

LE TRAIN DES MERVEILLES

Mobility analysis - Alpes Maritimes

Groupe E

Rémi BETAILLE
Lorenzo FREIRE-STELLA
Doriane MARTINS-RIBEIRO
Simon TESSIER

Riviera Seminar

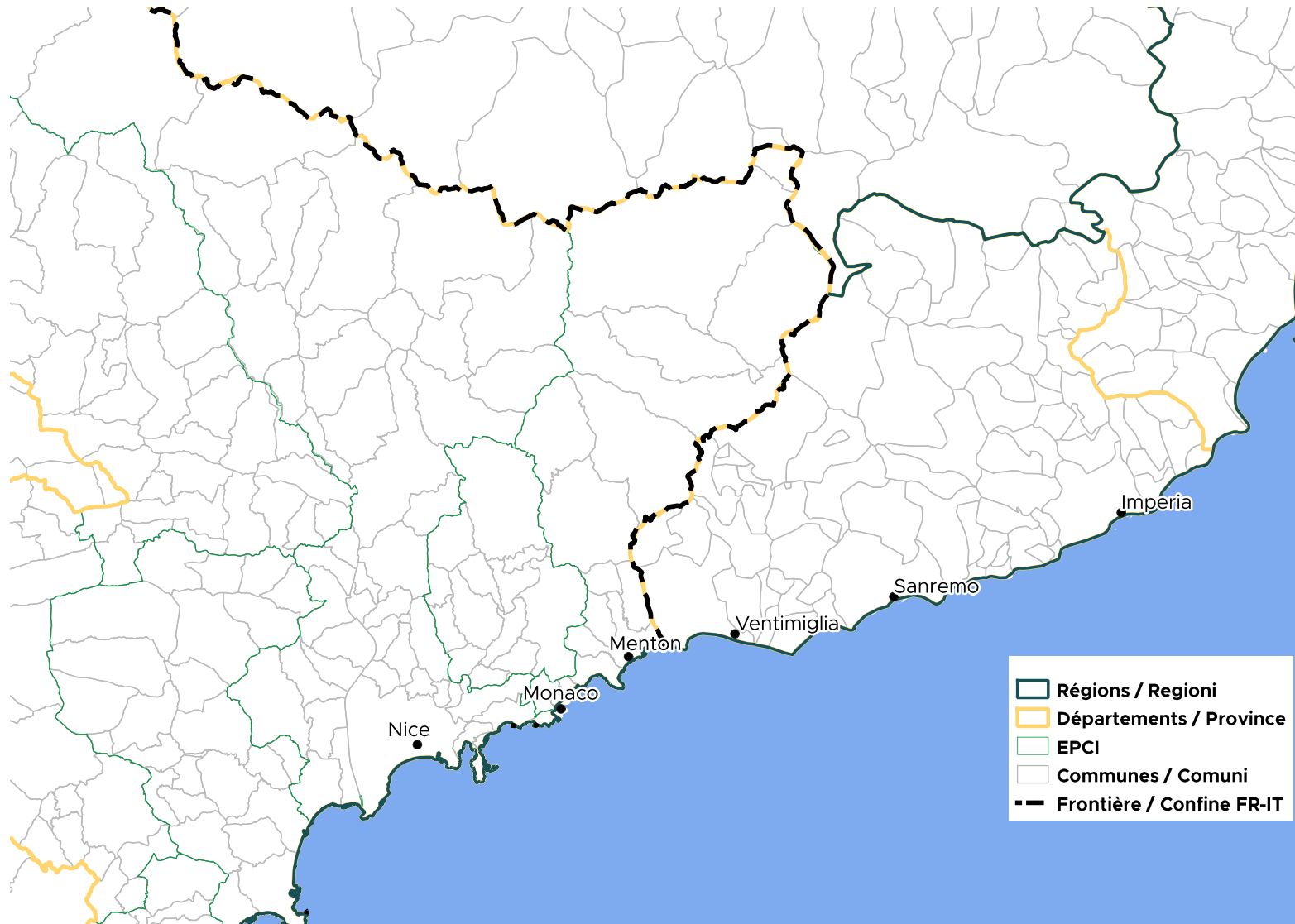
Prof. Laurent Guihéry (CY Cergy Paris)
Prof. Silvio Nocera (IUAV)
Master TTE 1
AA. 2023-2024

Index

1. Introduction
2. Diagnostic
 1. Transport Offer
 2. Transport Demand
3. Criticalities analysis
4. New development of Train des Merveilles
 1. History and current state of the line
 2. Ideas of services to offer in the stations
 3. Touristic Train offer

Introduction :

A mobility study in Alpes Maritimes



- Cross-border study from two classes of CY Cergy Paris University & IUAV University of Venice
- One continuous territory along the coast, through the border
 - Same dynamics and facing same
- Solutions identified could be developed to both of territories

FR : Alpes-Maritimes

IT : Provincia d'Imperia

Ponctuality

Carpooling

Trains

Road system

Buses

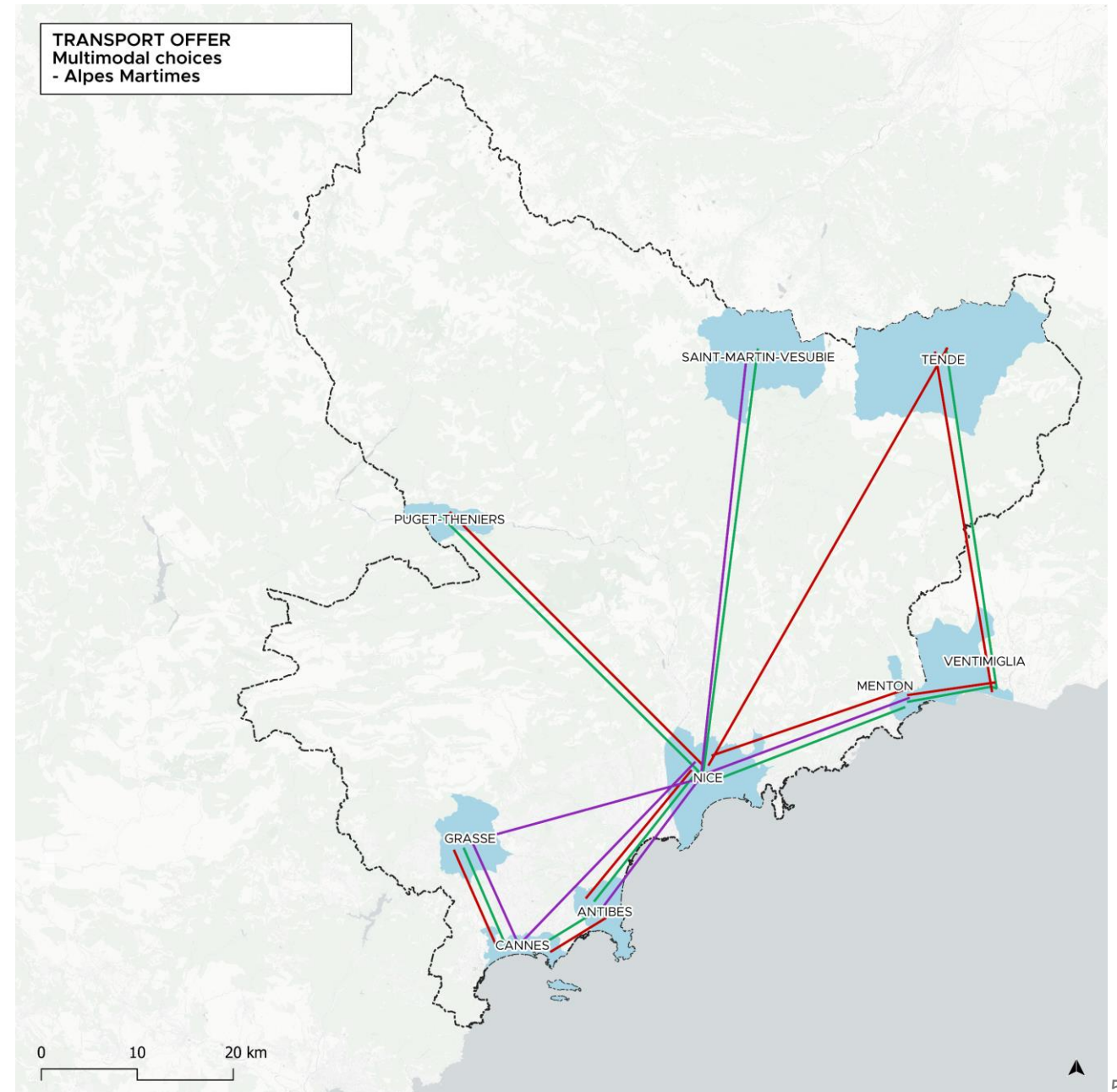
Multimodality

Transport Offer

Multimodal choices alternatives

- Different multimodal options between the main towns in the Alpes-Maritimes department
- Mobilities are organised around Nice, despite the city's remote location
 - Explained by the relief of Nice's hinterland, as well as the size of the population on the coast.
- Many modes of transport from Nice onwards, but relatively none between the towns far from Nice
- Few relations between the Hinterland

Sources : Apple Maps (Car and Train) ; Zou! (Bus)



Multimodal matrix : times

	1	2	3	4	5	6	7	8	9
1	00:00								
	00:00								
	00:00								
2	00:54	00:00							
	00:32	00:00							
	00:12	00:00							
3	01:33	00:45	00:00						
	00:41	00:34	00:00						
	00:42	00:28	00:00						
4	02:30	02:51	03:07	00:00					
	00:58	01:01	01:01	00:00					
	01:05	01:17	01:47	00:00					
5	00:43	00:45	01:07	01:35	00:00				
	00:40	00:43	00:43	00:38	00:00				
	00:27	00:39	01:09	00:34	00:00				
6	02:19	02:40	02:57	03:12	01:47	00:00			
	01:19	01:18	01:19	01:24	01:07	00:00			
	02:26	02:39	03:39	02:41	01:39	00:00			
7	02:25	02:52	02:48	03:43	01:15	03:23	00:00		
	01:26	01:29	01:35	01:31	01:21	01:15	00:00		
							00:00		
8	04:32	05:09	05:27	02:08	03:48	06:01	06:51	00:00	
	02:23	02:26	02:12	01:14	01:40	02:34	02:15	00:00	
	03:11	03:23	03:55	02:23	02:18	06:56		00:00	
9	02:55	03:22	03:18	00:25	02:12	04:16	05:46	01:43	00:00
	01:19	01:17	01:18	00:21	00:54	01:40	02:00	00:58	00:00
	01:21	01:33	02:03	00:15	00:51	02:57		01:31	00:00

*Reading method: Row 5,
Column 3*

Between Nice and Grasse,
the journey takes 1 hour and
7 minutes by bus, 43 minutes
with the car and 1 hour and 9
minutes by train

Cities		Country
1	Antibes	France
2	Cannes	
3	Grasse	
4	Menton	
5	Nice	
6	Puget-Théniers	
7	Saint-Martin-Vésubie	
8	Tende	
9	Ventimiglia	Italy

Vehicles		Sources
Buses		Lignes d'Azur / Zou !
Cars		Apple Maps' GPS
Trains		SNCF Connect / Chemins de fer de Provence

Multimodal matrix : cost

	1	2	3	4	5	6	7	8	9
1	0€								
	0€								
	0€								
2	2,10€	0€							
	3,70€	0€							
	3,80€	0€							
3	2,10€	2,10€	0€						
	4,51€	1,93€	0€						
	8,10€	5,40€	0€						
4	29€	39€	19,50€	0€					
	12,15€	14,51€	15,51€	0€					
	10,60€	12,60€	16€	0€					
5	2,10€	19,50€	2,10€	3,80€	0€				
	4,46€	6,85€	7,86€	6,36€	0€				
	5,70€	8,40€	11,90€	6,40€	0€				
6	3,80€	3,80€	3,80€	4,20€	2,10€	0€			
	9,21€	11,50€	12,50€	13,11€	6,41€	0€			
	15,90€	18,60€	22,10€	16,60€	10,20€	0€			
7	3,80€	3,80€	3,80€	3,80€	1,70€	3,80€	0€		
	9,30€	11,59€	12,60€	13,20€	6,51€	7,31€	0€		
							0€		
8	5,80€	5,80€	5,80€	5,80€	5,80€	7,80€	5,80€	0€	
	16,96€	19,23€	20,23€	5,66€	11,22€	19,49€	10,21€	0€	
	19,20€	21€	24,70€	19,70€	15,80€	26€		0€	
9	5,80€	5,80€	5,80€	5,80€	5,80€	5,80€	5,80€	5,80€	0€
	12,80€	15,18€	16,30€	17,22€	7,18€	15,44€	13,62€	4,51€	0€
	12,80€	14,80€	18,00€	19,00€	9,20€	19,20€		21,70€	0€

Cities		Country
1	Antibes	France
2	Cannes	
3	Grasse	
4	Menton	
5	Nice	
6	Puget-Théniers	
7	Saint-Martin-Vésubie	
8	Tende	
9	Ventimiglia	Italy

Vehicles		Sources
	Buses	Zou! / Lignes d'Azur
	Cars	Mappy
	Trains	SNCF Connect / Chemins de fer de Provence

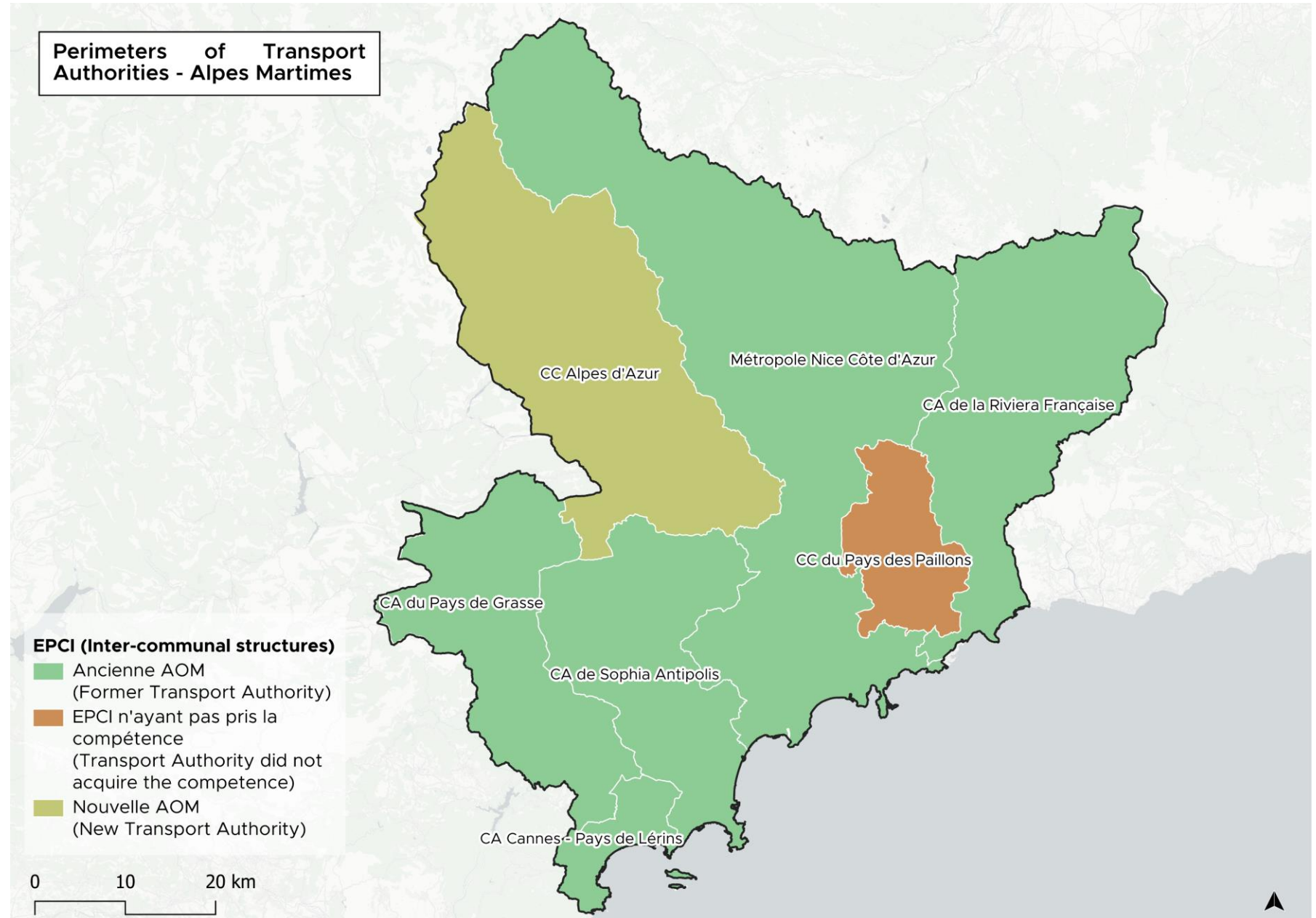
Reading method: Row 9, Column 3

Between Ventimiglia and Grasse, the journey costs at least 5.80€ by bus, 16.30€ with a car and the train ticket costs 18€



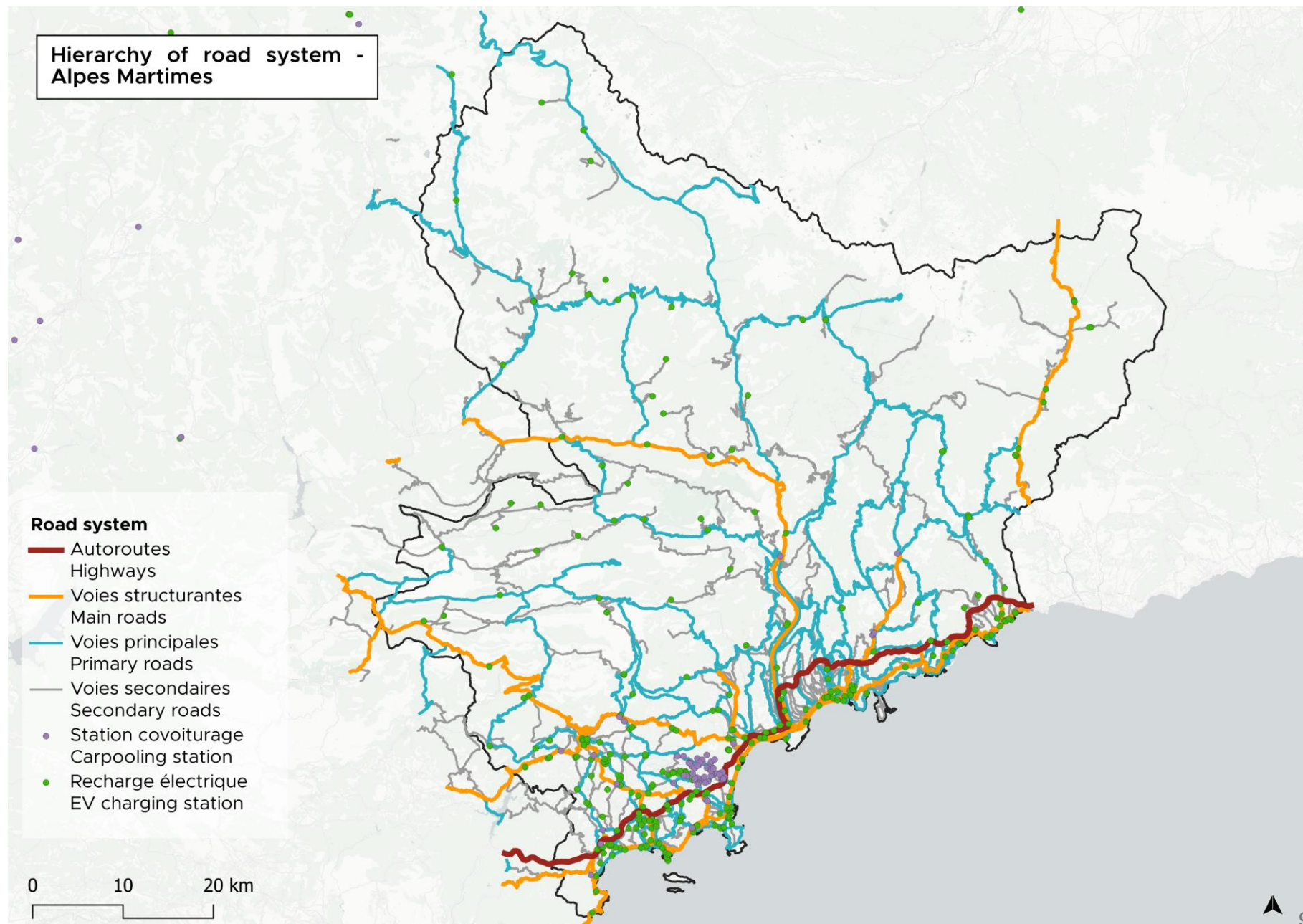
Transport Authorities

- Inter-communal structures can in France acquire the charge of transportation.
- They organise the transport systems, the offre, the prices, the mobilities in their Territories (for local moves)
- 6 inter-communal structures in the Alpes-Maritimes. All of them are organising transport authorities except the smaller structure

