



D.2.2.1

*4 VISION STATEMENTS FROM THE 4 PTAS
OF ARTMED WITH INPUT FROM THE AMOD
IMPACT ASSESSMENT TOOL*

**PROVINCE OF BRESCIA
PROVINCE OF MANTOVA**

PP05 – ALOT



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OVERVIEW

Project full title: Planning for autonomous mobility on demand in the Euro-MED area

Project acronym: ArtMED

Programme priority: Greener MED

Specific objective: RSO2.4: Promoting climate change adaptation and disaster risk prevention, resilience, taking into account eco-system based approaches

Project duration: 27 months

Project mission: Promoting green living areas

Project category: Test project (Thematic Project)

Work package: WP2 – Transferring the AMOD impact assessment tool to ArtMED PTAs to plan autonomous mobility on demand

Activity: Act.2.2 – Using the AMOD impact assessment tool to develop the local vision statements for autonomous mobility on demand.

Deliverable: D.2.2.1 – 4 vision statements from the 4 PTAs of ArtMED with input from the AMOD impact assessment tool.

Partner in charge (author): PP05 ALOT

Partners involved: LP Postojna, PP04 TML, PP06 PF

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EXECUTIVE SUMMARY

Through ArtMED project 4 vision statements will be developed by Postojna, TML, PF and ALOT on the potential impact of AMOD for 4 local use cases per PTA. The vision statements will help to generate political interest for further exploring and analyzing the potential impact of autonomous mobility on demand.

PP05 ALOT Vision Statements will be developed for 2 territorial areas of the Lombardy Region:

1. Province of Brescia (BS): Municipality of Monte Isola; Municipality of Collebeato
2. Province of Mantova (MN): Oltrepò Manovano – Destra Secchia; Municipality of Curtatone.



To redefine mobility by providing a transportation solution that is autonomous, safe, eco-friendly, and easily accessible, creating a future where everyone can move freely and without barriers

To generate political interest for further exploring and analysing the potential impact of autonomous mobility on demand AMOD and Demand-responsive transport DRT



1

INTRODUCTION

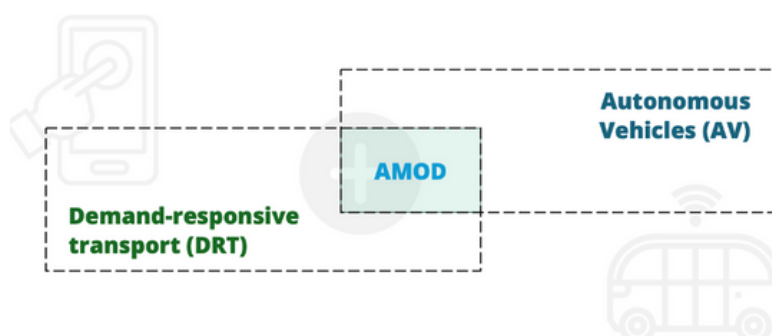
Public transport (PT) accessibility in sparsely populated Euro-MED areas is often poor or non-existent (ESPON Policy Brief, 2020). This leads to 40,6 million people in Euro-MED that are either poorly connected with social networks and basic services (education, medical service, commerce, culture, etc.) or heavily depending on private cars to access them (IEMED, 2021). Reliance on private cars causes significant CO₂ emissions. An example of this private car dependency is seen in the surrounding villages of Postojna, Mali Otok, Veliki Otok, and Stara Vas, which are currently not connected to the urban centre by public transport.

The root cause of the lack or low quality of PT connections in these areas is the high operating costs required to sustain good service frequency and area coverage, given the lack of paying passengers per kilometre. Typically, 85% of bus operators do not break even when offering PT services in these areas (World Economic Forum, 2021).

The AVENUE (H2020) and MultiDEPART (EIT UM) projects successfully developed methodologies to assess local impact of AMOD. Currently, these methodologies cannot easily be applied by PTAs outside of these projects. Therefore, the primary objective of ArtMED is enable PTAs to plan for AMOD by transferring methodologies from École Centrale de Lyon (AVENUE) and CARNET (MultiDEPART) to 4 PTAs in Slovenia (PO), Portugal (TML), Italy (ALOT), Greece (PF) and beyond through jointly optimising and implementing a publicly accessible AMOD impact assessment tool in a transnational approach.

The tool will support PTAs in ArtMED to analyse the potential AMOD impact for local use cases and develop: 4 vision statements (for political support), 4 investment plans (for budgeting) and 2 transport model designs (for planning AMOD systems).

As AMOD hardly exists yet in Euro-MED, ArtMED is the first project to make state-of-the-art insights available to PTAs through a user-friendly tool, that assesses AMOD impact to plan for more accessible, inclusive, and sustainable public transport for people in sparsely populated areas.





