New Line project
- Property of SNCF Réseau

Survey perimeter: 12 stations in the Provence-Alpes-Côte d'Azur region

Survey period: a Tuesday or a Thursday from the end of September to beginning of October 2020

Sample size: 2,537 passengers, including 53 who accessed the stations by e-scooter

Informations collected:

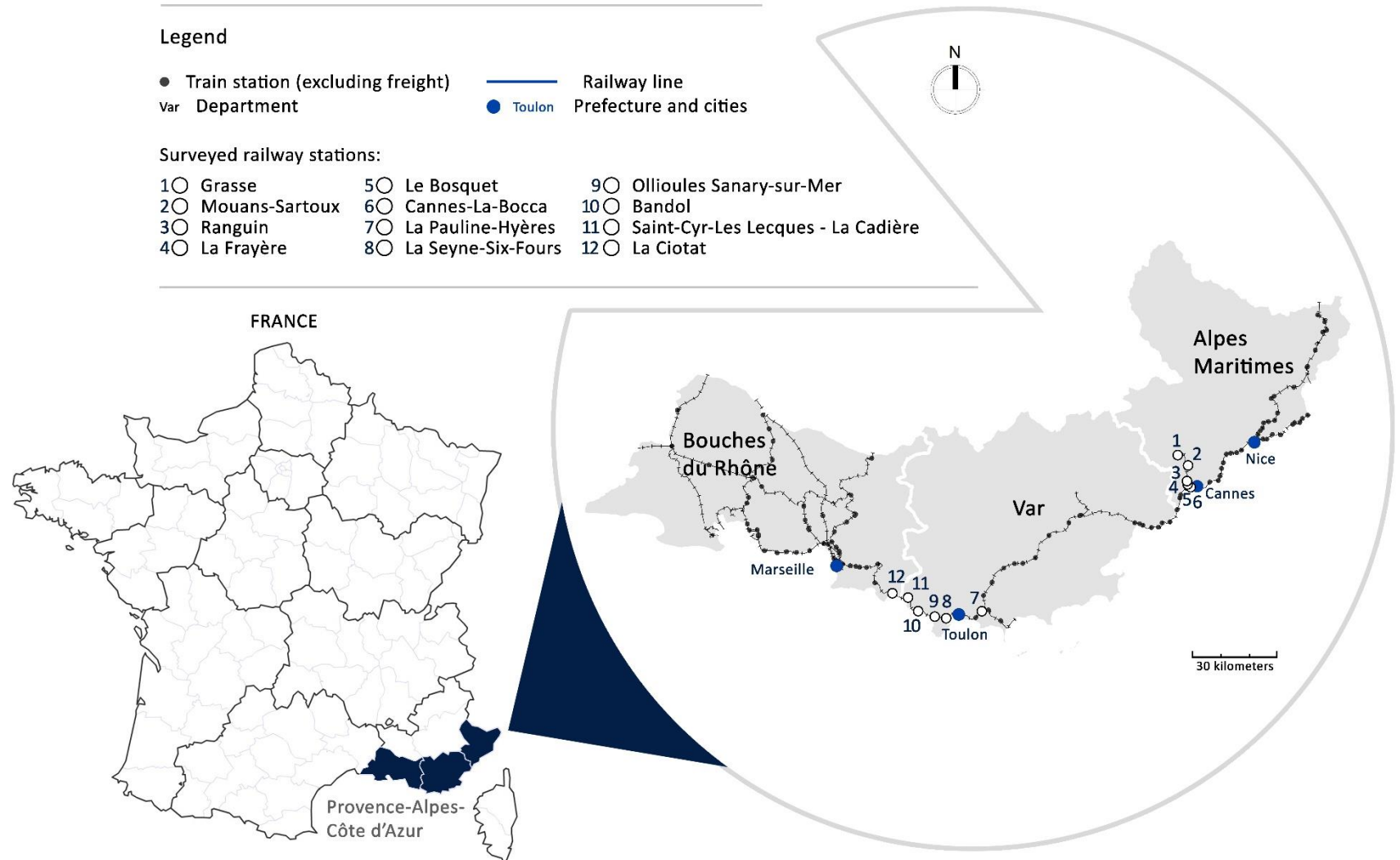
- Age/Gender
- Travel frequency, before COVID-19 and now
- Trip purpose
- Origin-Destination flows: Station and town
- Feeder and distribution modes