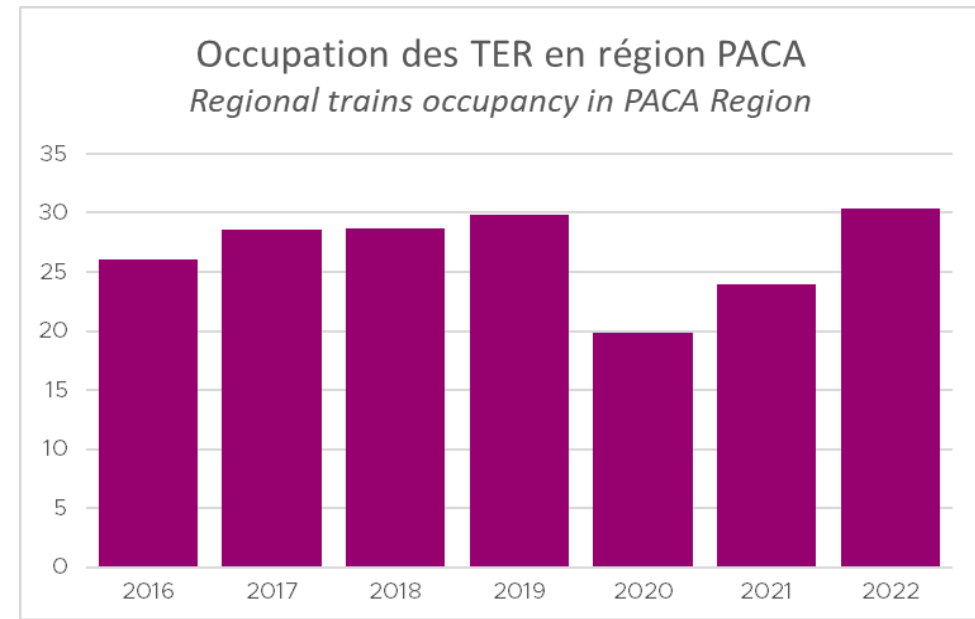
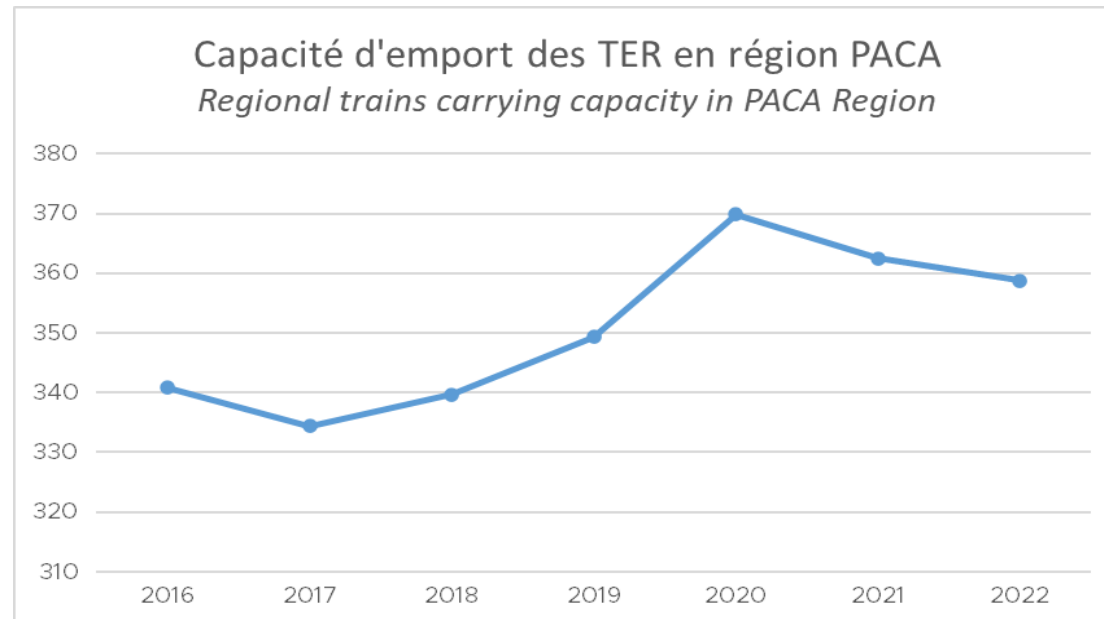
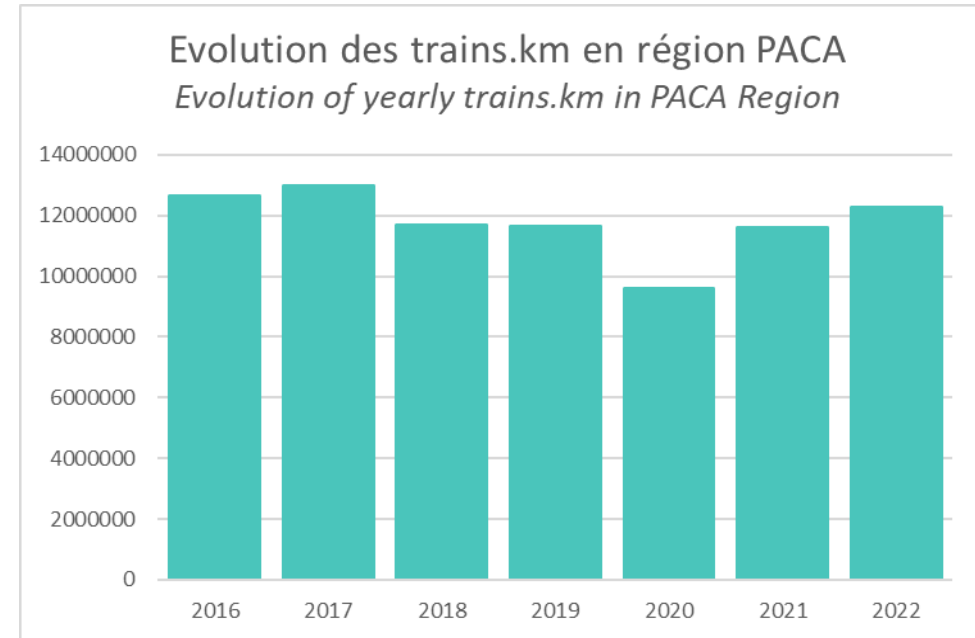
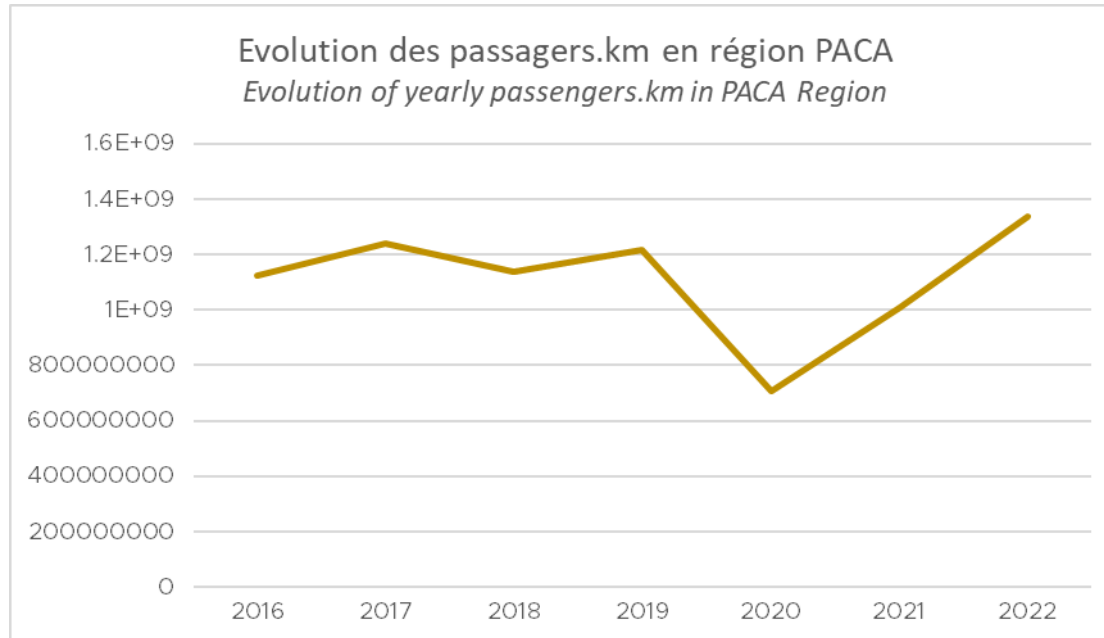


Road Transport

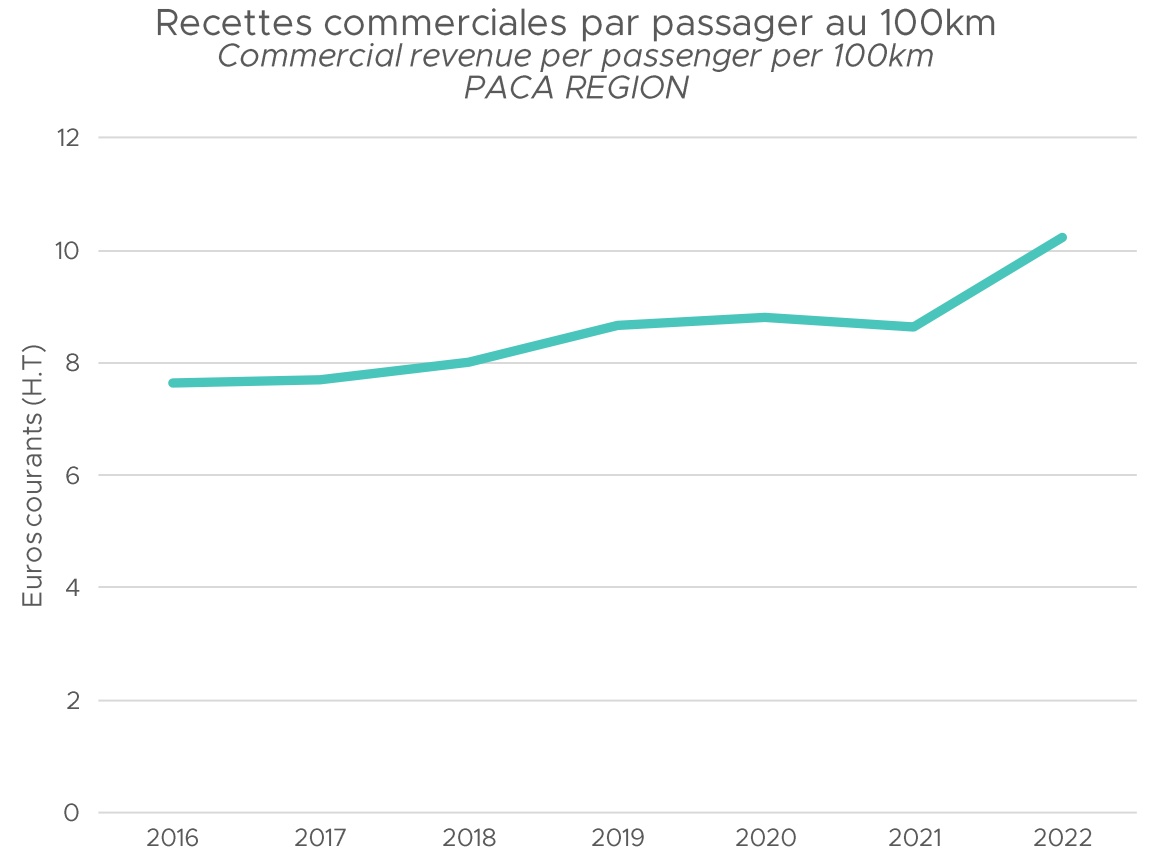
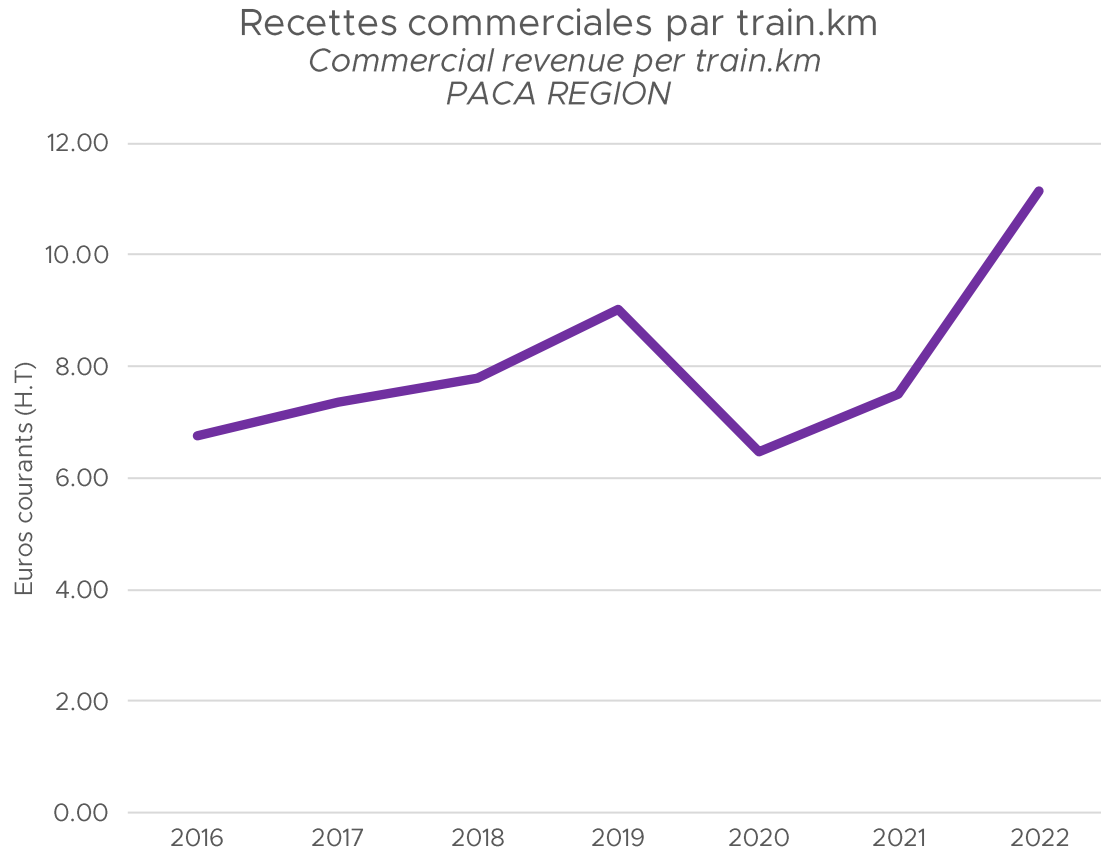
- Road system in the Alpes-Maritimes territory is organised along the coast with the main roads and the only highway going through the department
- Highway between the Mediterranean cities (Barcelona, Montpellier, Marseille, Toulon, Nice Genova, etc.)
- Other main roads linking Nice to neighbouring regions and cities such as Grasse, Digne-les-Bains, Cuneo and Torino)
- Actual poor network of carpooling station and EV stations along the coast only



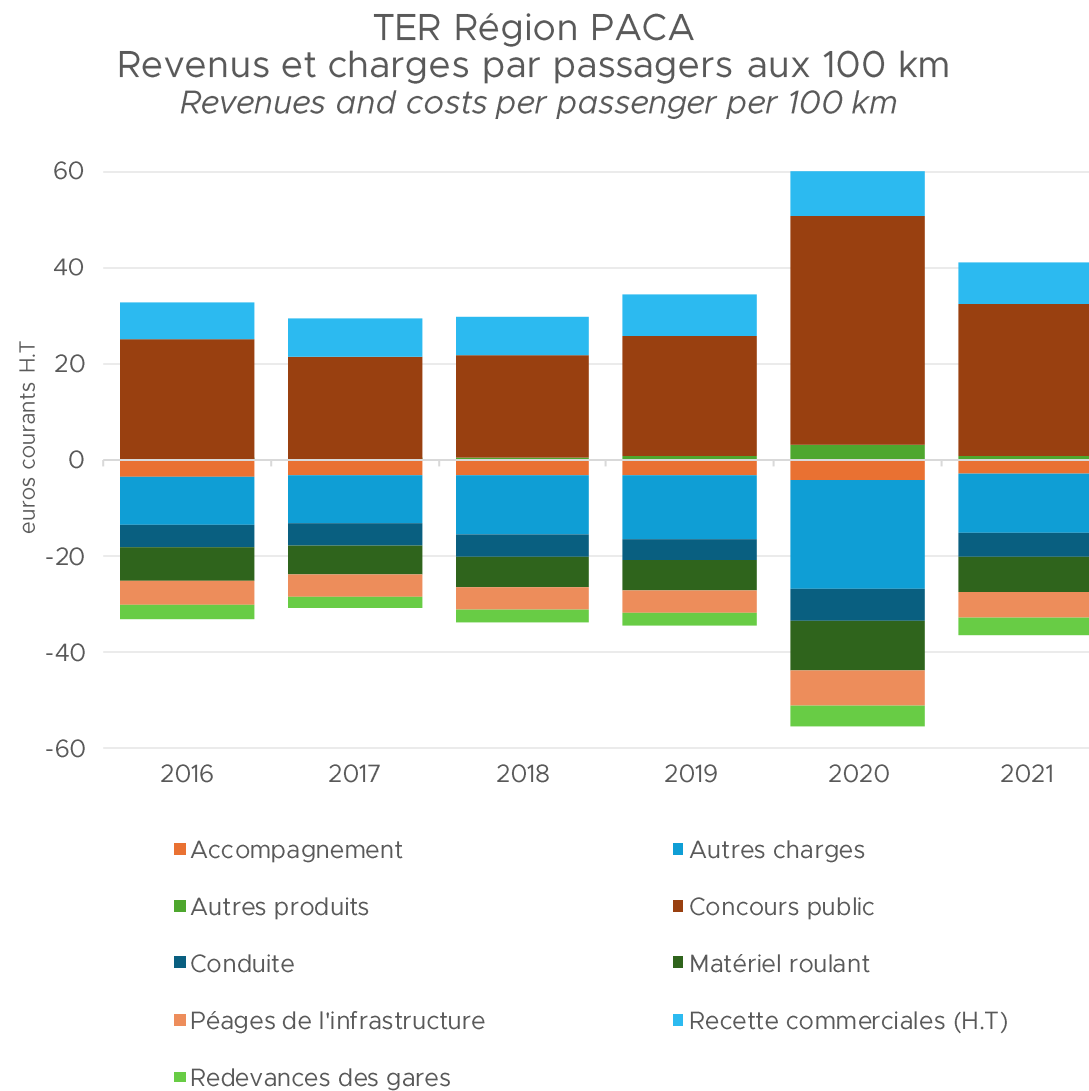
Regional Rail Transport : Main indicators