Operational barrier and drivers



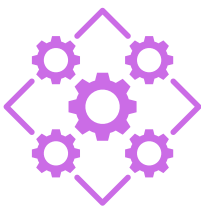
Lack of precise regulation and low progress of EU legislation
Lack of European normalization and standards
Road rules to be adapted for open road

The regulatory focus as far has been on enabling testing of autonomous vehicles and providing guidelines for their development. Both are positive steps, however, there is a risk that without clear legislation stakeholders may opt not to follow the guidelines, leading to a discordant development

EU legislation may progress too slowly to be of assistance in coordinating and synchronizing development

Linked to the various aspects of the autonomous vehicles: homologation process, test authorization, data sharing and common platforms

Legislation ready for commercial deployment of autonomous mobility in a controlled environment but not adapted yet to accommodate autonomous mobility on open road with mixt traffic.



Interoperability
Infrastructure

Autonomous vehicles contain information systems that use sensors and machine learning to drive. These systems need to interact with each other as well as with the surrounding systems. These systems must have interoperability to ensure the systems to be safe and smart

Digital infrastructures for connectivity, positioning and battery charging are suitable in all urban areas but hardly available in rural areas





Energy consumption

The green aspect of autonomous electric vehicles could be jeopardized if stronger rules applied if Life cycle analysis were to be applied or if digital pollution regulation were to be stronger.



Cybersecurity and personal data protection

Cybersecurity issues go along with anonymity and personal data protection hardening as well as system's hacking.

Autonomous vehicles should be protected against cyberattacks in accordance with established best practices for cyber vehicle physical systems.

Vehicle manufacturers should ensure that system updates occur as needed in a safe and secure way and provide for after-market repairs and modifications as needed.



Public transport organization & Traffic Regulation

The existence of transport and mobility policies has a positive impact for the implementation of new services as well as the existence of public service delegation.

The existence of an integrator policy organization at local level implementing local mobility policy has a direct impact on operation efficiency.

The local government can fully delegate operations to the integrator and concentrate on needs anticipation and innovation deployment. Therefore, the level of power of a public transport organization may be considered either a barrier or a facilitator.

Autonomous mobility fluidifies road traffic





Benefits



Reduced operating costs

Provides great potential to reduce transport operating costs by enabling a single operator to manage multiple vehicles



Seamless mobility

Connected and smart automated driving has strong potential to reduce transport congestion, travel time and traffic accidents



Improved accessibility

By reducing operating costs, AMOS has the potential to increase transports offerings at affordable prices, boosting transport accessibility and inclusivity



Environmental benefits

Affordable and accessible public transport has the potential to challenge the role and benefits of the private car in future societies, which can lead to significant transport emission curbs.



What is a Vision Statement VS

A vision statement is a high-level, inspirational statement of an idealistic emotional future of a company or group. Vision describes the basic human emotion that a founder intends to be experienced by the people the organization interacts with.