Legend

- Train station (excluding freight)
- Var Department
- Railway line
- Toulon
- Prefecture and cities

Surveyed railway stations:

- | | | |
|-------------------|-----------------------|--|
| 1○ Grasse | 5○ Le Bosquet | 9○ Ollioules Sanary-sur-Mer |
| 2○ Mouans-Sartoux | 6○ Cannes-La-Bocca | 10○ Bandol |
| 3○ Ranguin | 7○ La Pauline-Hyères | 11○ Saint-Cyr-Les Lecques - La Cadière |
| 4○ La Frayère | 8○ La Seyne-Six-Fours | 12○ La Ciotat |



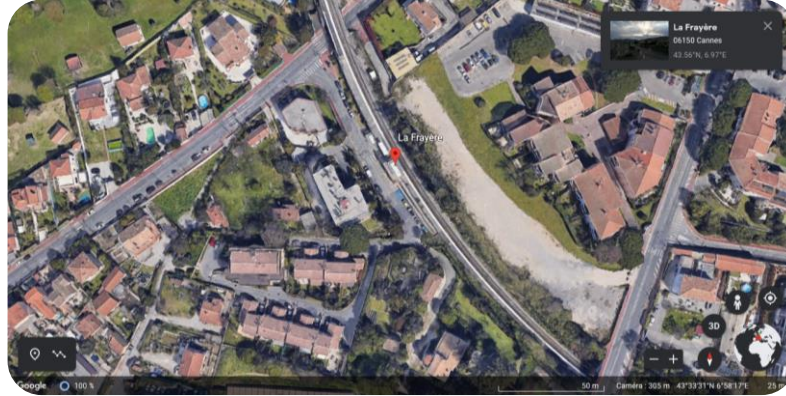
Authors : Goudeau, L'Hostis and Moïnse, 2021
Made with QGIS