Regional Rail Transport : Costs



Regional Rail Transport : Costs details

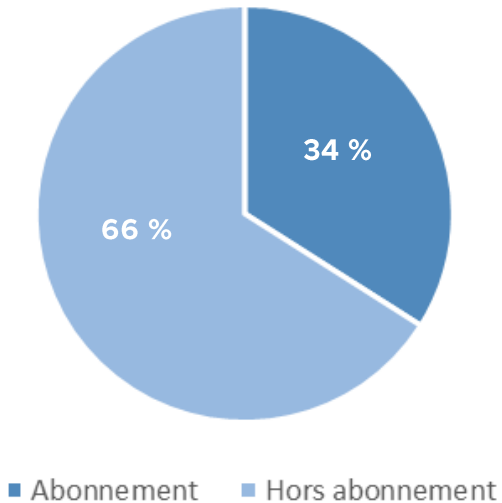


Source : Autorité de Régulation des Transports

Regional Rail Transport : Revenue details

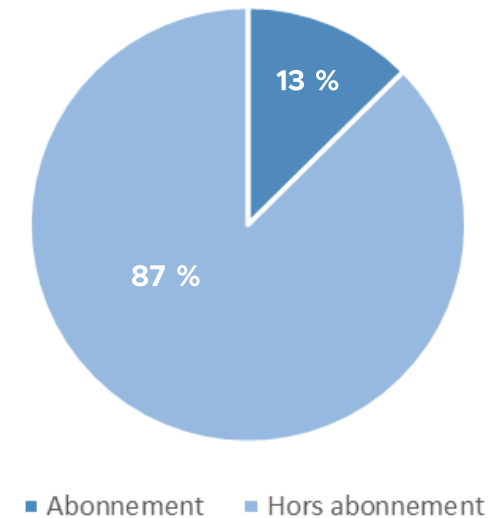
Passagers.km

Quelle part de marché des abonnés / non abonnés dans les services TER Paca en 2022



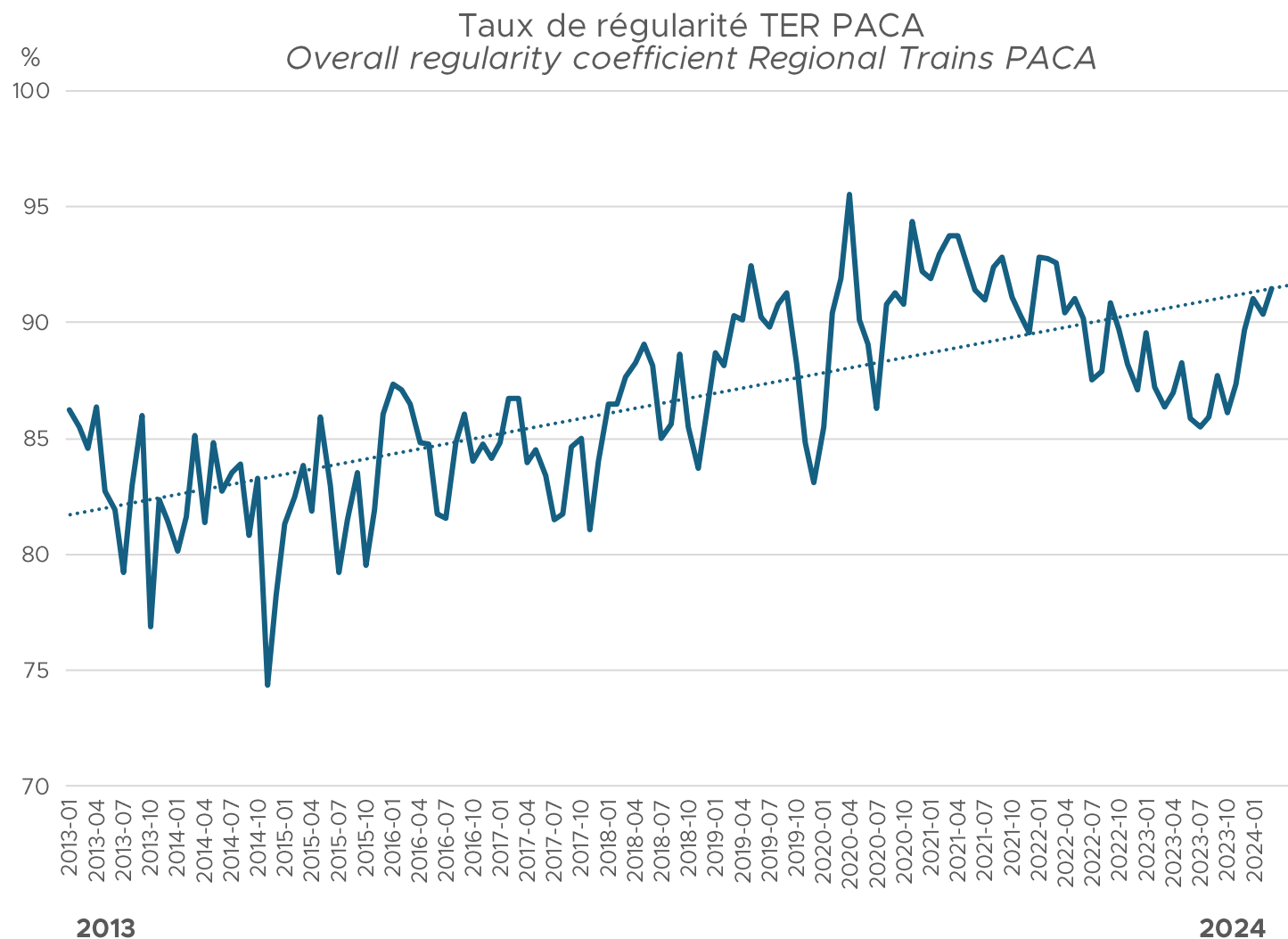
Recettes commerciales

Quelle part de marché des abonnés / non abonnés dans les services TER Paca en 2022



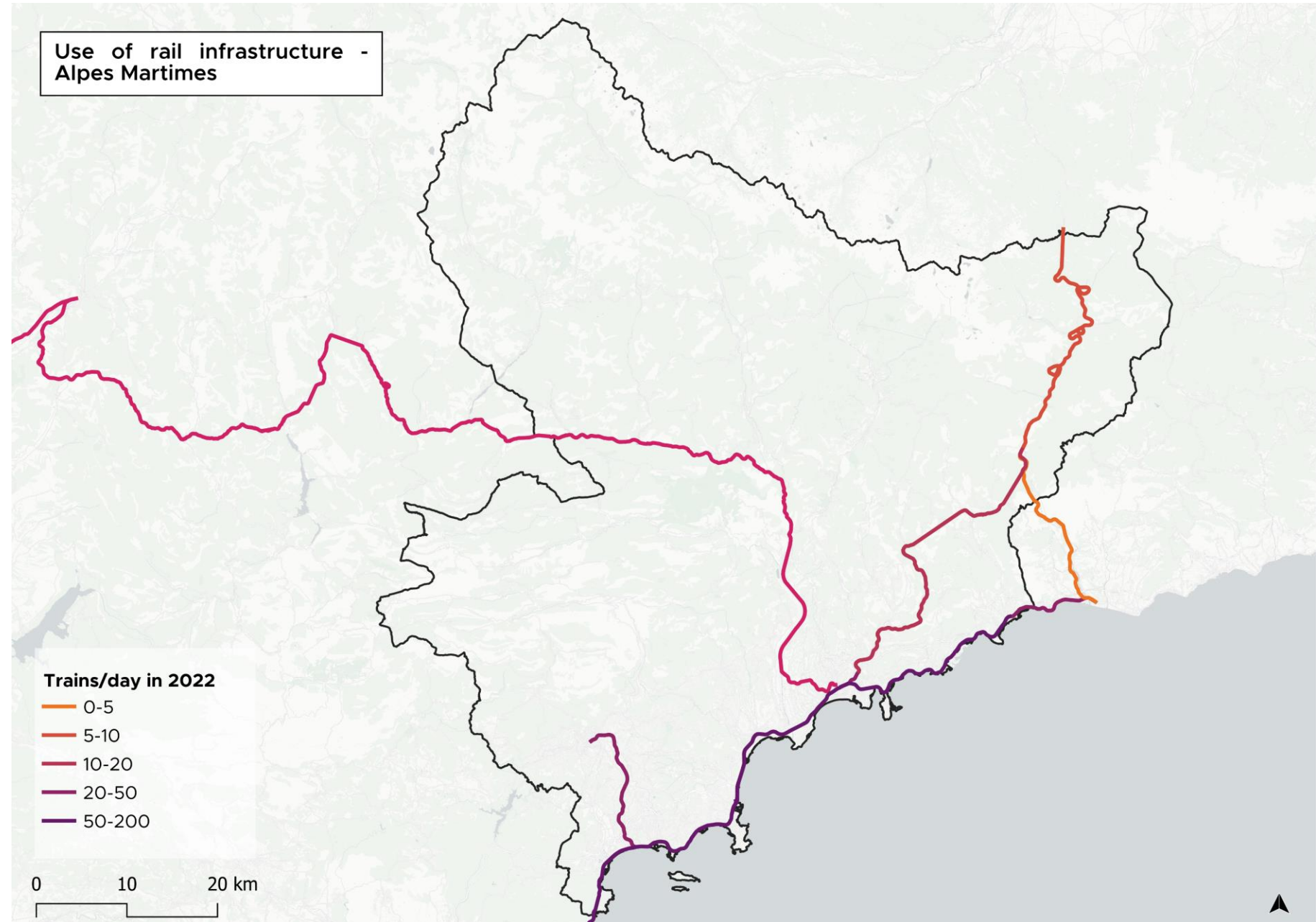
Regional Rail Transport : Regularity

- Actual operator : SNCF Voyageurs
- Regularity coefficient has been increasing since 2013 to reach around 91% now
- New entrant for Lot 1 Inter-Métropoles : Transdev from mid-2025



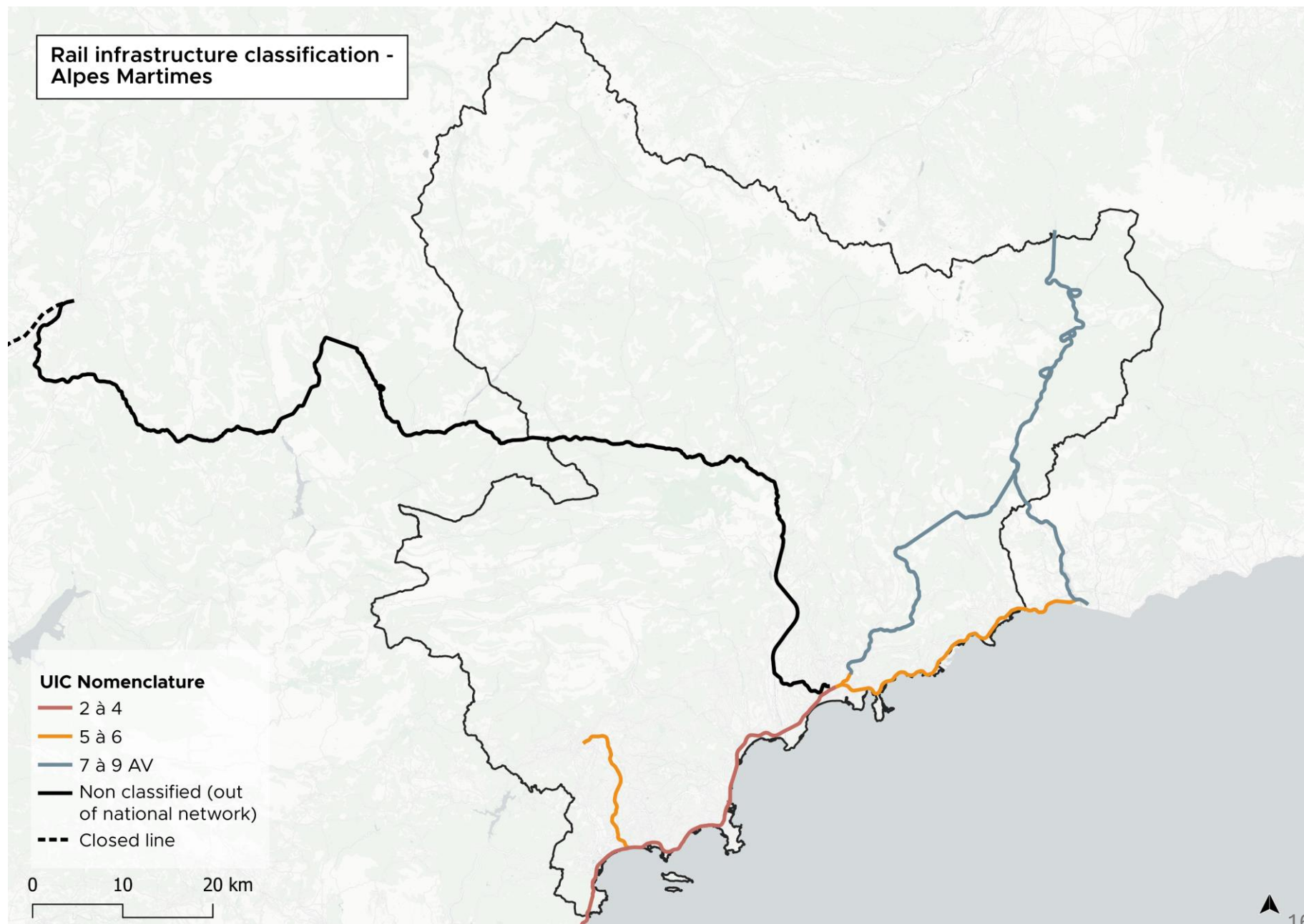
Rail Transport : Network

- Main traffic happening on the coast
- Between Nice and Marseille up to 17 trains daily and 10 to Paris
- Eastern part also busy with up to 47 trains daily to Menton and 32 to Ventimiglia
- In the hinterland, around 20 trains daily to Grasse and around 10 to Breil sur Roya
- On the CFP network, up to 6 trains to Digne-les-Bains daily, and up to 30 to Plan-du-Var.



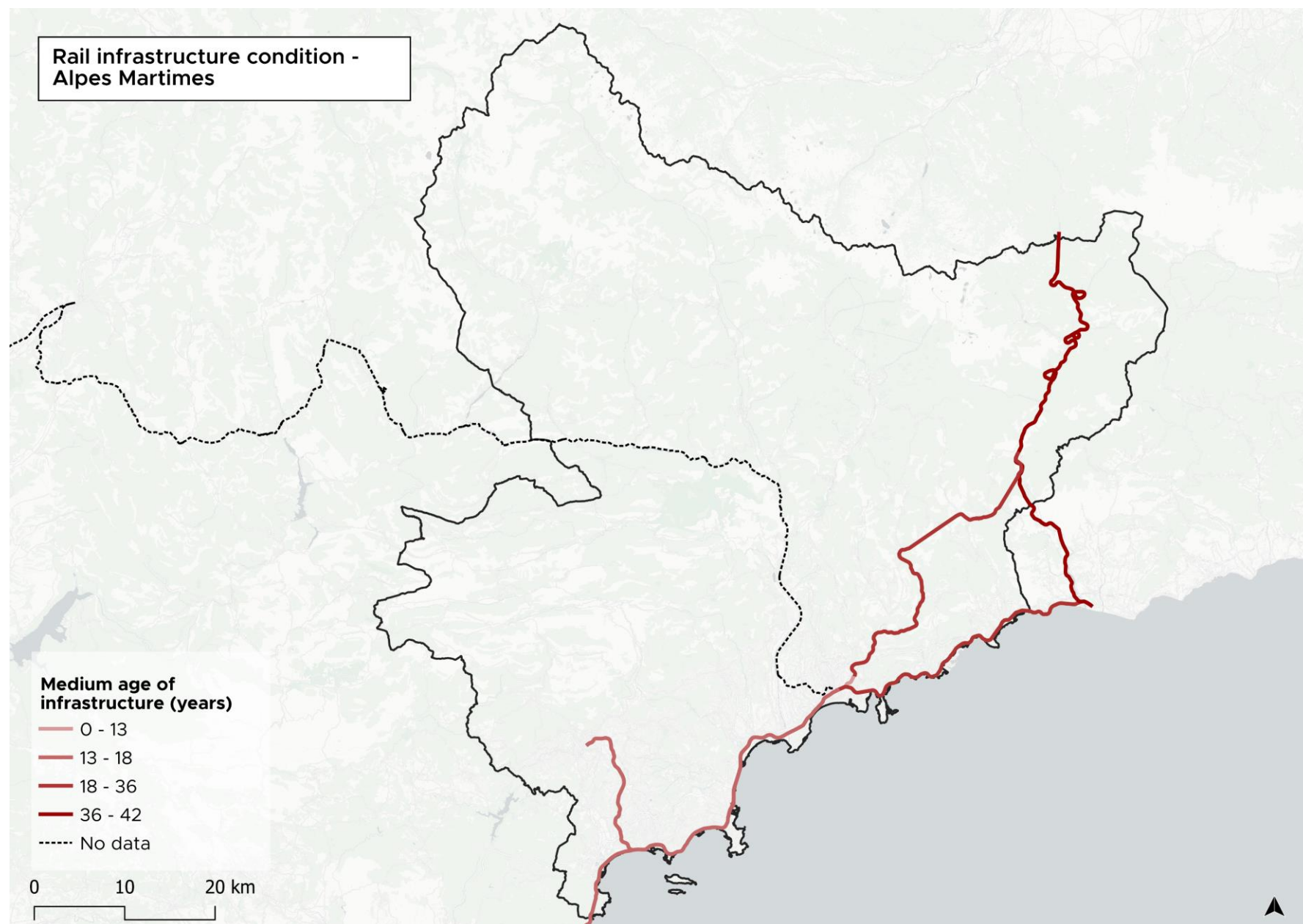
Rail Transport : Network

- Train des Merveilles is classified as « Petite Ligne de desserte fine du territoire »
- Classification is based on number of circulations
- 7 to 9 UIC is the lowest classification in the French network grid



Rail Transport : Network

- Lines in the hinterland are much older than the lines on the coast, especially those to the west of Nice (to Marseille and Paris, TGV services)
- The Merveilles Line is the oldest line in the area : maintenance is highly needed now (closing of the line from september 2025)