Vision statements may fill the following functions for a company

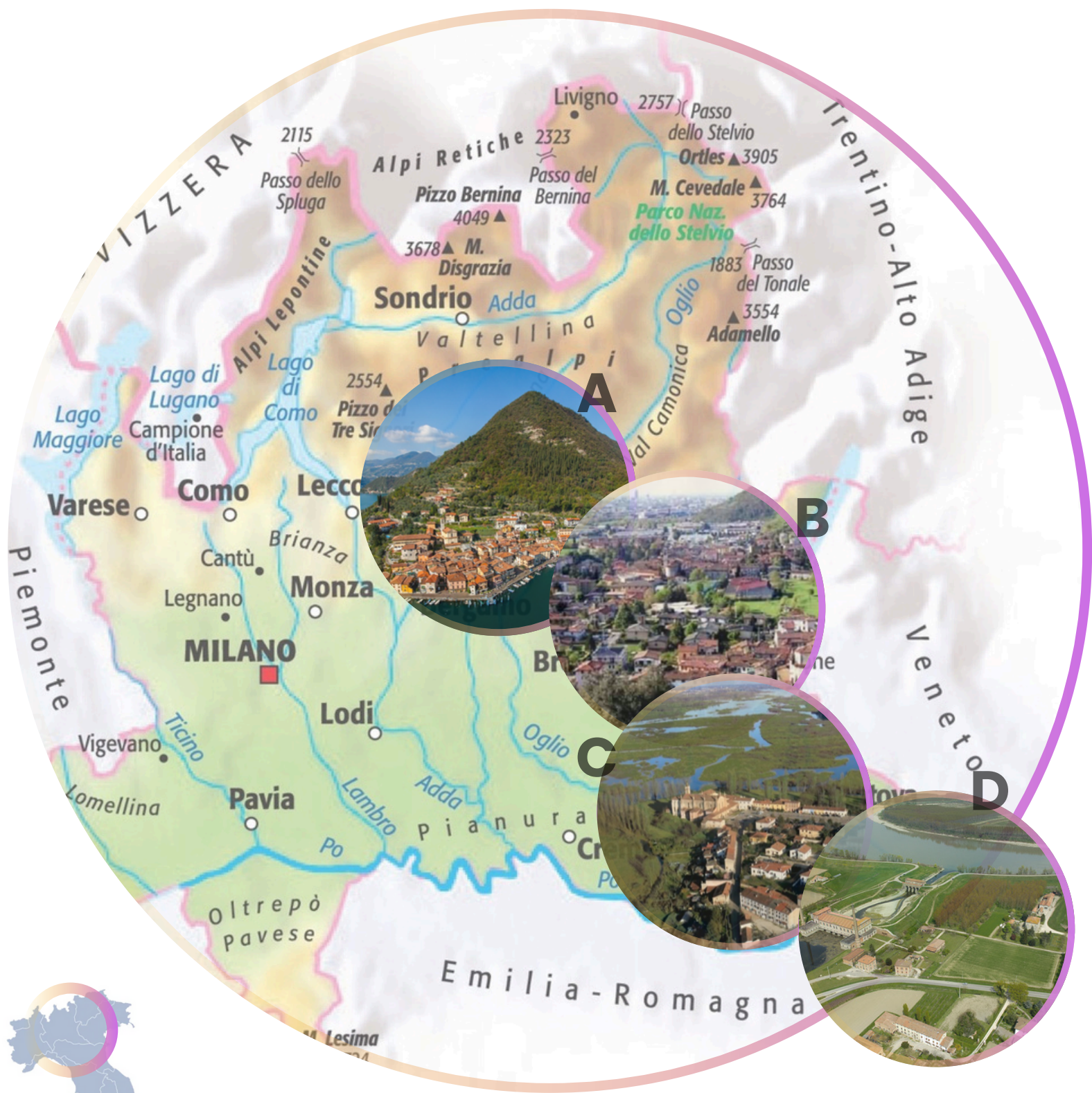
- Serve as foundations for a broader strategic plan.
- Motivate existing employees and attract potential employees by clearly categorizing the company's goals and attracting like-minded individuals.
- Focus company efforts and facilitate the creation of core competencies by directing the company to only focus on strategic opportunities that advance the company's vision.
- Help companies differentiate from competitors.

A consensus does not exist on the characteristics of a "good" or "bad" vision statement. Commonly cited traits include:

- concise: able to be easily remembered and repeated
- clear: defines a prime goal
- time horizon: defines a time horizon
- future-oriented: describes where the company is going rather than the current state
- stable: offers a long-term perspective and is unlikely to be impacted by market or technology changes
- challenging: not something that can be easily met and discarded
- abstract: general enough to encompass all of the organization's interests and strategic direction
- inspiring motivates employees and is something that employees view as desirable



Territorial framework



Province of Brescia

- A. Municipality of Monteisola
- B. Municipality of Collebeato

Province of Mantova

- C. Oltrepò Mantovano, Destra Secchia
- D. Municipality of Curtatone



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Province of Brescia



1,263.685
Inhabitants



Brescia
Capital



205 municipalities
included

The province of Brescia is the largest province in Lombardy, with an area of 4 784.36 km² and a population density of about 264 inhabitants per km².

Road transport

The province is crossed from west to east by the A4 highway, which intersects near the capital with the A21 highway. Due to the local geography, roads move away from the capital toward the periphery through a radial structure that converges on the capital. The load-bearing road axis is the former SS 11, which crosses the province from Chiari to Sirmione via Brescia. Detached from the former SS 11 are former state road 510, which is the gateway to Lake Iseo and Valcamonica, and state road 45 bis, which connects Brescia to Cremona and Trento. The former state road 236 allows the city's connection with Mantova, while Val Sabbia and Val Trompia can be reached by driving along the former state road 237 and the former state road 345, respectively. Since 2014, there has been the A35-BreBeMi that serves the southwestern part of the province (the western Brescia lowlands). The main railway junction is Brescia station, located on the Milan-Venice route.

Public transport by road

In compliance with Regional Law No. 22 of October 29, 1998 the provincial administration has divided the province into four sub-networks:

- Urban sub-network: including the provincial capital and 14 municipalities in the Hinterland;
- Val Trompia, Garda and Valle Sabbia" subnetwork;
- "Bassa Pianura Bresciana and Franciacorta" subnetwork;
- "Sebino and Camonica Valley" subnetwork.

Air transport

The province is home to the Brescia-Montichiari airport, although used primarily for mail and cargo flights, it also accommodates passenger flights

Lake transportation

There is a lake transportation system operating on Lake Garda and Lake Iseo that uses ferries, hydrofoils, and catamarans.