3. Results

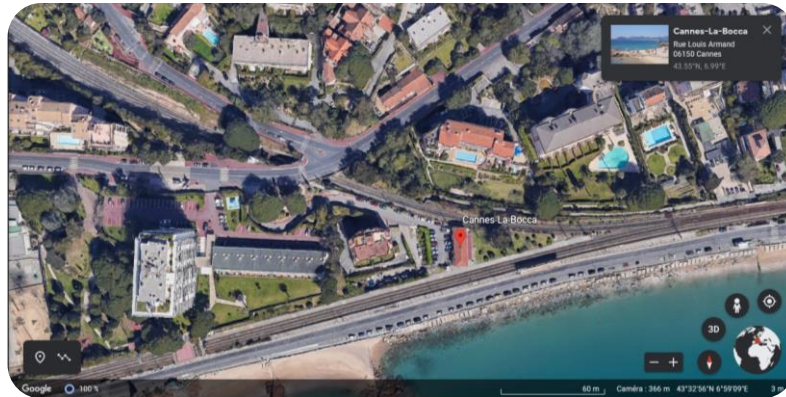
Mouans-Sartoux train station



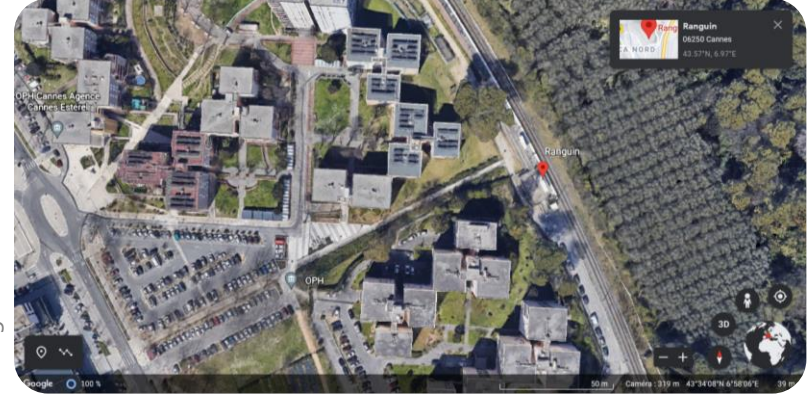
La Frayère train station



Cannes-La-Bocca train station



Ranguin train station



Le Bosquet train station



La Pauline-Hyères train station

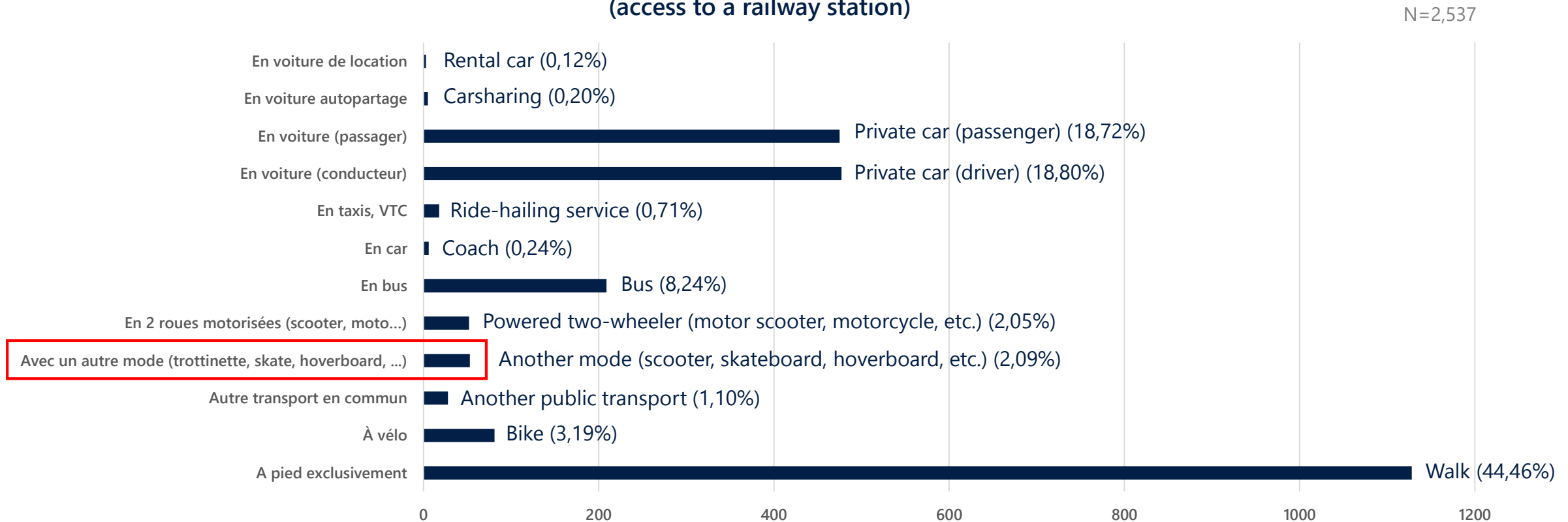


3. Results

Survey sampling

Intermodal trips (September/October, 2020)

Nombre d'enquêtes en fonction du mode de rabattement / Number of respondents by feeder mode (access to a railway station)



Observations carried out in parallel with the administration of the surveys allow us to state that almost all the passengers interviewed who reported had accessed a station "with another mode (scooter, skateboard, hoverboard, etc.)" had indeed used a **scooter**. In the following, we consider that these travellers constitute the sub-sample of travellers accessing a station by scooter.