Transport Demand

Commuters

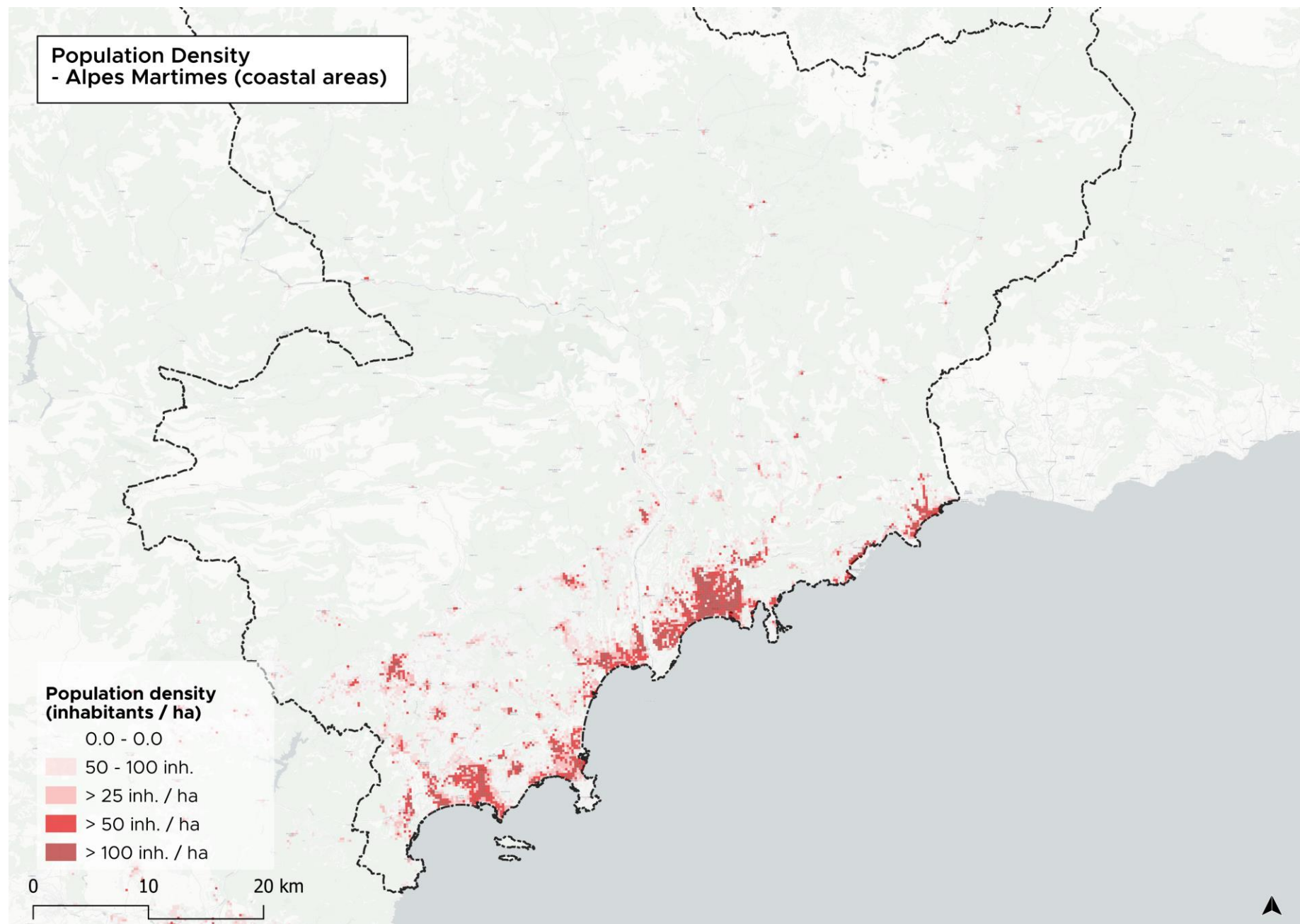
Home-work mobilities

Modal share

Transport authorities

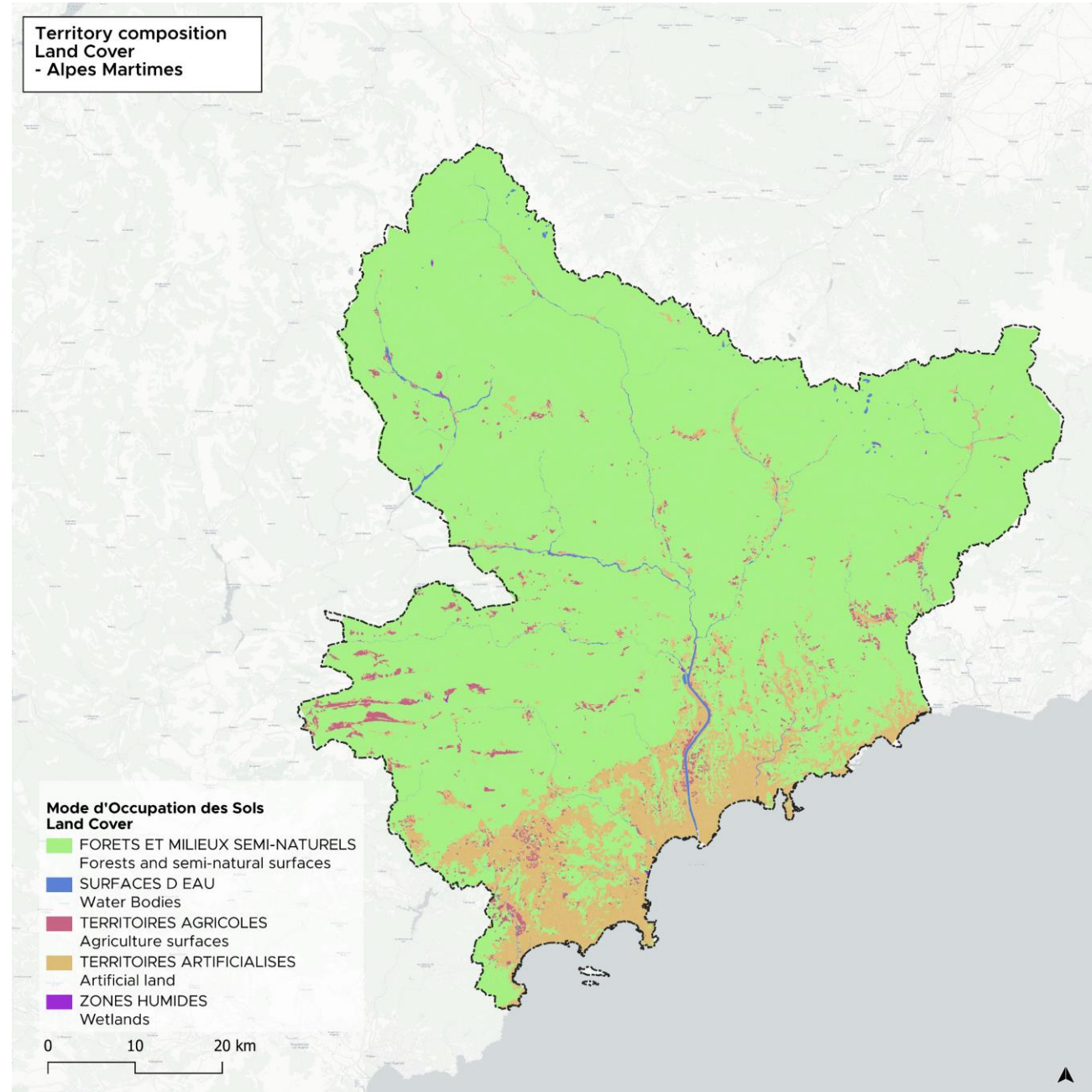
Territory composition : density

- Very dense urban areas
- Ponctual diffused nodes in the upper territory :
Moyen-Pays et Haut-Pays
- Urban centralities as well for jobs



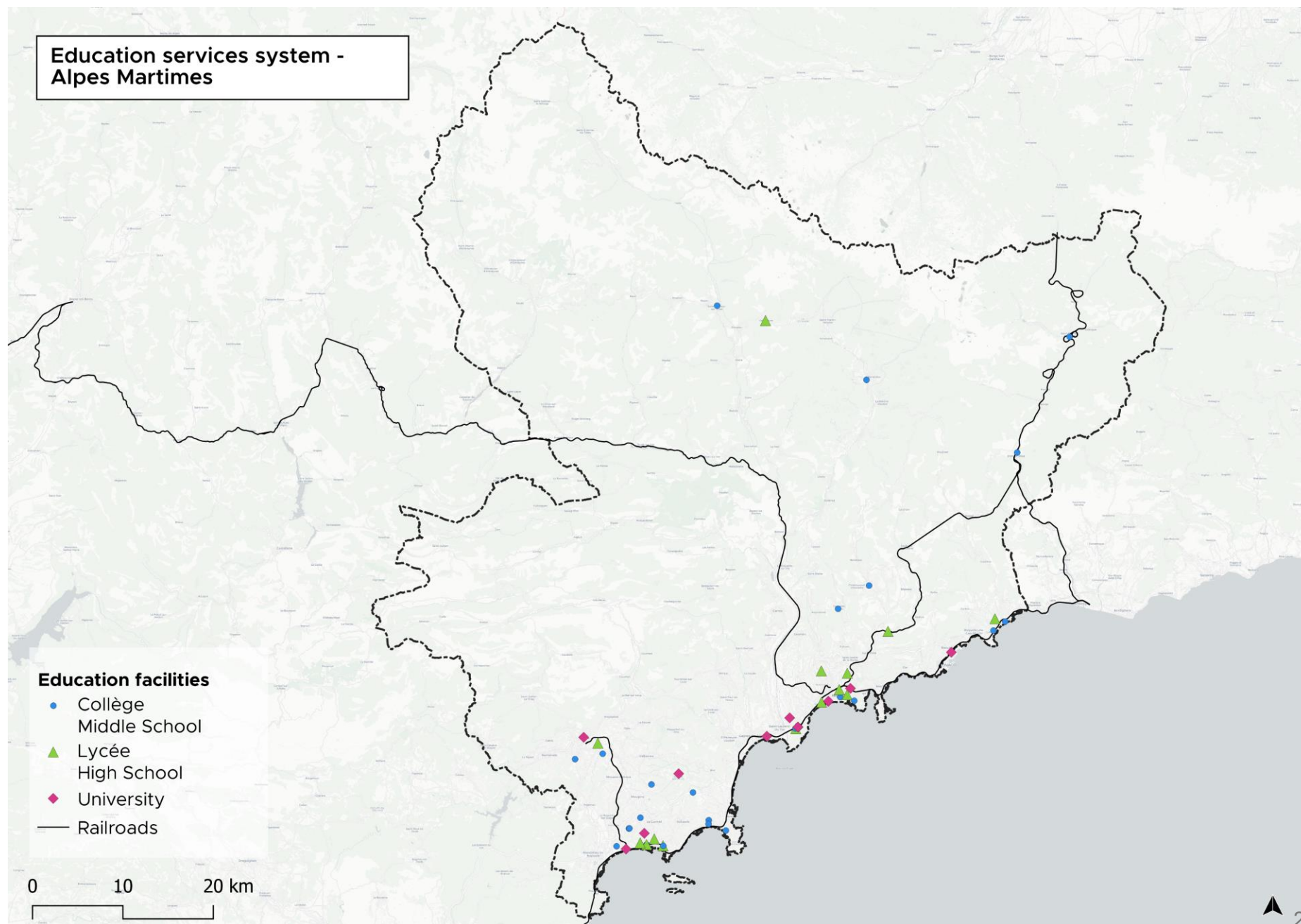
Territory composition : Land Use

- Extended rural areas



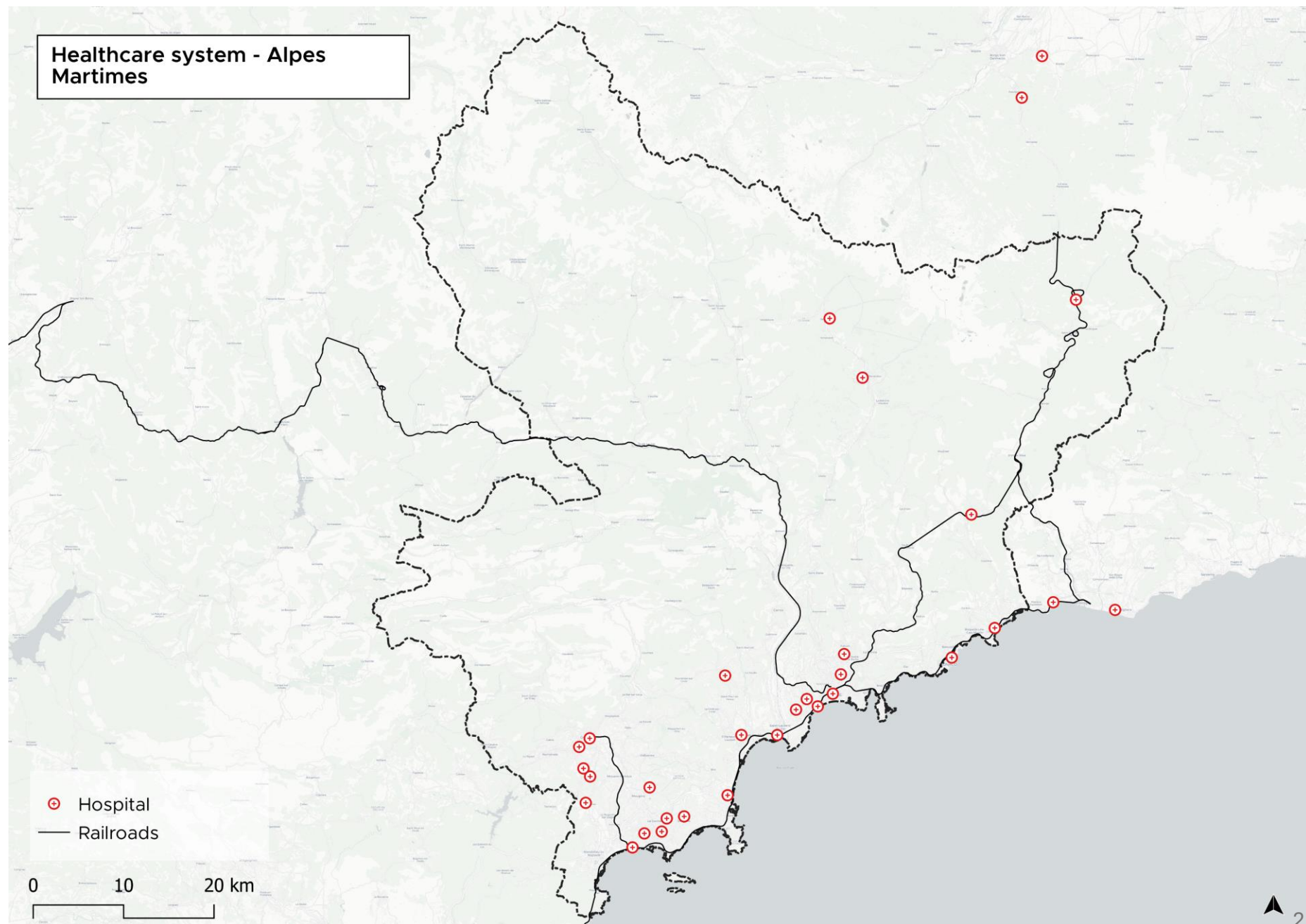
Amenities : schools

- A few schools are located in the hinterland valleys
- Important High-School is located right by the train station in Drap
- Most of the education facilities are located by the coast
- All the universities are located around Nice and especially the big campus Sophia-Antipolis ; one campus in Menton as well



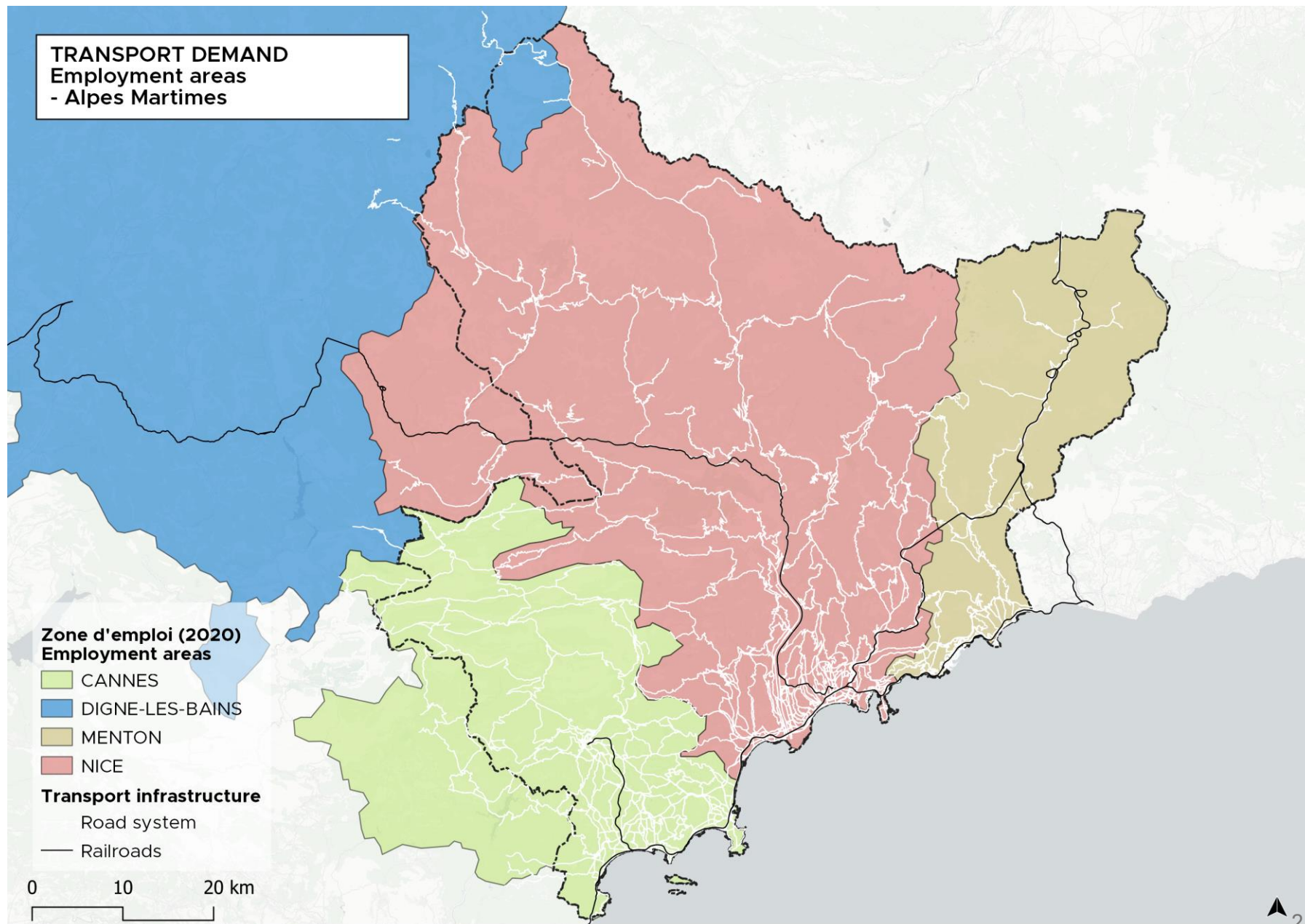
Amenities : healthcare

- Hospitals are mostly located by the coast
- Smaller cities have hospital such as Tende
this is a quite important place when it comes to jobs