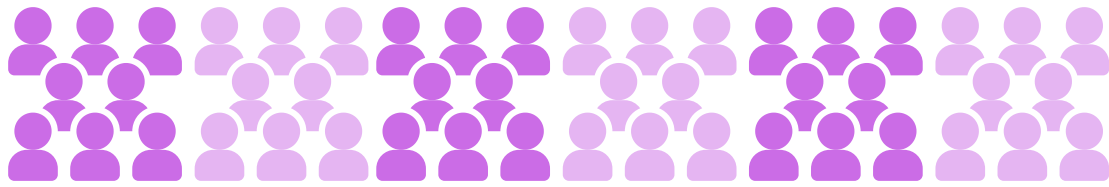


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Stakeholders involved



Municipality of Monte Isola

Within the project the municipality will be directly involved in the development of the VS and the IP and it will result as beneficiary of the AMOD deployment and implementation



Municipality of Brescia

Within the project the municipality will be involved in the development of the VS and the IP and it will result as beneficiary of the AMOD deployment and implementation, as it acts and urban hubs on which Monte Isola and other municipalities of the province belong to



Municipality of Collebeato

Within the project the municipality will be directly involved in the development of the VS and the IP and it will result as beneficiary of the AMOD deployment and implementation.



Province of Brescia

Within ArtMED project, it will act as final beneficiary of the project outputs, since results from the AMOD impact assessment tool, will feed into the development of its vision statement, and an investment plan.



Agenzia Trasporti TPL Brescia

The agency is interested in the project results as within AMOD implementation it will have an additional service offer to provide to the territory it covers.



Arriva Italia

Arriva Italia will act as final beneficiary of the project outputs, since results from the AMOD impact assessment tool, will feed into the development of its vision statement, and an investment plan.



BREscia Mobilità - Brescia trasporti

the company would be the ultimate beneficiary of the introduction of AMOD system since it operates the lines serving Collebeato



Province of Mantova



407.051
Inhabitants



Mantova
Capital



69 municipalities
included

The Province of Mantua borders the province of Verona to the northeast, Rovigo to the east, Ferrara, Modena, Reggio Emilia, and Parma to the south, Cremona to the west, and Brescia to the northwest.

Road Transport

The only highway that runs through the Province of Mantua is the A22. After the transfer of responsibilities from ANAS to the provinces for the management of most of the State Highways, the only SS remaining is the SS12. The other roads are now the responsibility of the province and are referred to as ex-Statali. These are about 300 km of roads in addition to the approximately 900 km of Provincial Roads

Rail transportation

The provincial territory is crossed by the following railway lines:

- Cremona–Mantova railway (Italian Railway Network)
- Verona–Mantova–Modena railway (Italian railway network)
- Mantua–Monselice railway (Italian railway network)
- Verona–Bologna railway (Italian railway network)
- Parma–Suzzara railway (Emilia–Romagna Railways)
- Suzzara–Ferrara railway (Emilia–Romagna Railways)
- Brescia–Parma railway (Italian Railway Network)

The main railway station in the province is Mantua station. The other interchange stations between several lines in the province are Suzzara station and Poggio Rusco station.

Public transport by road

With the enactment of L.R. 22/98, the Provinces became the entities responsible for planning, organizing, modifying and supervising LPT services. The Province performs these functions only with reference to interurban and urban area LPT (that is, affecting the area of the hinterland municipalities): for public transport in urban areas the competent entity is the Municipality of Mantua. Since January 2, 2007, with the birth of “Citypass,” the new model of Local Public Transport introduced by the Province, all interurban “blue” lines in and out of Mantua rely on a system of three through stations.

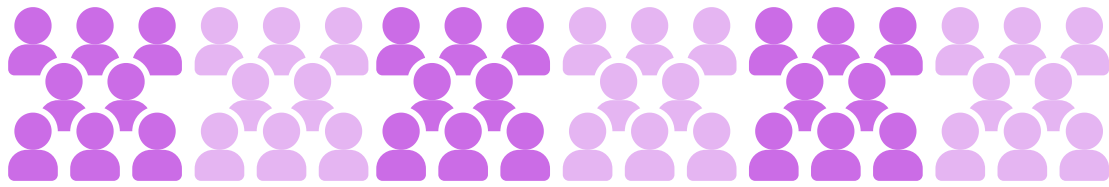


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Stakeholders involved



Consorzio Oltrepò Mantovano

Within the project it will be engaged as representative of the municipalities that will be involved by the AMOD implementation service. It's interest in the project derives primary from the necessity to have a higher level of mobility and accessibility in the territory.



Province of Mantova

Within ArtMED project, it will act as final beneficiary of the project outputs, since results from the AMOD impact assessment tool, will feed into the development of its vision statement, and an investment plan.