2,09%

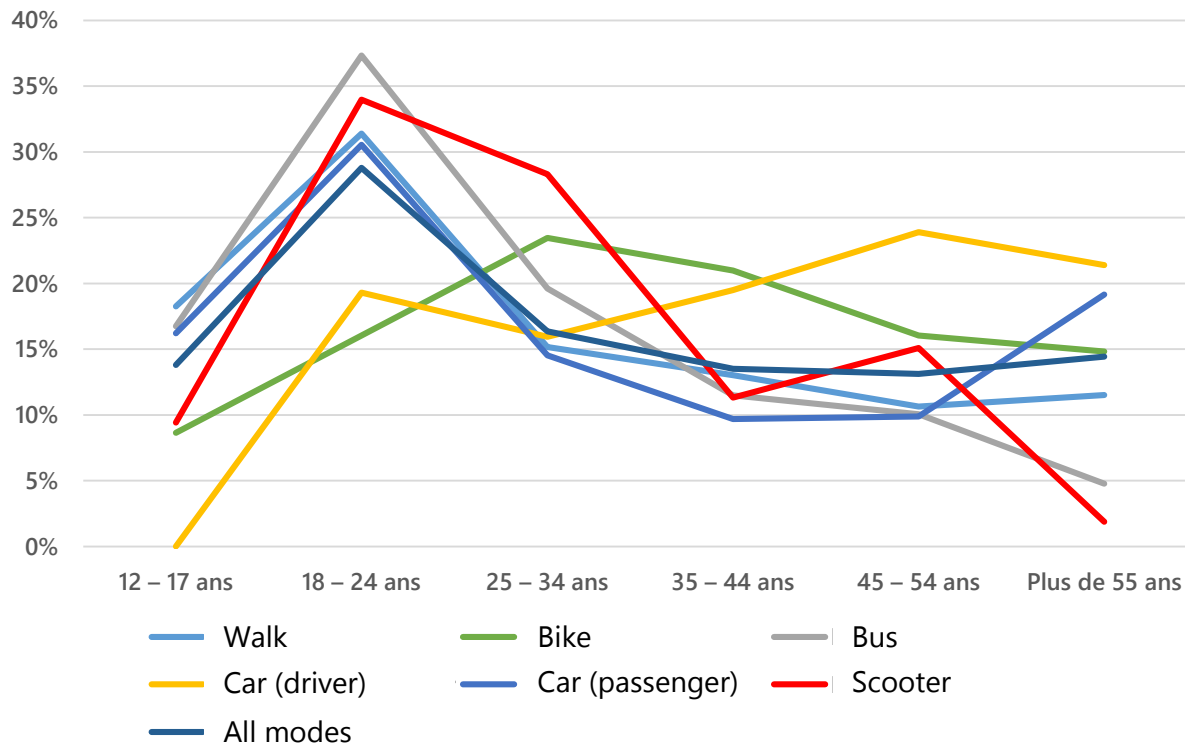
modal share of scooter users accessing the train station
n=53

3. Results

Distribution of users by age and gender

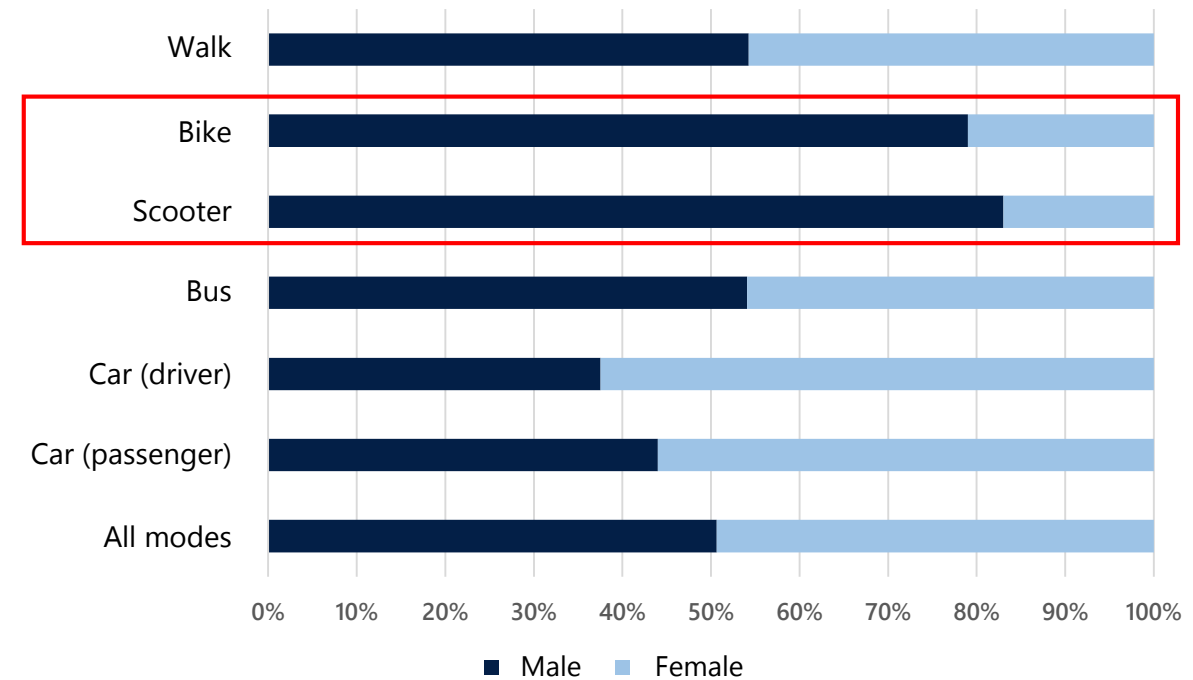
Intermodal trips (September/October, 2020)