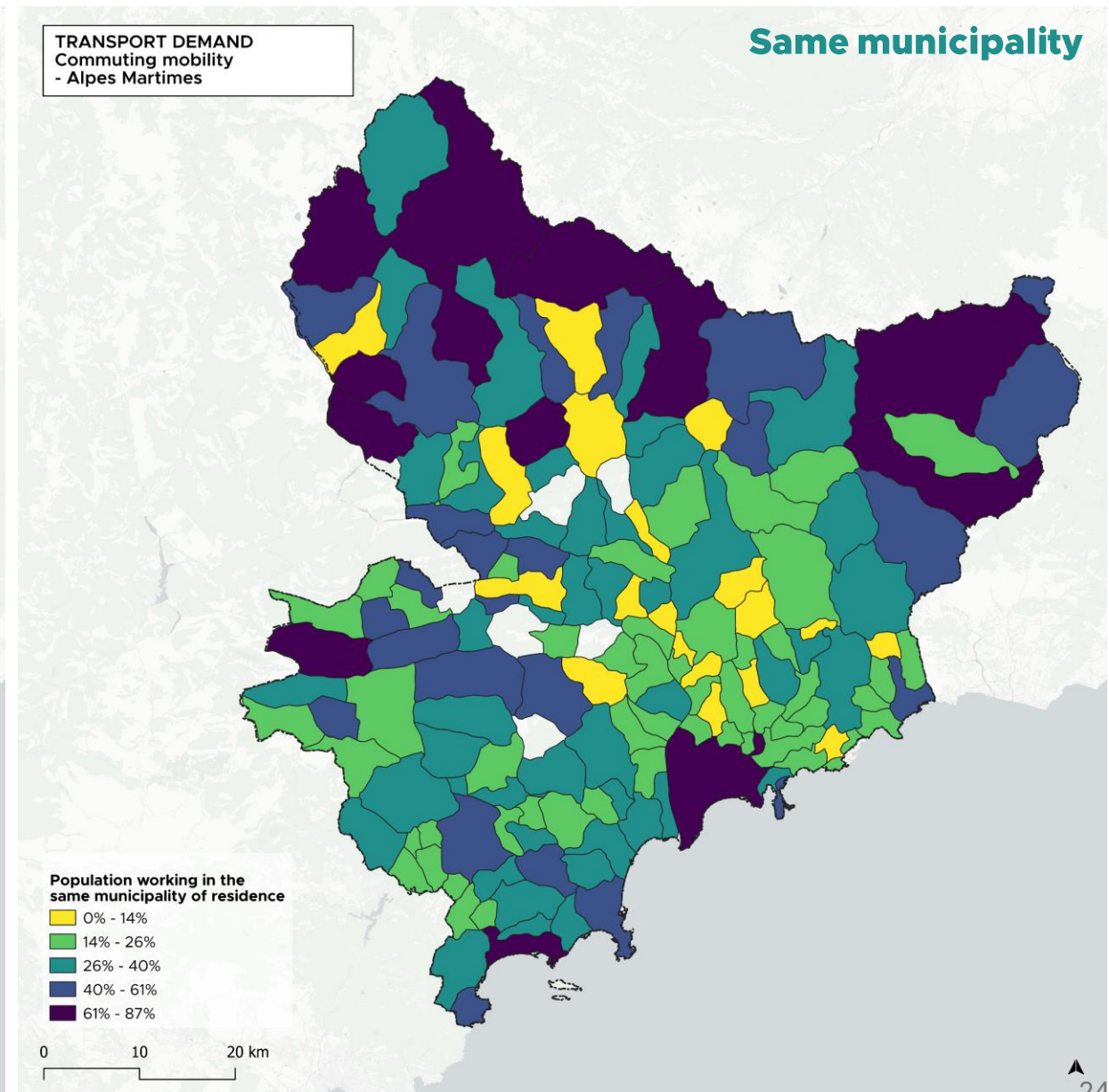
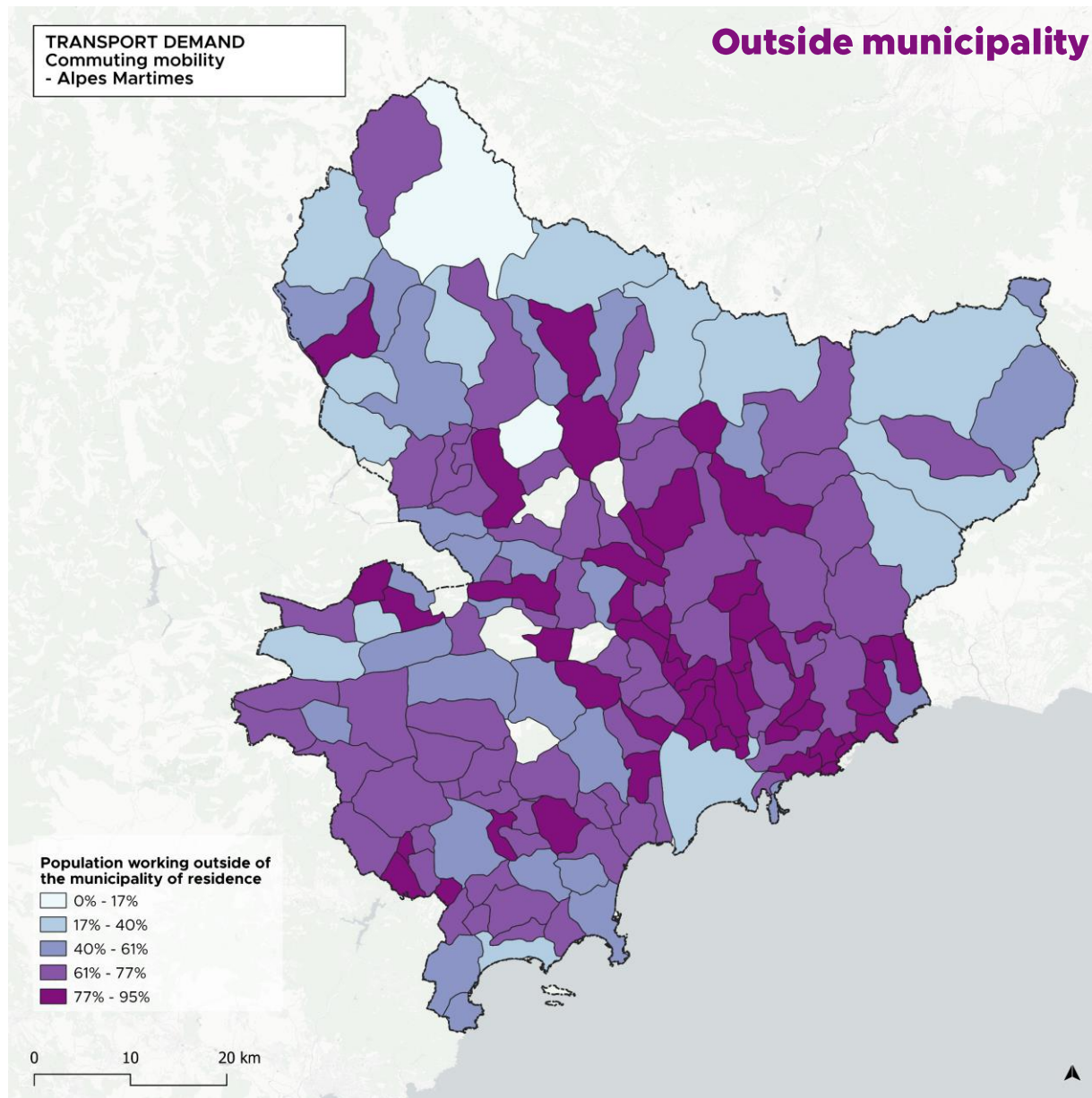


Territory structure : Employment Areas

- Employment zone : geographical area in which most of the working population lives and works, and in which establishments can find most of the labour needed to fill the jobs on offer
- Influence area going further than the department, in the neighboring ones : Var and Alpes-de-Haute-Provence

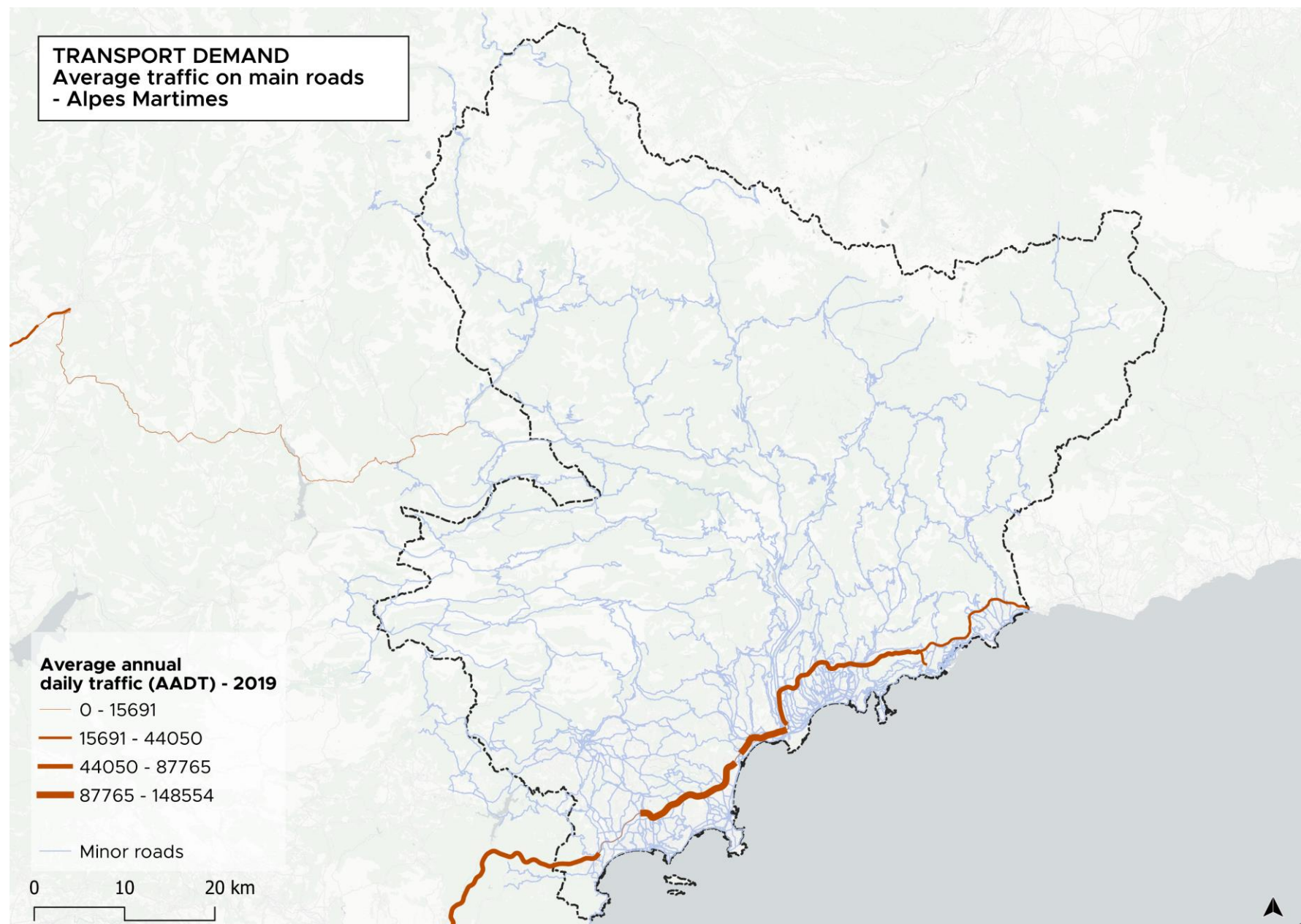


Commuting : In or out ?



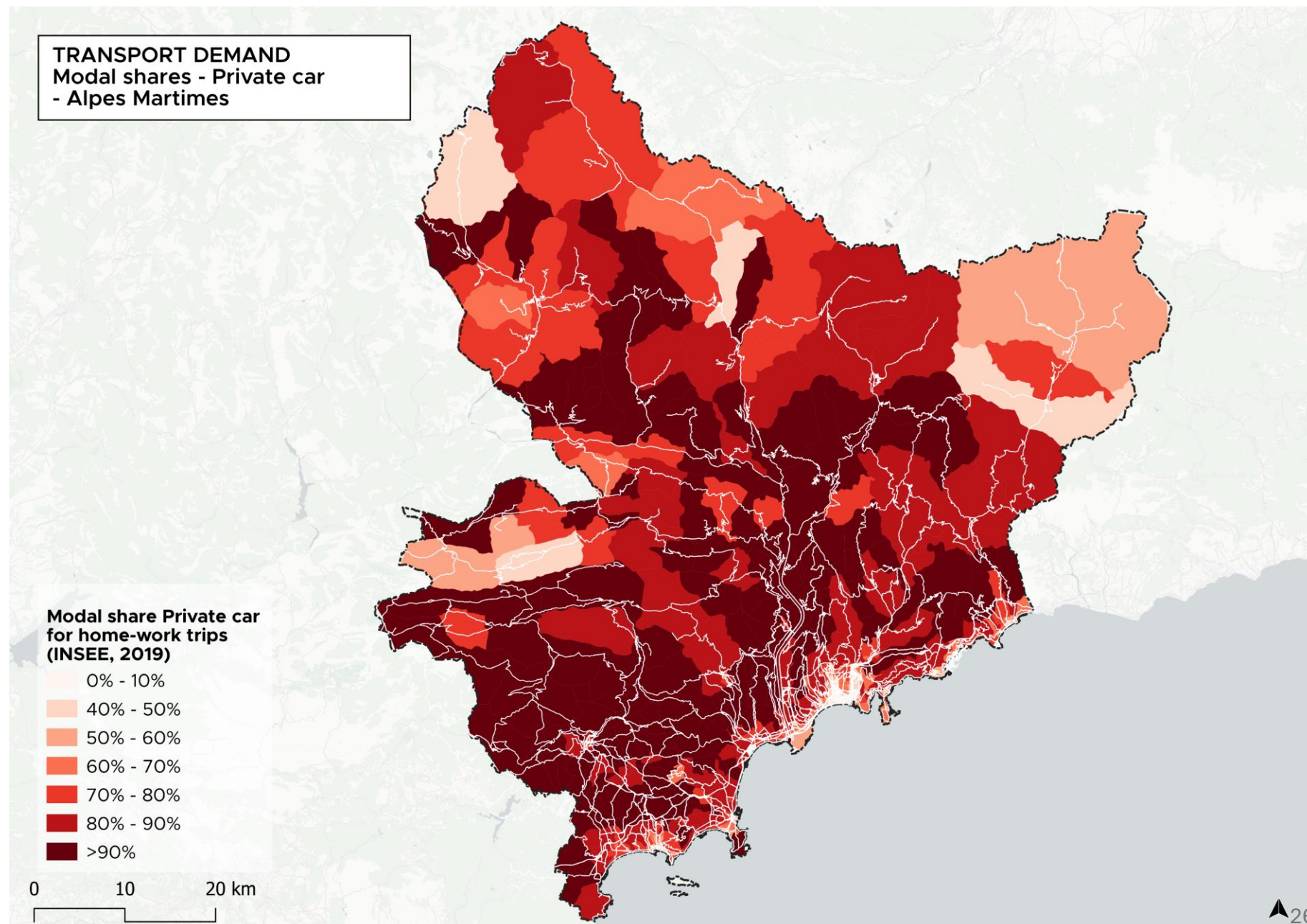
Road Transport : Average traffic

- Average annual daily traffic on « Routes Nationales », main roads, managed by the state
- Only along the coast
- Minor roads in the hinterland and valleys



Road Transport : Commuting by car

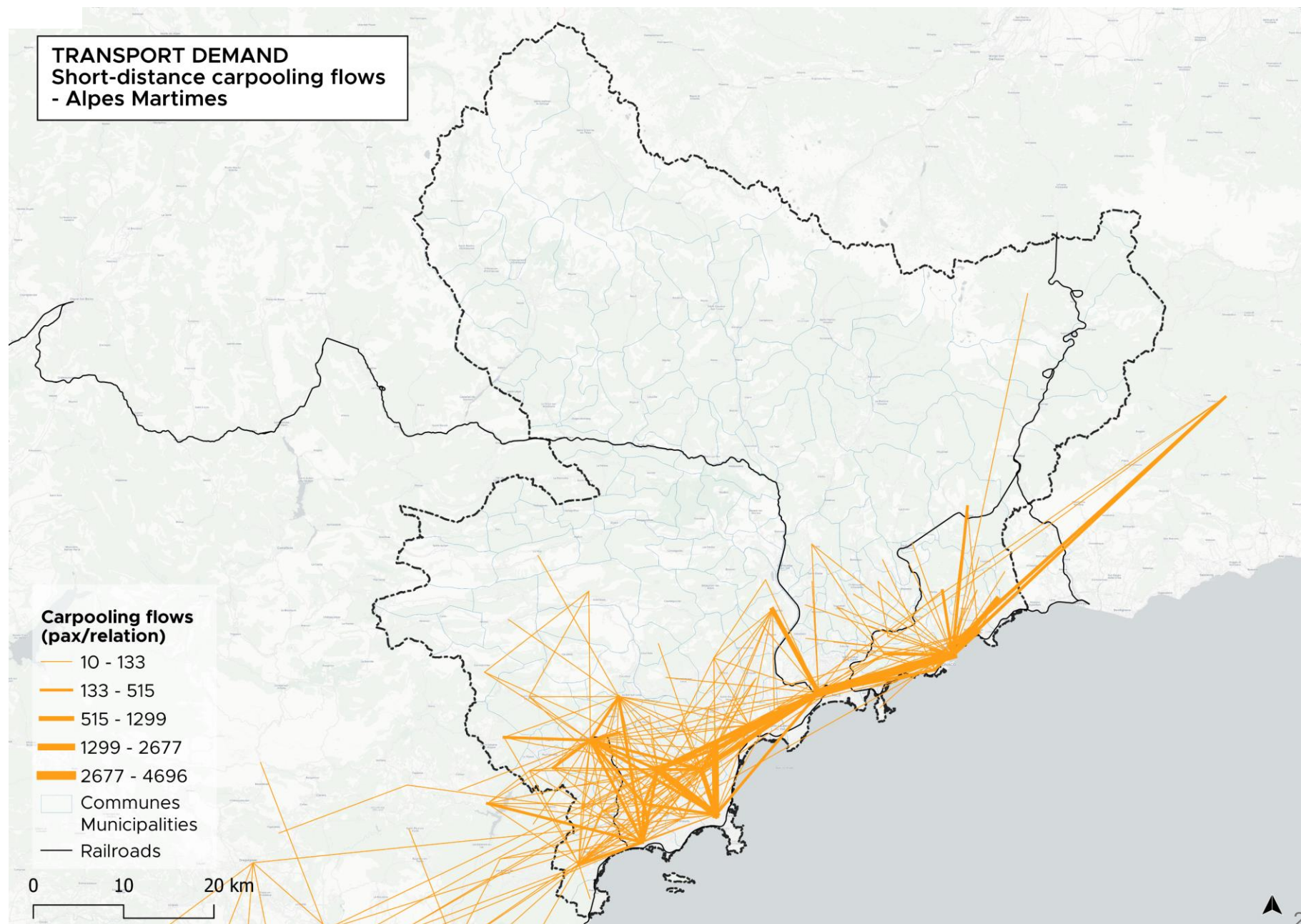
- High rate of car commuting in the « Moyen-Pays » (Medium Valley), households in the suburbs of large centralities
- « Haut-Pays » is relying less on car



Road Transport :