Agenzia Trasporti TPL Mantova e Cremona

The agency is interested in the project results as within AMOD implementation it will have an additional offer to provide to the territory it covers.



APAM

Within the project the municipality will be involved in the development of the VS and the IP and it will result as beneficiary of the AMOD deployment and implementation, as it acts and urban hubs for the belt municipalities that will be directly involved in the VS and IP development.



Municipalities of Suzzara, San Benedetto Po, Ostiglia

within the project will be involved in the development of the VS and the IP as one of the main Local Public Transports Hubs of the Oltrepò Mantovano that will be connected to the small municipalities by the AMOD deployment and implementation



Municipality of Curtatone

Within the project the municipality will be directly involved in the development of the VS and the IP and it will result as beneficiary of the AMOD deployment and implementation, since it will be one of the belt municipalities that will be connected to the main Local Public Transport of Mantova



Municipality of Mantova

Within the project the municipality will be involved in the development of the VS and the IP and it will result as beneficiary of the AMOD deployment and implementation, as it acts and urban hubs for the belt municipalities that will be directly involved in the VS and IP development



VISION STATEMENT

PROVINCE OF BRESCIA

BRESCIA – MONTE ISOLA



Monte Isola is one of I borghi più belli d'Italia ("The most beautiful villages of Italy"). It is located on the islands Montisola, Loreto, and San Paolo in Lake Iseo and, as of 2015, its population is 1,770. Monte Isola's population is approximately spread over eleven villages and hamlets. There are several churches built between the 15th and the 17th century with frescoes, statues, altars in vernacular art. Monte Isola can be reached through a network of ferry connection with regular schedules. **Driving restrictions are currently enforced, with mopeds and bicycles only allowed on the island.** An extensive grid of dedicated bike lanes and hiking trails span all over the island, reaching the peaceful fishing villages with lakeside cafés and the Madonna della Ceriola chapel, nested near the summit of the island. A circular trail of almost 9 km allows a complete tour of Monte Isola.



Main objective



To improve mobility connections on the island for tourists (and for residents), in order to improve efficiency (frequency), since now the buses that are used should be tailor-made due to the particular shape of the roads.

Targets



Tourists that reach the Island by ferry during summer period



Residents

Service Design

Service coverage: small→

The territorial framework is limited and restricted since the Island has a limited geographical extension

Operational domain: complex

Vehicle type: bus

Route Predictability: fixed→

Since buses are the only TPL present on the island, they follow a traditional schedule with fixed paths and timetable

Timetable: flexible/fixed

Traffic type: simple

Fleet size: small (4/5 unites).....→

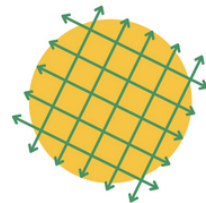
Due to the small geographical extension of the island and to the limited amount of people a fleet of 4/5 unites will be enough to guarantee a support to the existing TPL offer

Special Assistance: yes

Road ownership: public

Speed of service: low (40km/H)

Monte Isola mobility system
Fixed trajectories in terms of time and space



Impact and estimated time of deployment



Less emissions, less acoustic pollution; more vehicles



More accessibility to city services; more tourist attraction; increased TPL offer; higher possibility to move in the island since now the only public transport are in line service (and not on demand)



Less drivers; more maintenance needed for the higher number of vehicles; more tourist attraction and related services

VISION STATEMENT

PROVINCE OF BRESCIA

BRESCIA – COLLEBEATO



Collebeato is an Italian municipality of 4,433 inhabitants in the province of Brescia, in lower Val Trompia, Lombardy. Collebeato, in the northern hinterland of Brescia, is enclosed within the basin of the Picastello, Campiani, Peso, Dosso Boscone and Sasso mountains in the part where the lower Trompia Valley meets the Po Valley, on the easternmost border of Franciacorta, washed by the Mella River. The Municipality, that is located in the northern part of the Brescia territory, is well connected to the city by the public transport line 11, that directly link the municipality to the urban metro-line at the station of Prealpino.

The public transport line 11 will be suspended for at least 1 year since construction works will interest the bridge over the Mella River along which the TPL 11 runs. The lack of TPL will be subsisted temporary by a shuttle that will be provided by the municipality/TPL transport agency. The municipality is mostly characterized by residents that usually go to the city to work and in a small percentage by local tourist that enjoy the nature and the green environment in the surroundings



Main objective



To introduce of a temporary shuttle that will provided by the municipality/TPL transport agency to substitute the bus and that once the works on the bridge will be completed it could remain as a complementary offering

Targets



Residents and local inhabitants that daily move from Collebeato to Brescia and vice-versa: students, workers during the morning and the late afternoon, elderly during the all day

Service Design

Service coverage: large

Operational domain: complex

Vehicle type: shuttle

Route Predictability: fixed/dynamic.....