Age selon le mode de rabattement / Age by feeder mode



There is an **over-representation** of 18-24 and 25-34 among passengers accessing a station by scooter. We also note that their age profile is significantly different from passengers surveyed accessing a station by bicycle.

Sexe selon le mode de rabattement / Gender by feeder mode



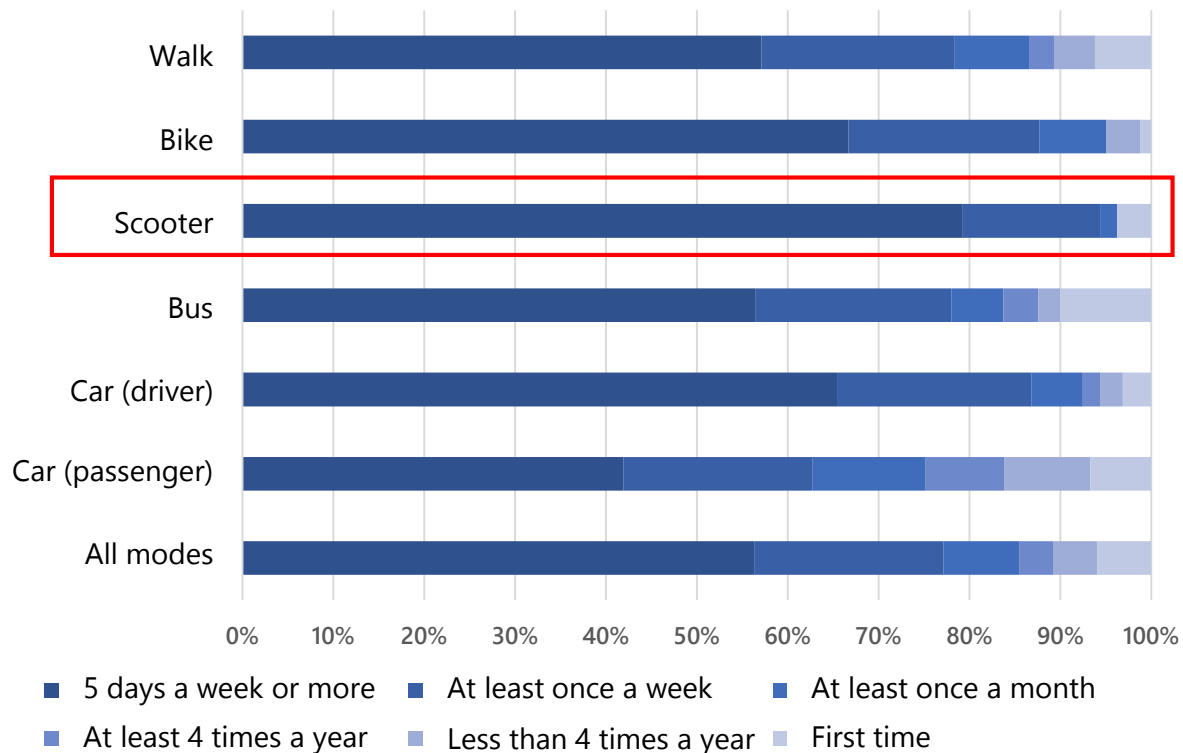
There is a clear **over-representation of men** among the passengers accessing a station by bicycle and even more by scooter.