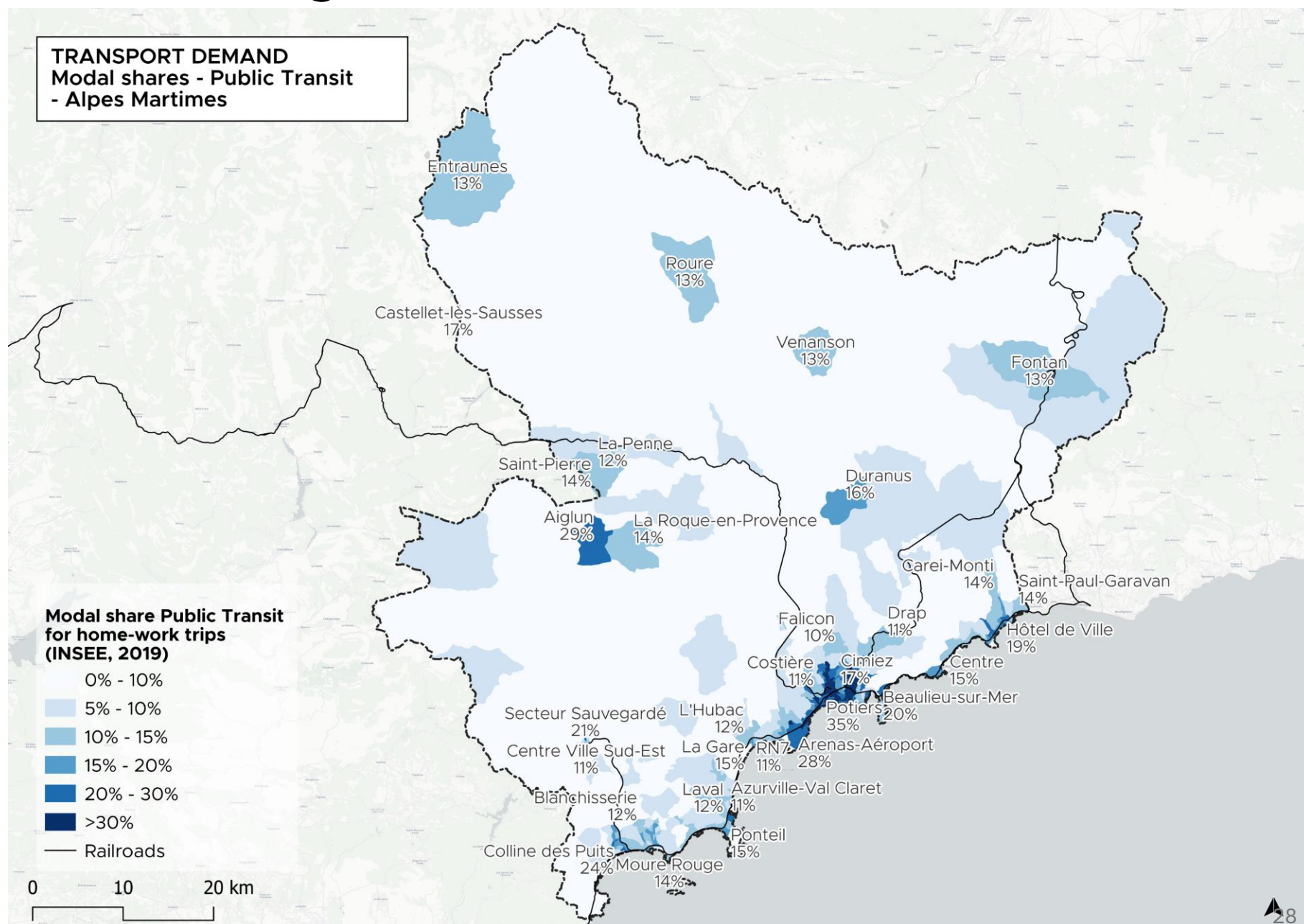
Carpooling

- Carpooling flows are located around the biggest cities
- Monaco attracts the major carpooling flows
- Few crossborder flows to Italy connecting mainly to Monaco
- Close hinterland is well connected by carpooling to the cities such as Nice, Cannes and Antibes



Public Transport : Commuting to work

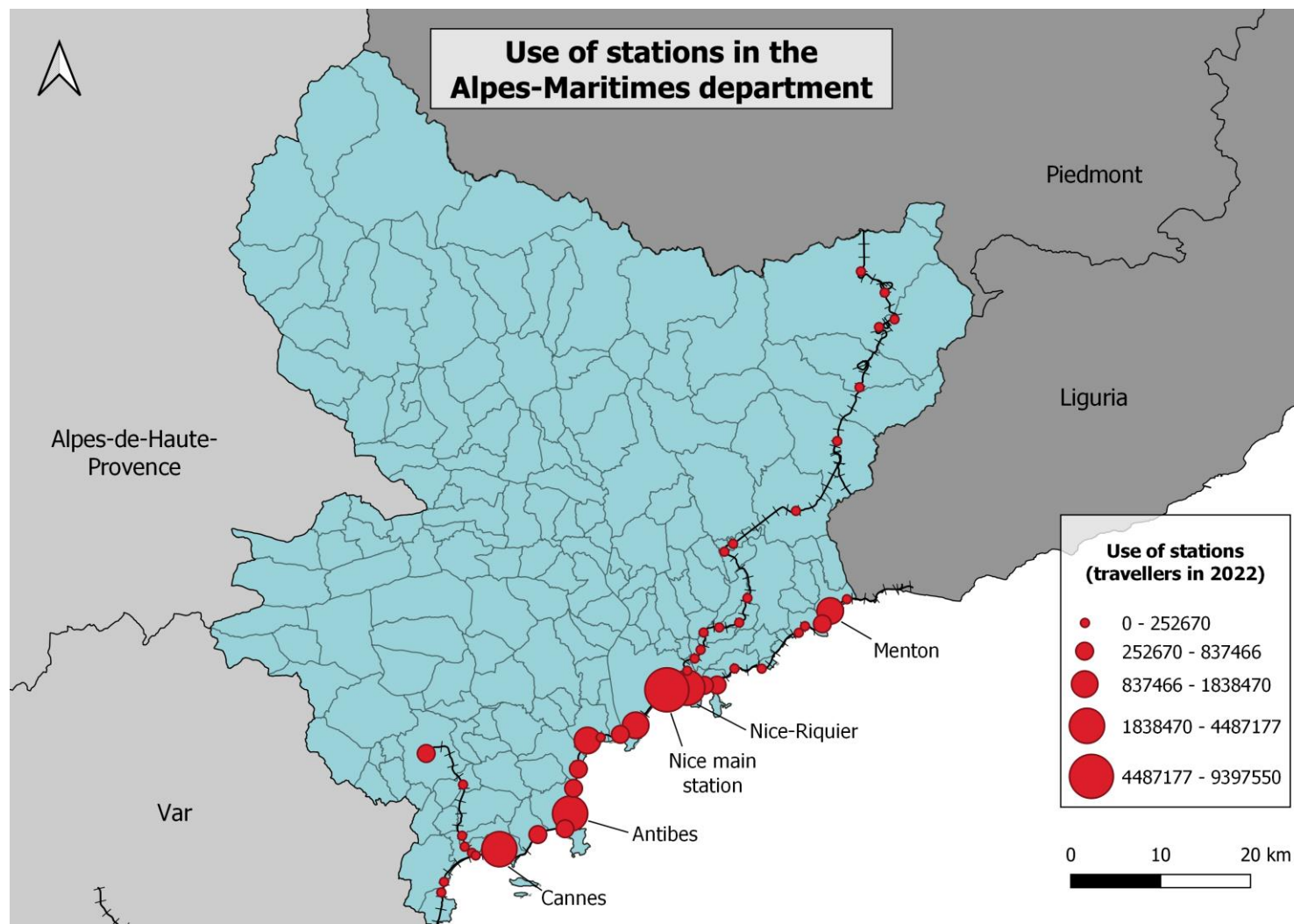
- Mostly usage in the immediate Nice surroundings
- PT commuters also present in Menton



Public Transport : Stations usage

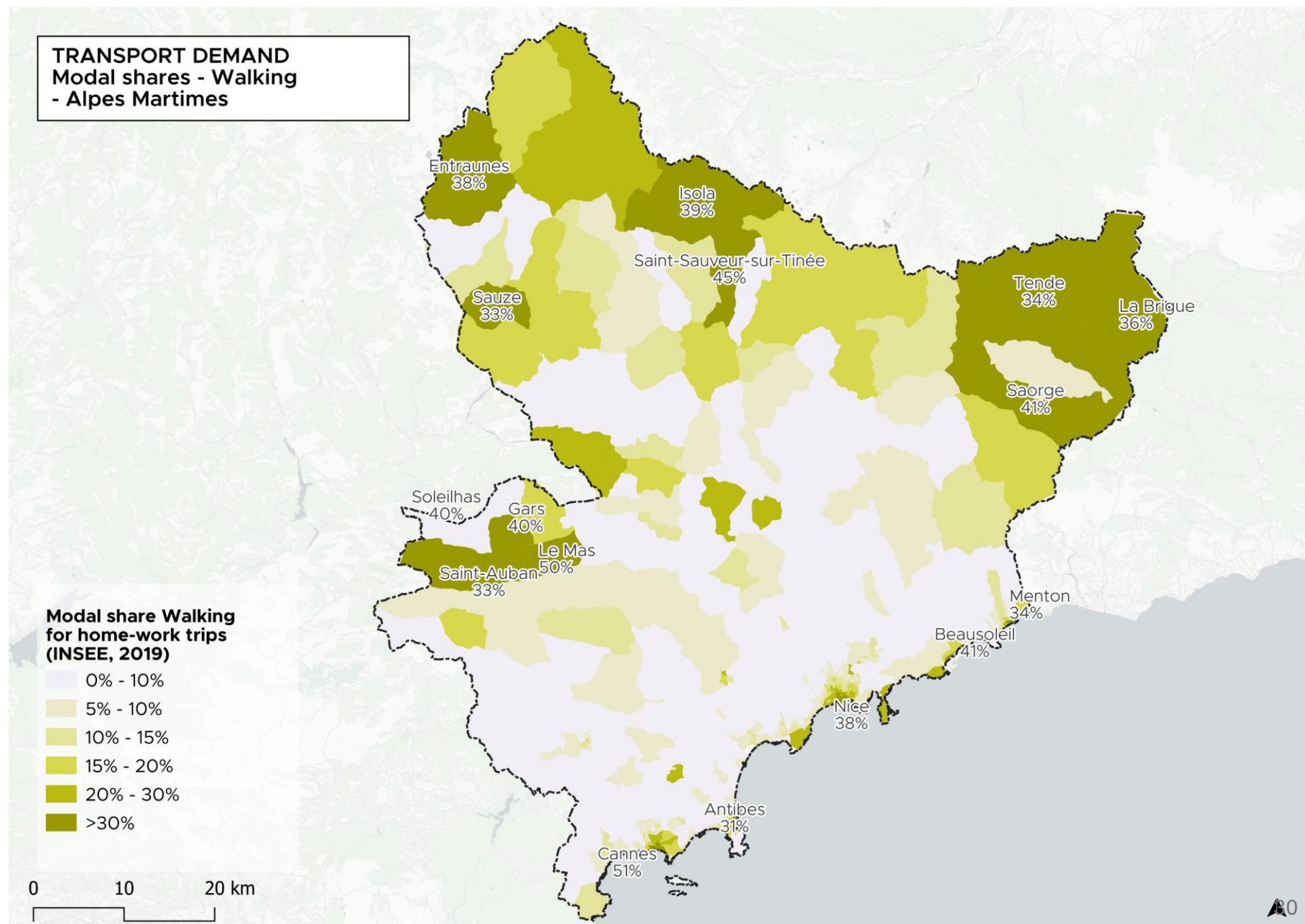
- Busiest stations in the Alpes-Maritimes are located by the sea and in the most populated cities
- Nice main station, is the busiest station with more than 9.3 millions passengers in 2022
- Nice Riquier and Nice Saint-Augustin are two other important stations in the city of Nice
- Cannes, Antibes and Menton are three other main stations in the area
- Monaco station welcomed more than 6.5 millions passengers in 2022

Source : SNCF OpenData

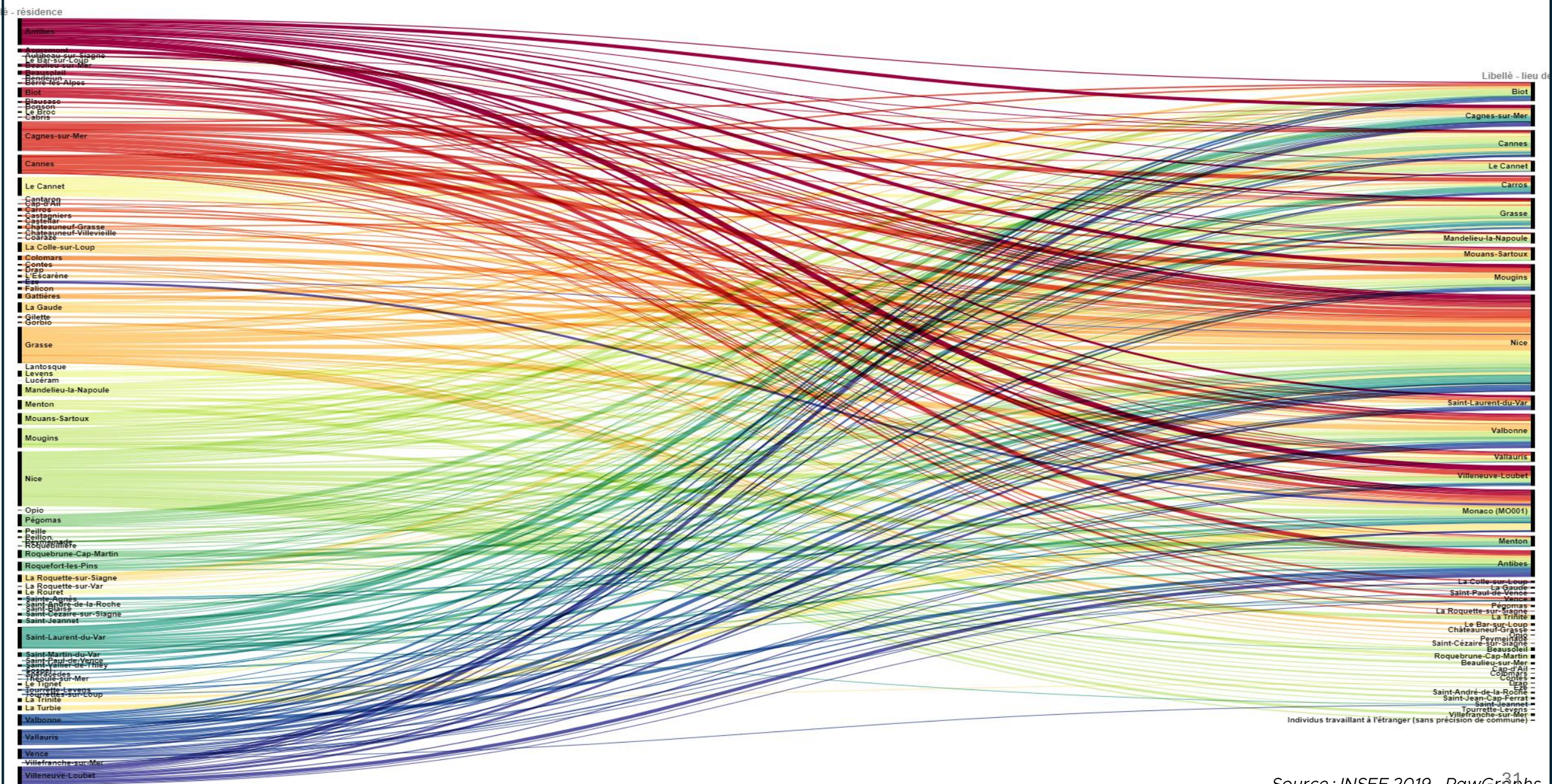


Walking : Commuting to work

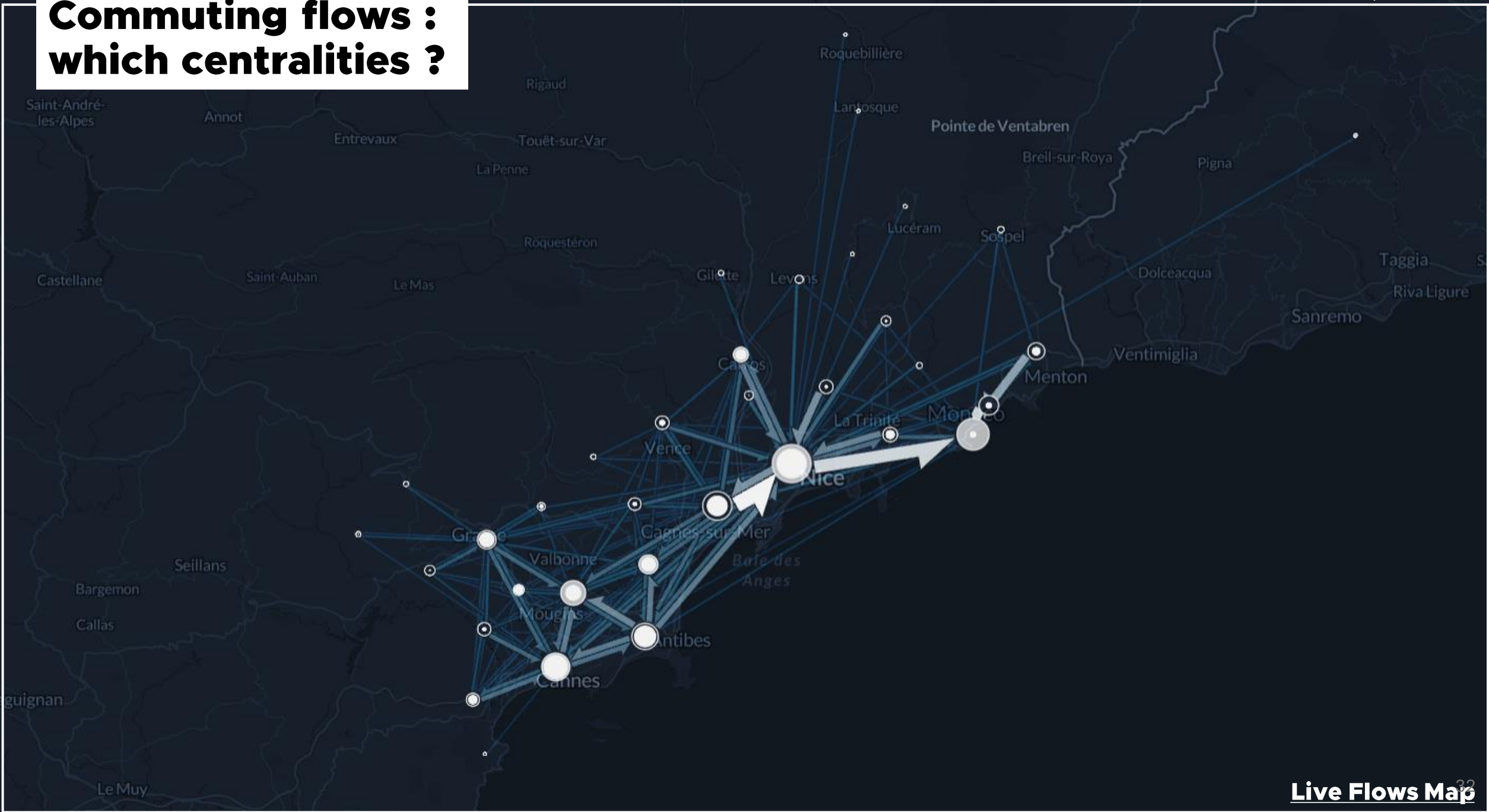
- « Haut-Pays » dynamics relate to a more local scale : higher share of walking commuters
- Urban centers population also commute by walking
- Territories in between, Moyen-Pays, walking commuting does not exist



Commuting flows



Commuting flows : which centralities ?