Timetable: flexible

Traffic type: complex

Fleet size: small (4/5 unites)

Special Assistance: No

Road ownership: public

Speed of service: low (40km/H)

Different vehicles and infrastructures and involved in the territory: private vehicles such as cars and motorbikes, public transport such as metro line and buses as well as bikes

The shuttle will move from Collebeato to Brescia. It could run through different roads but the origin and destination will remain the same



Impact and estimated time of deployment



less private mobility; less traffic congestions; more offer in termism of services timing; less emissions



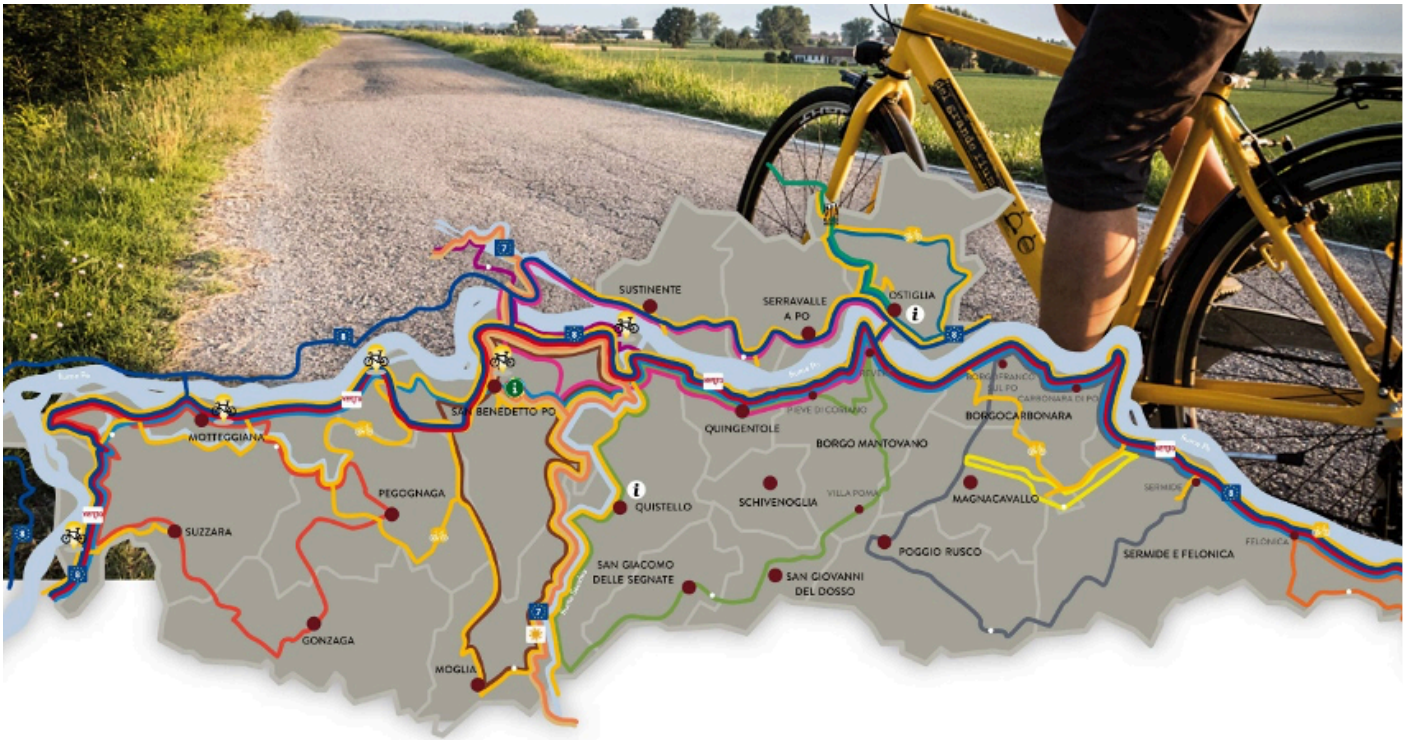
more accessibility to city services in the way home-station; increased TPL offer