3. Results

Distribution of users by travel frequency and purpose

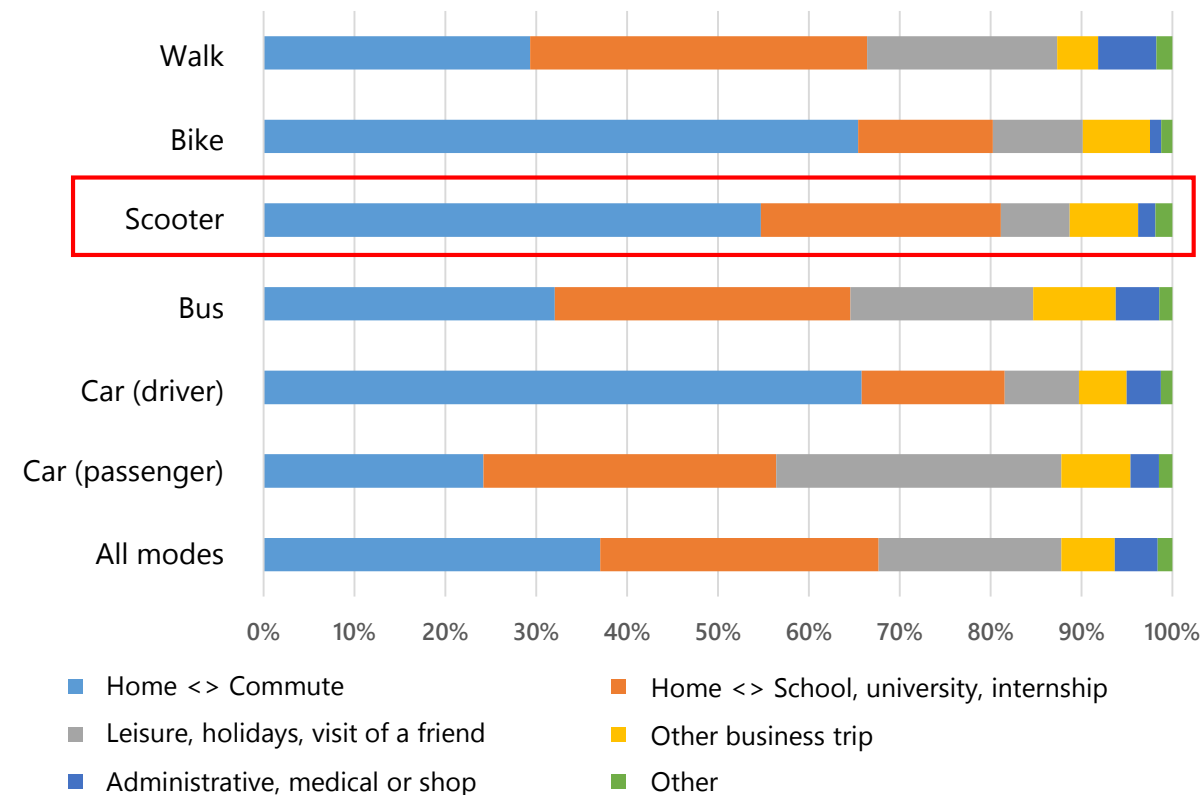
Intermodal trips (September/October, 2020)

Fréquence de déplacement selon le mode de rabattement / Travel frequency by feeder mode



Almost all passengers surveyed who access a station by scooter at the station do so **frequently or very frequently**.