Criticalities

- Two main attractors in the region :
Nice & Monaco
 - Main transport infrastructures located on the coast
- Poor connections between coast & hinterland
 - Regional railroads are lacking maintenance
- Very dense mobility area : back and forth around the border
 - Highly negative impact of mobilities to Monaco (car usage)
- Poor international relations to Italy
 - Few options for intermodality services

Opportunities

- Geography matters !
Train des Merveilles is located in Roya Valley -> all flows are concentrated
 - Mountain villages included in their own ecosystem : commuting by walking
- A lot of train riders are commuters to work
 - Very attractive touristic region
- Congestion situations around cities and the valley gives pertinence to the train

Project

*A train for the territory
and everybody :
workers, students,
international workers*

**Train
des
Merveilles**

Train des Merveilles :

Introduction

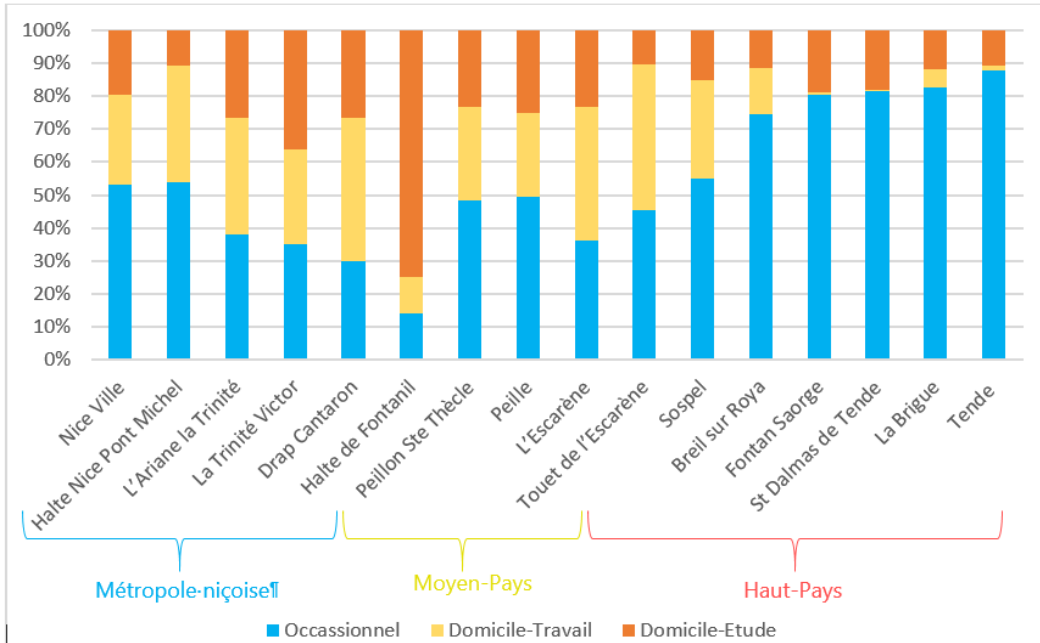
- For more than 100 years, this train line links Nice, the capital city of the French Riviera, with its hinterland and the towns of Breil-sur-Roya and Tende.
- Between the Mediterranean sea and the mountains, from sea level to 1 000 meters high and over 100 kilometres, this line is very touristic and famous.
- The Roya Valley and the Merveilles line have seen a turbulent history between the various nations that have possessed them (Kingdom of Sardinia, France, Italy).
- The line was destroyed during the Second World War to restrict supplies to German troops and has only been reopened since 1979.



Train des Merveilles : Stations entries

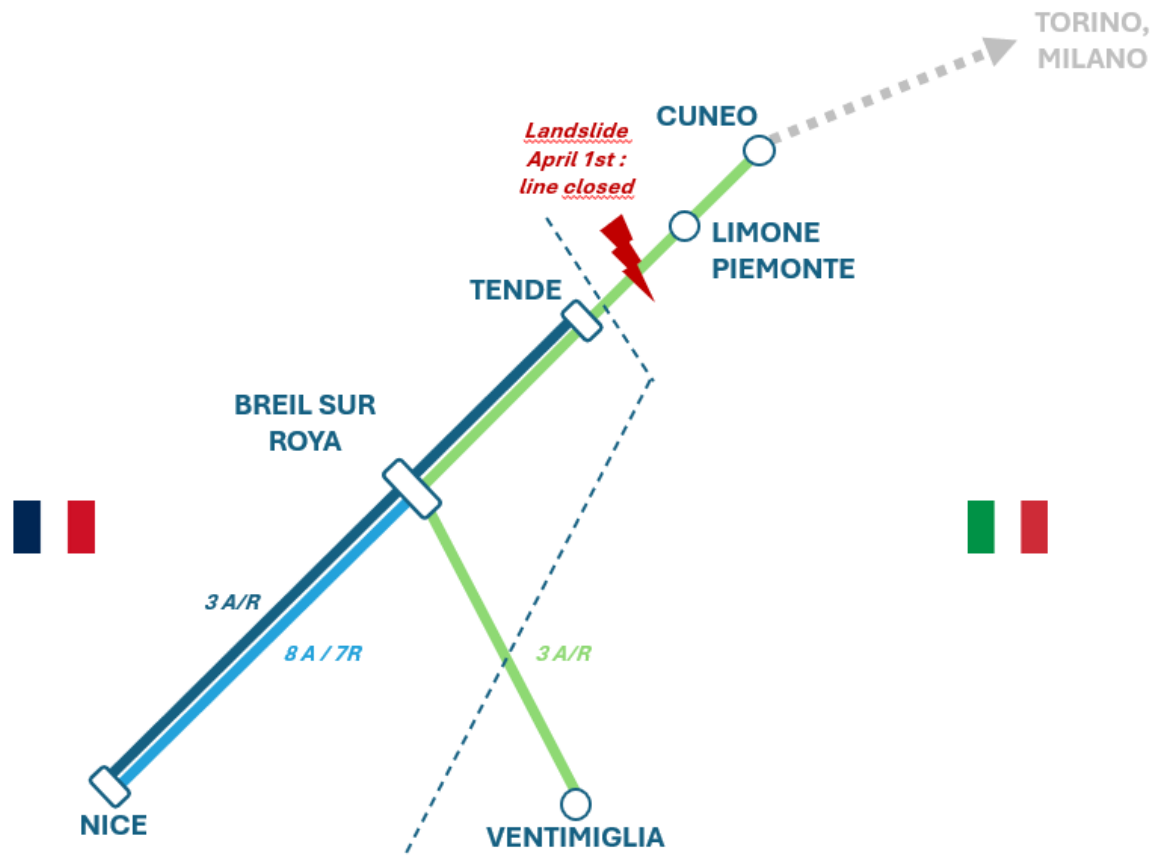
- Most important stations on the Merveilles line are located around Nice and its suburbs (different stations in Nice, Drap-Cantaron, Fontanil, etc.)
- High-School in Drap-Cantaron very attractive
- 270 000 passengers on Nice – Tende line in 2019

% motifs par gare de la ligne Nice-Tende

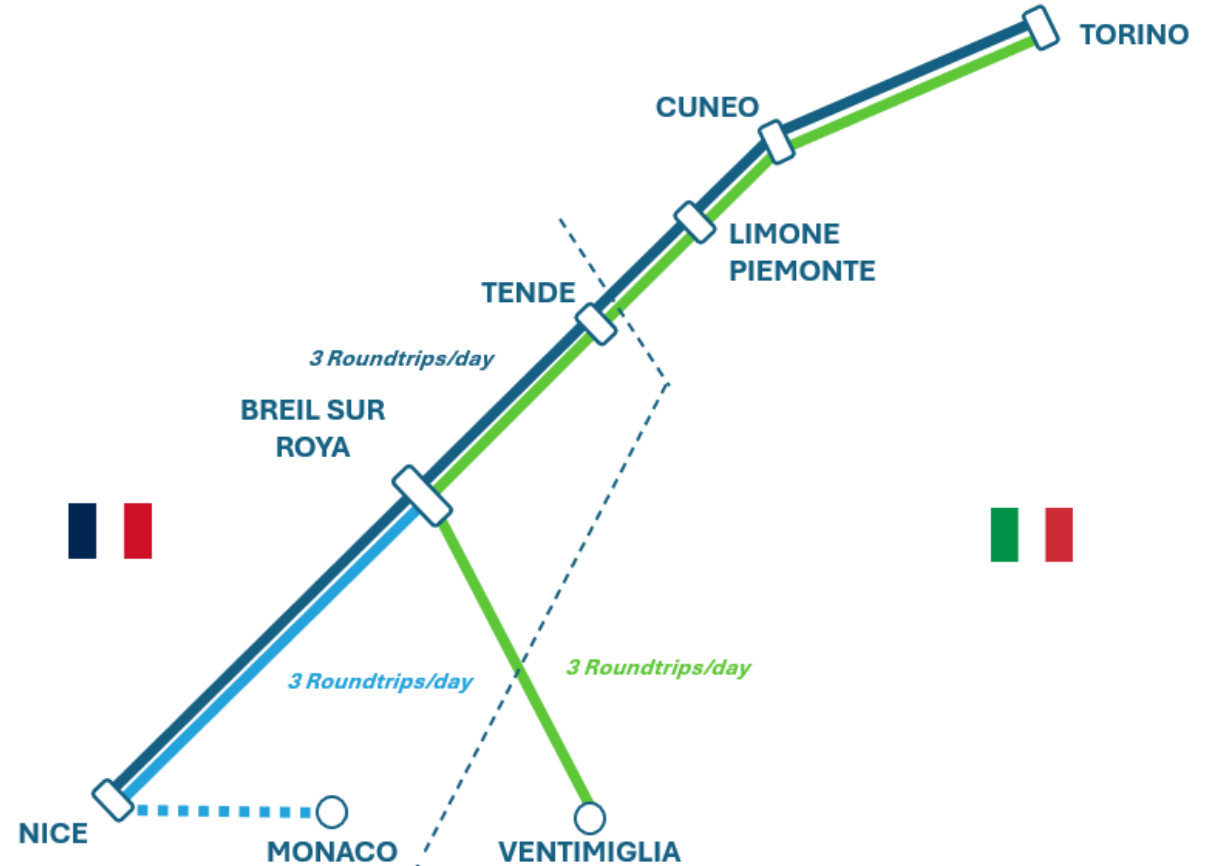


Train des Merveilles : Service development

Actual state



Project



3 A/R direct roundtrips Nice-Torino
3 A/R direct roundtrips Ventimiglia-Torino
3 A/R extra shuttles Nice-Breil sur Roya

Train des Merveilles : International routes

- New direct routes from Nice to Torino
- Better changing times in Breil and Tenda

TO DO

- Renewal of the 1970 Convention (distribution of maintenance costs)
- Complete renewal of the line with complete replacement of the fitting-out
- Restoration of the maximum line speed (80 km/h)
- Creation of a unified tariff (wonder fare)
- Purchase of new rolling stock suitable for international service
- Financing with the national and EU funds

The need for a new **rolling stock**

- Bi-mode (electricity & diesel)
- Double signaling system (FR & IT)



Example : BTR 813 – Val d'Aosta

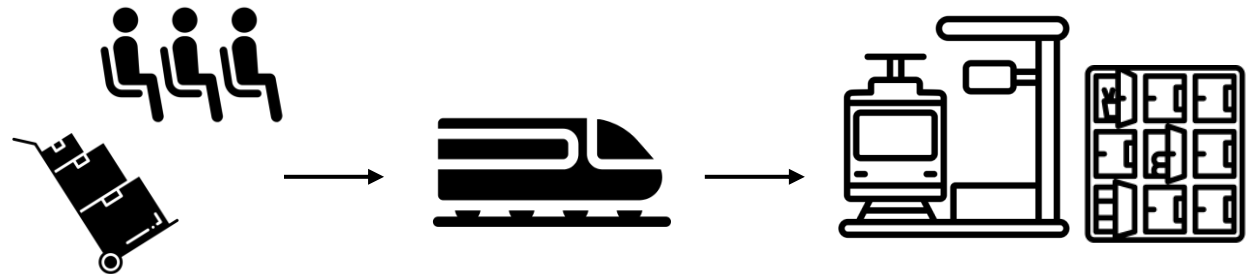
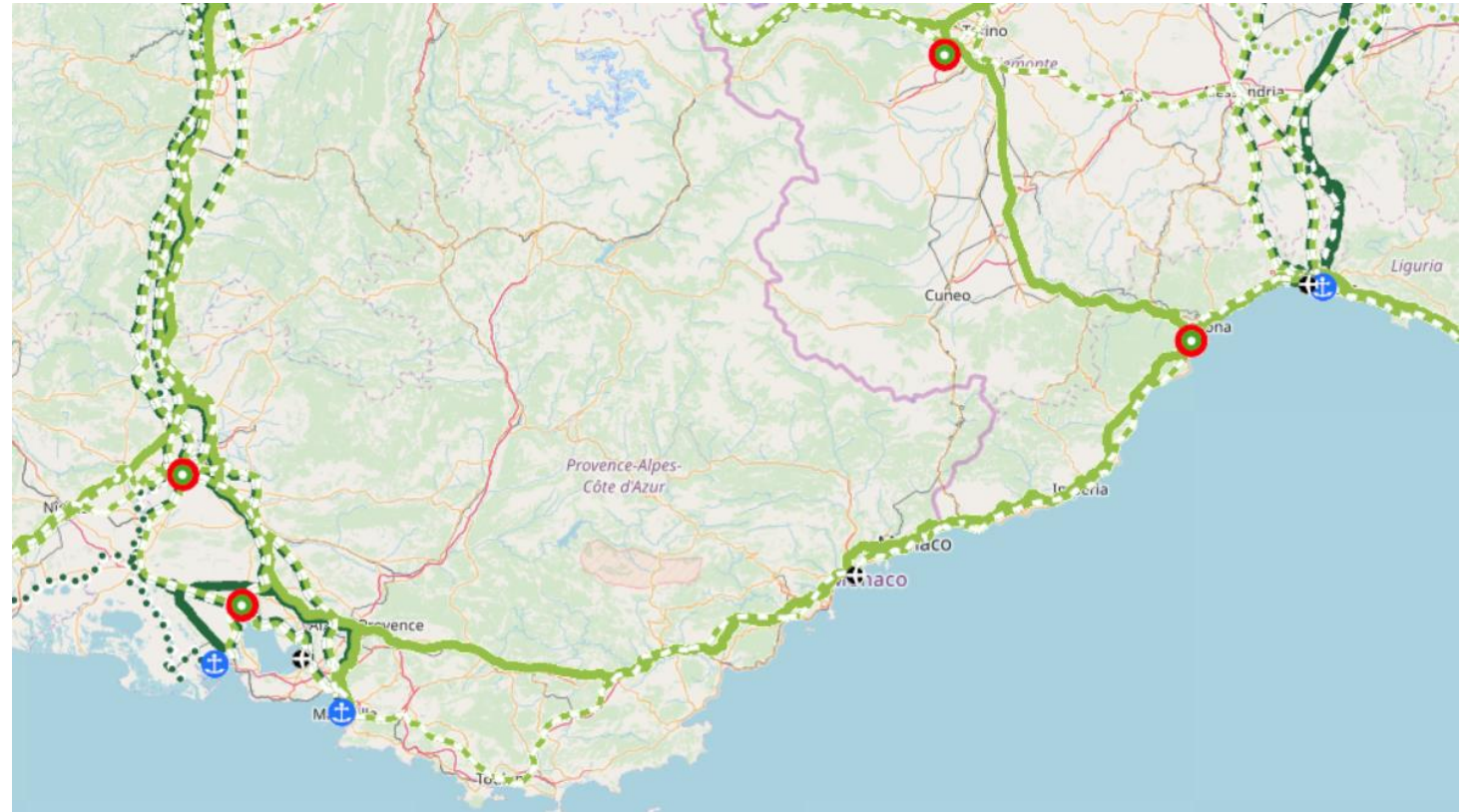
Train des Merveilles : Service development

<i>Train Station</i>	<i>Trenitalia 2</i>	<i>TER 2</i>	<i>TER 5</i>	<i>Trenitalia 3</i>	<i>TER 6</i>	<i>TER 7</i>	<i>TER 10</i>	<i>Trenitalia 6</i>	<i>TER 12</i>
Nice-Ville		07:30	09:15		10:00	11:53	14:51		19:45
Ventimiglia	06:18			10:39				18:49	
Breil-sur-Roya	06:55	08:45	10:27	11:17	11:19	13:08	16:06	19:25	20:50
Tende	07:46		11:33	12:19		14:13	17:10	20:16	
Cuneo	09:19		12:33	13:19		15:15	18:10	21:19	
Carmagnola	10:12		13:26	14:12		16:08	19:03	22:12	
Torino Porta Nuova	10:37		13:51	14:37		16:33	19:28	22:37	

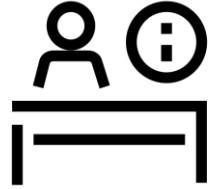
<i>Train Station</i>	<i>Trenitalia 1</i>	<i>TER 1</i>	<i>TER 4</i>	<i>TER 3</i>	<i>TER 8</i>	<i>Trenitalia 4</i>	<i>TER 9</i>	<i>Trenitalia 5</i>	<i>TER 11</i>
Torino Porta Nuova	05:33			09:05	12:04	13:09	14:46	15:49	
Carmagnola	05:55			09:27	12:26	14:02	15:08	16:11	
Cuneo	06:48			10:20	13:19	15:10	16:01	17:04	
Tende	07:56			11:28	14:27	16:02	17:09	18:12	
Breil-sur-Roya	08:48	07:04	09:10	12:20	15:19	16:42	18:01	19:04	17:20
Ventimiglia	09:28					17:49		19:44	
Nice-Ville		08:11	10:17	13:27	16:26		19:08		18:27

Train des Merveilles : Freight Transport

- Low demand => integrate multiple uses to try to reach sustainability
- To make trains more profitable, it is possible to add freight on the passengers trains
 - CARGO INTEGRATION
- Charging packages from main European freight corridors



Services offer in the stations



Reception and information areas

Set up a tourist information office with qualified staff to provide information on local attractions, things to do, transport timetables, etc. Brochures, maps and guides can also be made available.

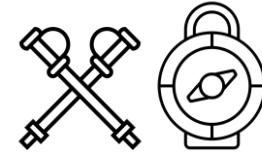
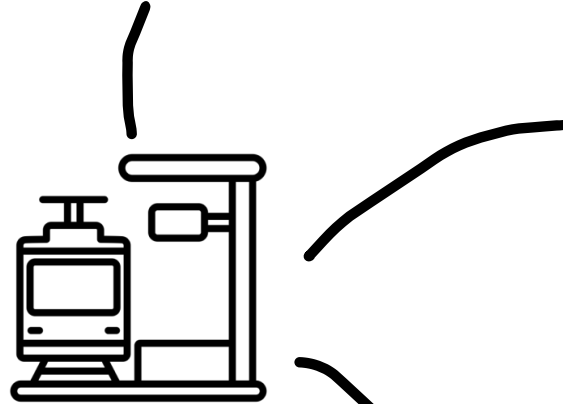


Souvenir and local product shops

Set up shops in the station selling souvenirs typical of the region, such as handicrafts, local culinary specialities, wines and regional products.