Less drivers; more maintenance needed for the higher number of vehicles

VISION STATEMENT PROVINCE OF MANTOVA

OLTREPO MANTOVANO – DESTRA SECCHIA



The Oltrepò Mantovano is one of the few territories in Lombardy that extends beyond the Po River whose territory is wedged between that of the Emilia provinces of Reggio Emilia, Modena and Ferrara and the Veneto provinces of Rovigo and Verona. Sixteen of these municipalities, along with four others located on the left bank of the river, are united in the Oltrepò Mantovano Consortium. Among the most important towns are Gonzaga and Suzzara near the border with Emilia-Romagna. The more than 470 kilometers of cycle paths in the Oltrepò Mantovano, a paradise for bicycle enthusiasts, innervate this microcosm by linking towns and hamlets, historic buildings, museums, waterworks, and the protected areas of the Parks System, farm outlets, agritourisms and hotels, grafting themselves to the network of national cycling tourism routes of Ciclovía del Sole (Verona - Florence) and VENTO (Venice - Turin) and transnational EuroVelo 7 (North Cape - Malta) and EuroVelo 8 (Cadiz - Cyprus). **The territory is characterized by low population density and weak transportation demand, followed by a high private car dependency**



Main objective



To increase public transportation in the 10 municipalities located east of the Secchia River improving connections with the main nodes of the automobile and railway networks located in the conterminous municipalities (Suzzara, San Benedetto Po, Ostiglia)

Targets



Residents and local inhabitants: mainly young and elderly with limited accessibility to private vehicles for different reason (absence of driving license, age, etc, healthy issues, etc)

Service Design

Service coverage: large

The territory is wide extended along the right side of the Destra Secchia and it covers small municipalities

Operational domain: complex

Vehicle type: shuttle/bus

Route Predictability: dynamic

The bus/shuttles will not follow a fixed routes but will freely moves in the territory to reach all the small municipalities

Timetable: flexible

The bus/shuttles will have to guarantee accessibility on the territory for residents

Traffic type: simple

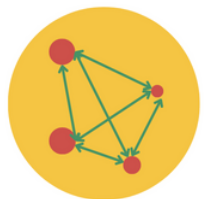
Fleet size: small (max 10 unites)

Special Assistance: yes

Road ownership: public

Speed of service: low (40 km/h)

Oltrepò Destra Secchia mobility system
Small scattered links between the population centers in the area



Impact and estimated time of deployment



less emissions, less private veichcles



larger offer and accessibility for weaker categories of users (students, the elderly), encouraging mobility within the project area and interchange with the road and rail public transport network



better use of the limited financial resources available, given that driving personnel account for more than 60 percent of the cost of public transportation service à less drivers

VISION STATEMENT

PROVINCE OF MANTOVA

MANTOVA – CURTATONE



Of the four municipalities in Mantua's urban belt, Curtatone is the one located southwest of the provincial capital. With a population as of 01/01/2024 of 14,688, it has a dense urbanized belt developed close to the border with Mantua. The remaining part of the territory, predominantly rural, is dotted with several hamlets. At the north-western end is the village of Grazie di Curtatone, dating back to around the 11th century and included among the most beautiful in Italy in 2011. The environmental context in which it is located is that of the Mincio Regional Park, the site of community importance (SIC IT20B0017) "Ansa e Valli del Mincio" and the "Natura 2000" network. Since ancient times the village has been a destination for pilgrims from Mantua and neighboring states to give thanks for the miraculous Image of the Madonna and Child to whom the name "Madonna delle Grazie" was later given.

The territory is characterized by the presence of a dense urbanized urban belt in which there is a massive use of private cars.



Main objective



To extend the public transport network in a capillary way starting from the terminus points of the urban area services (suburban bus lines) that guarantee connections with the center of Mantua, improving the distribution on the last mile

Targets



Residents and local inhabitants that daily move from the small municipalities in the Mantova belt to the City and vice-versa: students, workers during the morning and the late afternoon, elderly during the all day

Service Design

Service coverage: small

Operational domain: simple

Vehicle type: shuttle

Route Predictability: fixed/dynamic

Timetable: flexible

Traffic type: simple

Fleet size: small (3/4 unites)

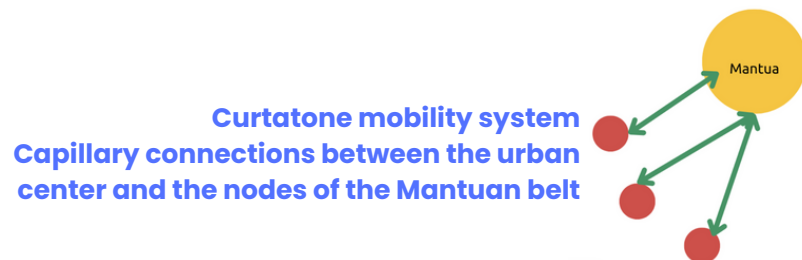
Special Assistance: No

Road ownership: public

Speed of service: low (40km/h)

Private vehicles such as cars and motorbikes are the most present vehicles in this territory, followed by public transports (buses)

The bus/shuttles will have to guarantee accessibility on the territory for residents



Impact and estimated time of deployment



reduction in pollutant emissions and energy consumption compared to the current public transport system.



a more flexible and possibly real-time-booked transportation offer can become a competitive alternative to private mobility in travel to/from the provincial capital, compared to traditional scheduled services