Motif de déplacement selon le mode de rabattement / Trip purpose by feeder mode



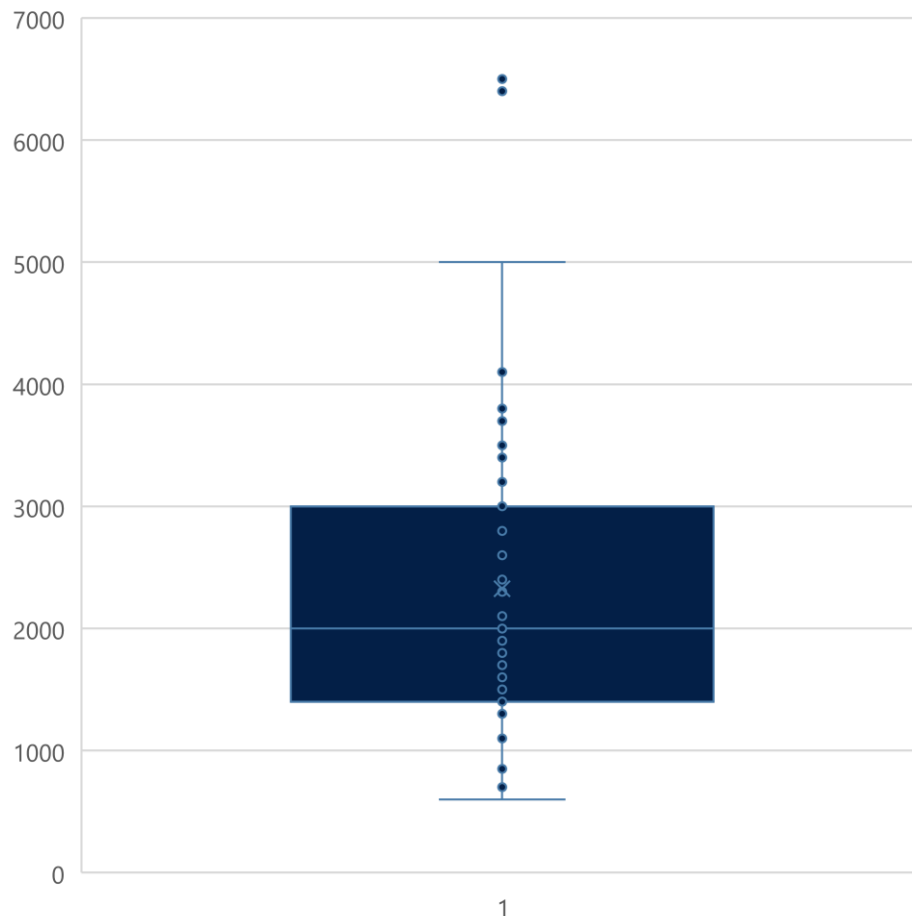
The vast majority of passengers accessing a station by scooter are **commuting (work or study)**. The share of these two reasons is similar to that of travellers surveyed accessing a station by bicycle or car (as a driver) but with a higher proportion of **students**.

3. Results

Estimate of the distance travelled

Intermodal trips (September/October, 2020)

Distance du trajet de rabattement en trottinette (en mètre) / Distance of the scooter trip (in metres)



Third quartile (Q3)

Mean

Median (Q2)

First quartile (Q1)

Distances of scooter feeder trips are estimated from the name of the street indicated by the users, considering:

- For the origin of the trip, the "middle" of the street
- To reach the railway station, the shortest route

The **distance** of the scooter trip to the station was estimated from 46 responses: From this sample, we find:

2,000

The median distance (in metres)

2,395

The average distance (in metres)

600

The minimum distance (in metres)

6,500

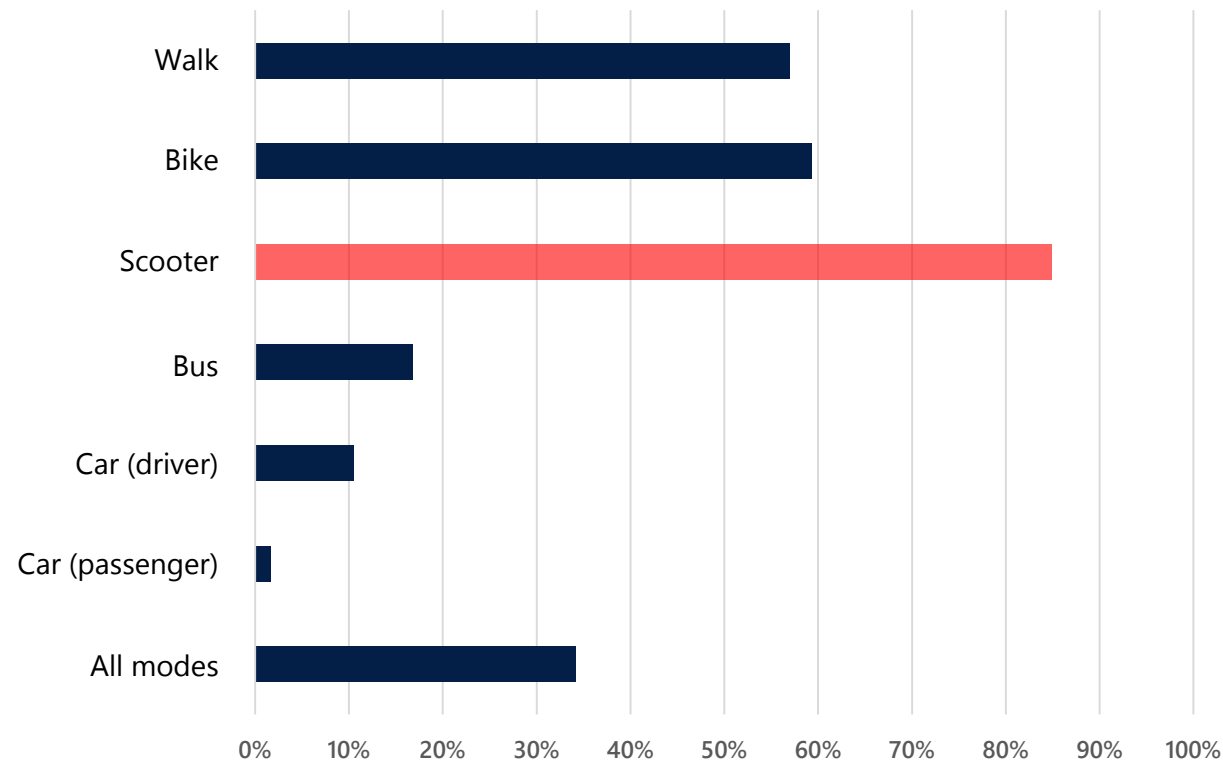
The maximum distance (in metres)