Guided tours and excursions Offer guided tours or excursions to popular tourist sites from train stations, allowing travellers to discover the cultural, historical and natural wealth of the Alpes-Maritimes.



Equipment hire services

Offer equipment hire at the station for local activities such as bicycles, hiking equipment, etc.



Entertainment and cultural events:

Organise regular entertainment, shows, craft demonstrations or cultural events in the station to entertain travellers and help them discover the cultural wealth of the region.

Costs & Financing

Financial resources needed

- **Infrastructure development costs:** Creating or adapting spaces for services such as reception, shops, restaurants, information desks, etc. may require significant investment. The cost will depend on the current state of the facilities and the quality standards targeted.
- **Staff costs:** Hiring qualified staff to manage the various services (tourist information, rentals, catering, entertainment, etc.) represents a significant proportion of expenditure. Salaries, training and social security contributions need to be taken into account.
- **Cost of equipment and partnerships:** For equipment hire services, souvenir shops and catering services, investment will be needed to purchase or hire equipment and products, and possibly to establish partnerships with local service providers.

Costs estimation

- **Cost of communication campaigns:** To promote these new services and attract visitors, communication and marketing campaigns will be necessary. This may include the creation of communication materials (brochures, websites, mobile applications), advertising campaigns, launch events, etc.
- **Funding and stakeholders:** Funding for these initiatives can come from a variety of sources, such as local authorities (municipalities, regions), rail operators, public-private partnerships, or even European grants or funds for tourism development projects.

Service development : bikes rental

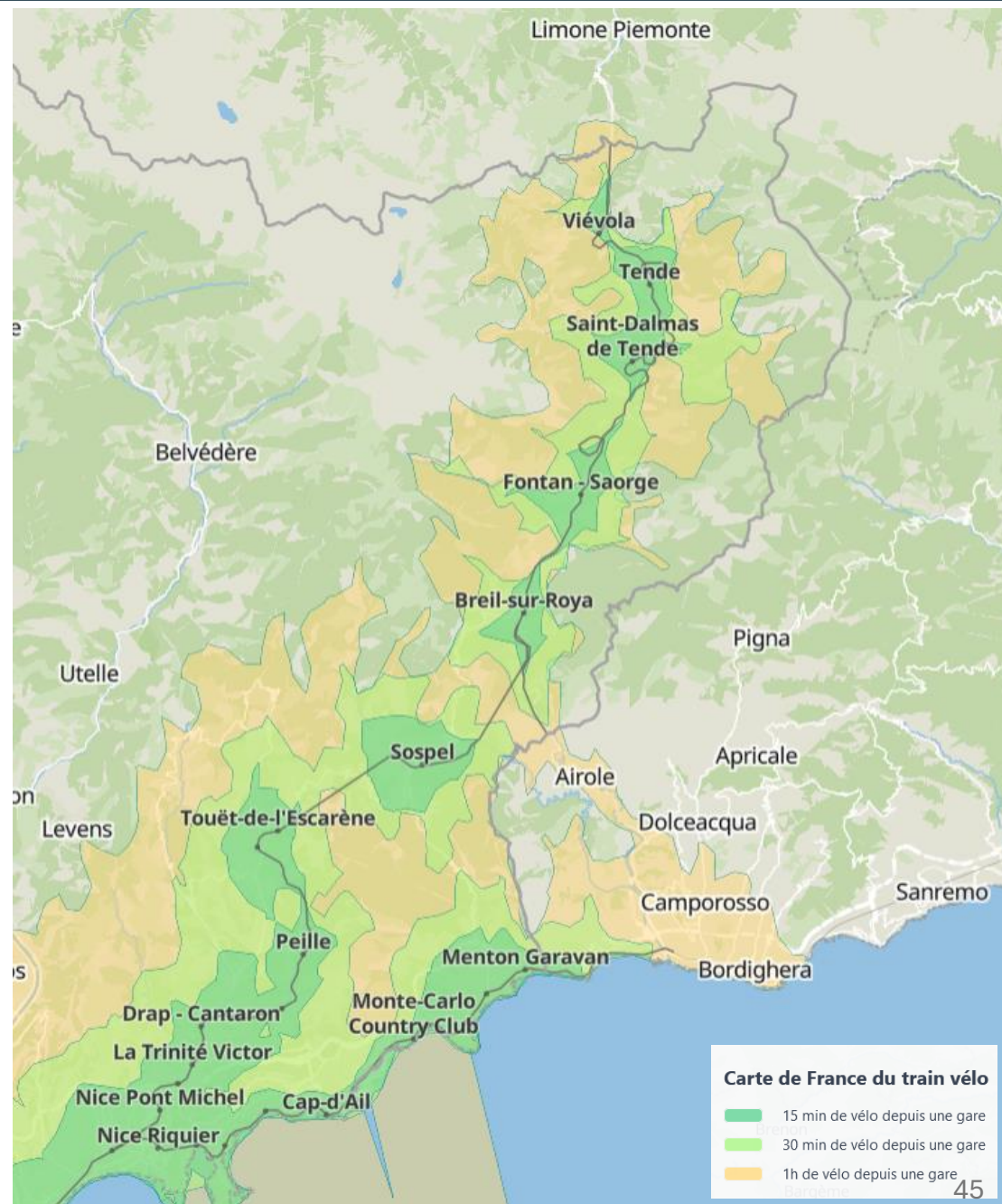
Train station



Train commuters
using bike for first
kilometer : safe
parking spots at the
station



Cyclo-tourists : renting
bikes from the station
to have a day around,
and give it back in
another station



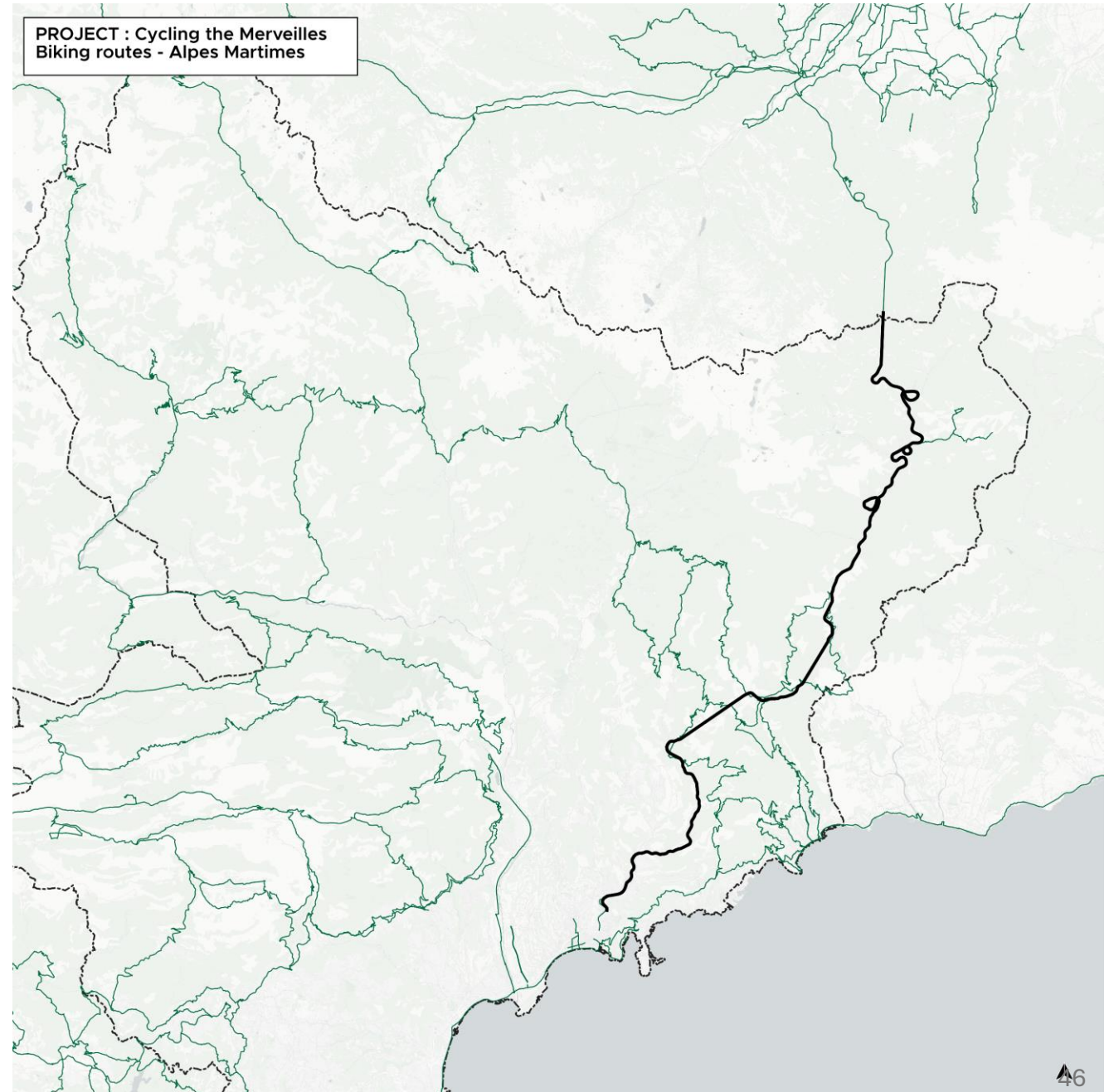
Service development : bikes rental



- For locals, possibility to leave the bike in the morning at the station, to take it back in the evening and go home
- Cooperation with inter-communalities to financially help inhabitants to buy some bikes and e-bikes in order to substitute the car to go to the station (especially for home/work daily commutes as well as leisure commutes)



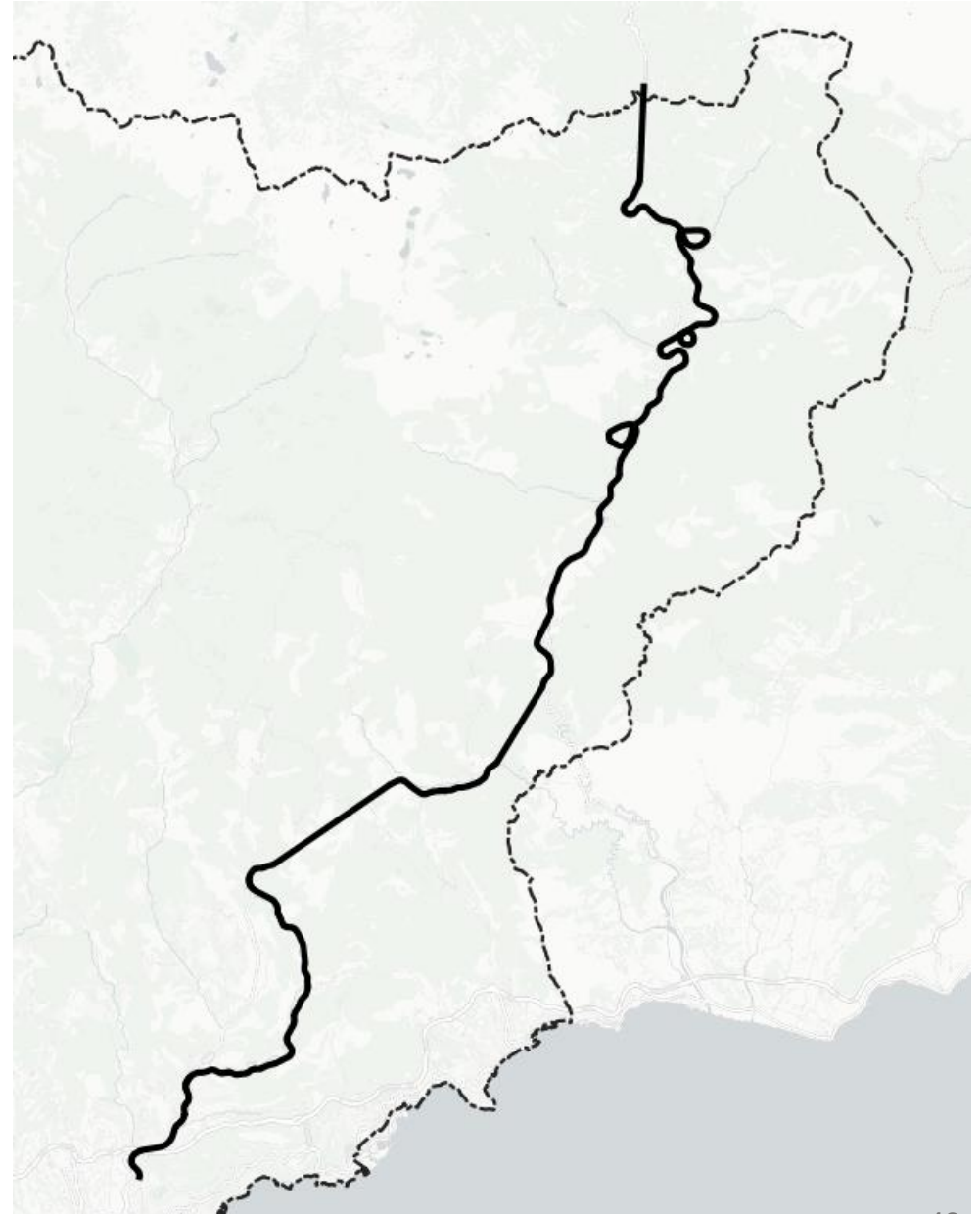
- Many itineraries available departing from train line : opportunity for train users into bike riders
- Going downhill with the bike : the train can serve to come back up



New offer : Touristic train

The concept

- Touristic line during the touristic season between Nice and Cuneo with historic rolling stock
- Calendar :
 - From 02 June to 29 September 2024: every Sunday
 - From 07 July to 30 August 2024: every Wednesday, Friday and Sunday
- Day trip from Nice to Cuneo
- Program:
 - 8:30 : departure from Nice
 - 12:00 : arrival in Cuneo
 - Lunch and break time
 - 14:30 to 16:30 : visit of Cuneo with a wonderful guide
 - 17:00 : departure from Cuneo, dinner in the train
 - 20:30 : arrival in Nice



Touristic train : Marketing strategy

The fare offer

- Basic fare offers (mandatory):
 - 29€ per person for the seat, the guide comments and one drink
 - Discounts for families : 25€ per adult and 15€ per child
 - Discounts for groups : 25€ per person in groups of 10, 20€ per person in groups of 15+
- Options (to add to the basic offer):
 - Possibility to eat in a selected italian restaurant in Cuneo (from 15€ and up to 50€)
 - Possibility to pay for dinner (between 20 and 40€ per meal)
 - Possibility to upgrade for a premium seat (better view, better seats, internet connection and electricity plugs)
 - 20% discounts for groups between 4 and 10, 30% for groups between 10 and 20, 40% discounts for groups of 20+



FROM NICE TO CUNEO,
EXPLORE THE HINTERLAND

LINE OF WONDERS

Incredible views from an old train over the mountain and the Roya Valley

BOOK NOW

From 29€ per person

www.train-des-merveilles.com

Promotional flyer of services offered at the stations

TRAIN DES MERVEILLES

From Nice to Tende

Recognized for the wild beauty of its landscapes, the Train des Merveilles has developed to make some of its stations very touristy and busy

THE EXTRAORDINARY TRIP

From Nice to Tende, the Merveilles tourist train travels through sumptuous coastal landscape. Mediterranean at Mercantour National Park. This comfortable, air-conditioned train serves the villages of the Paillon and Roya-Bévéra valleys, discovering unique panoramas of the hinterland. The route of the Train des Merveilles is recognized as one of the most astonishing railway landscapes of Europe. In summer, a regional guide comments on your itinerary and tells about this heritage natural and historic in every way exceptional.

HISTORY OF AN EXCEPTIONAL CONSTRUCTION

From sea level to 1000 m altitude, the line railway line of around a hundred kilometers inaugurated in 1928 is a monumental work which counts numerous works of art. The construction initiated in 1883 is a real technical challenge which required no less than a hundred bridges and viaducts and almost as many tunnels and walls support to navigate these rugged terrain.

DARE TO UNUSUAL GETAWAYS!

On sunny days, take the Train of Wonders and set off to discover authentic villages. Each of the ten stops on the line deploys its attractions: hiking trails, museums, monuments, local crafts, etc. Arrived in Tende, the park gates national park of Mercantour open onto a natural preserved, 600 km of marked trails and its treasures archaeological rock art.

USEFUL INFORMATION

Schedules

A regular line, this train serves twelve stations and railway stops daily on eleven round trips between Nice and Breil-sur-Roya (including four Nice-Tende). Possible connections with the Nice-Cunéo line. Detailed timetables on timetable no. 5 in stations of the line. Please note: due to modernization works, the train terminus is temporarily carried out at Breil-sur-Roya station from September 3, 2017.

PRICES, RESERVATIONS AND PURCHASE OF TICKETS
Online store on the TER PACA site, SNCF stations in the Alpes-Maritimes and regional SNCF ticket distributors.

SERVICES ON BOARD THE TRAIN

- Bicycles are accepted on board the train.
- Pets accepted with a transport ticket.

YOUR CAR-FREE ITINERARY IN ONE CLICK

Free application and website, Pacamobilité.fr calculates all your train, coach, metro, bus and tram journeys in Provence-Alpes-Côte d'Azur.

ZOU! REDUCED RATES FOR YOUR LEISURE!

For 15 euros, ZOU! Pass allows you to travel during an unlimited day throughout the Alpes-Maritimes department. Valid from June 1 to September 30. Already have a ZOU! card? Studies or ZOU! 50-75%? You benefit automatically 50% reduction for your leisure transport, find out!



Reception and information areas:

Set up a tourist information office with qualified staff to provide information on local attractions, things to do, transport timetables, etc. Brochures, maps and guides can also be made available.



Guided tours and excursions:

Offer guided tours or excursions to popular tourist sites from train stations, allowing travellers to discover the cultural, historical and natural wealth of the Alpes-Maritimes.



Equipment hire services:

Offer equipment hire at the station for local activities such as bicycles, hiking equipment, etc.



Eating and relaxation areas:

Provide cafés, restaurants or fast-food outlets featuring local cuisine in the station. Comfortable rest areas with benches, tables and green spaces can also be created to allow passengers to relax between their journeys.



Souvenir and local product shops:

Set up shops in the station selling souvenirs typical of the region, such as handicrafts, local culinary specialties, wines and regional products.



Entertainment and cultural events:

Organise regular entertainment, shows, craft demonstrations or cultural events in the station to entertain travellers and help them discover the cultural wealth of the region.

TRAIN DES MERVEILLES



TRAIN DES MERVEILLES



Reduced rates for all

From Nice to Tende

- Free: on-board commentary
- June to September: every day
- May and October: weekends and public holidays



Our region is a marvel. Let's share it!



#frenchmerveilles
www.frenchmerveilles.com



**Lorenzo
FREIRE--STELLA**

lorenzo@freirestella.it

**Rémi
BETAILLE**

Master 1 TTE 2023-204
CY Cergy Paris University,
Faculty of Geography

I
- -
U
- -
A
- -
V



Transport

logistique, mobilités
et aménagement

MATRIS

mobilités aménagement transports risques société

**Doriane
MARTINS-RIBERO**

**Simon
TESSIER**