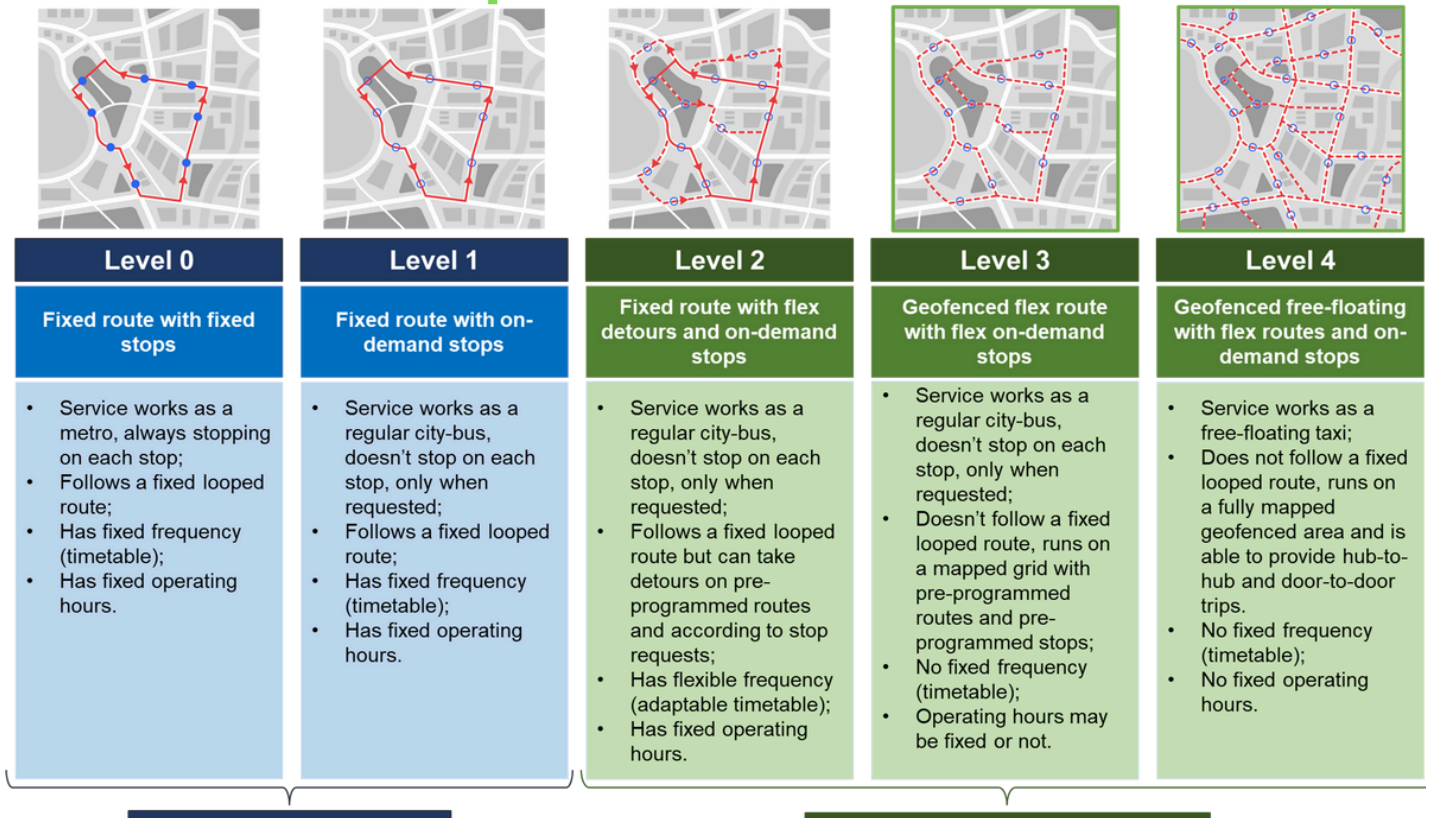


better use of the limited financial resources available, given that driving personnel account for more than 60 percent of the cost of public transportation service à less drivers

4

TOWARDS INVESTMENT PLANS

Operational models



ArtMED Vision Statements state of the art

	Level 0 Fix route & stops	Level 1 Fix route, on-demand stops	Level 2 Flexible route	Level 3 Geofenced flexible route	Level 4 Geofenced on-demand
Rural areas					
Suburban areas			Oltrepò Mantovano Curtatone		
Urban Areas			Collebeato		
Tourist destinations	Monte Isola				



LIST OF ABBREVIATION

VS: Vision Statement

IP: Investment Plan

AMOD: Autonomous mobility on demand

BS: Brescia

MN: Mantova

PT: Public Transport

TPL: Local Public Transport

EU: European Union





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