3. Results

Estimate of the distance travelled

Intermodal trips (September/October, 2020)

Proportion de voyageurs enquêtés dont le mode de diffusion est identique au mode de rabattement / Share of passengers who travel to and from the station by the same mode



It can be seen that a large majority of passengers who access a station by scooter also use from the destination station.

On this indicator, the scooter clearly stands out from other modes of access to stations, including walking and cycling.

Compared to walking, the scooter, especially if it is electric, can cover **greater distances** and thus reach a wider range of destinations from the destination station.

Compared to the bicycle, the scooter has the advantage of being **light and compact**, and therefore easy to **take on board** the train, even in busy periods.

Thus, whereas two-thirds of passengers surveyed combine three modes (including walking) to make their trip, **85% of passengers** who access railway stations by scooter limit themselves to using **two modes**.

Conclusion

Similar characteristics and use with bike:

- Gender
- Travel frequency
- Trip purpose

And some differences with bike:

- Age
- Both access and egress

Play a role in the carbon-free mobility system and sustainable territories:

- Potential for modal shift from private car to scooter
- Challenge of urban design around train stations: Accessibility can be promoted to all
- Supports the hypothesis of extended railway station areas

La Seyne-Six-Fours train station



Source : Google Earth, 2021

Ollioules - Sanary-sur-Mer train station



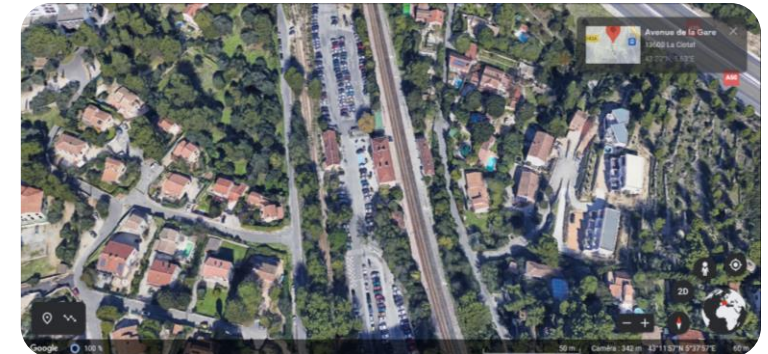
Source : Google Earth, 2021

Saint-Cyr-Les Lecques - La Cadière train station



Source : Google Earth, 2021

La Ciotat train station



Source : Google Earth, 2021

Matthieu GOUDEAU

Projet Manager - AREP Flux et Mobilités
Matthieu.GOUDEAU@arep.fr

Alain L'HOSTIS

Research Director - Laboratoire Ville Mobilité Transports (Université Gustave Eiffel)
alain.lhostis@univ-eiffel.fr

Dylan MOINSE

PhD student - Laboratoire Ville Mobilité Transports (Université Gustave Eiffel)
dylan.moinse@univ-eiffel.fr