

Joint MSc Transformative Sustainability
Università Bocconi and Politecnico di Milano

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WHY ROME NEEDS A NEW MOBILITY CORRIDOR

Urbanization *is increasing the pressure on the city as more people are moving within* ***limited urban space***



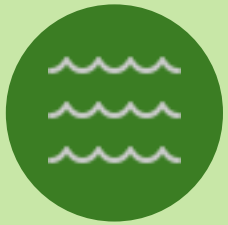
URBAN MOBILITY PRESSURE

- **45.2%** average congestion level in Rome
- **115 h** lost in rush-hour traffic per driver in 2025



GROWING NEED FOR ALTERNATIVES

Rome is already shifting towards more diverse mobility options: **13.6M shared-mobility rentals in 2024**



AN UNDER-UTILIZED ASSET

The **Tiber** crosses the city but is **not part of** Rome's everyday **public transport network**

4.16 million car and motorbike trips  **60%** vs **5%**  **0.93 million** public transport trips



FOR THE PEOPLE OF ROME

An everyday transport for **residents**, commuters, students and anyone who needs to move across the city

TIBERCONNECT



A ZERO EMISSION RIDE

Electric waterbus with a capacity of around **60 passengers** ensure a **sustainable**, safe and **time-saver** journey

A SCALABLE MODEL

TiberConnect is not just for Rome. It is a **modular** and **adaptable model** that can be implemented on other river cities where waterways are still underused

INTEGRATED SYSTEM

a service **fully integrated** with the existing public transport network (metro, buses, cycling and pedestrian routes) to offer a real alternative to private cars

ACCESSIBILITY

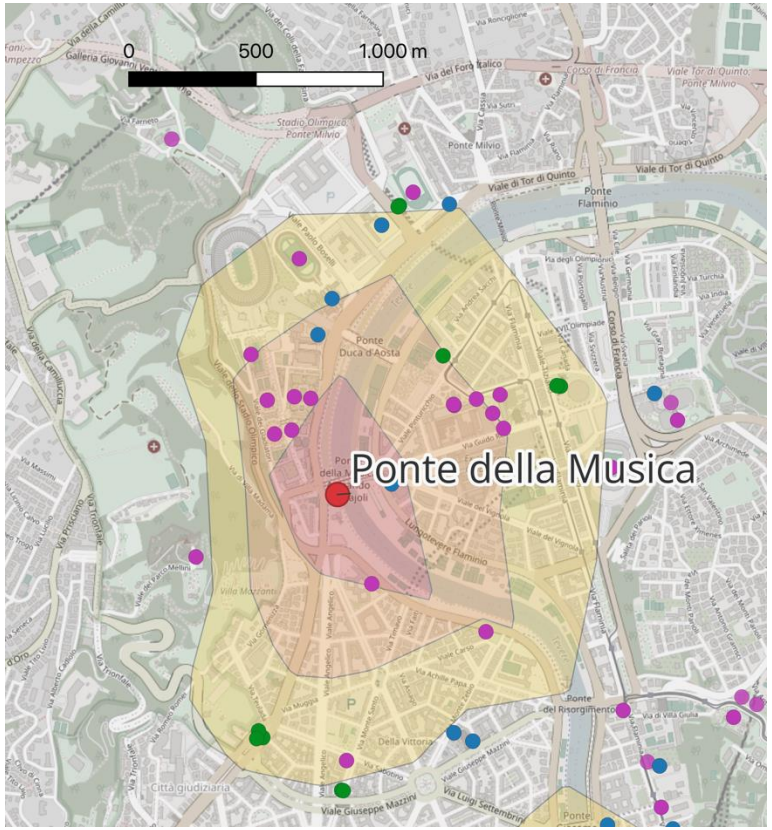
Each station is designed to ensure **step-free access** between the city, the embankment and the water, with ramps, elevators and floating pontoons that adapt to river levels

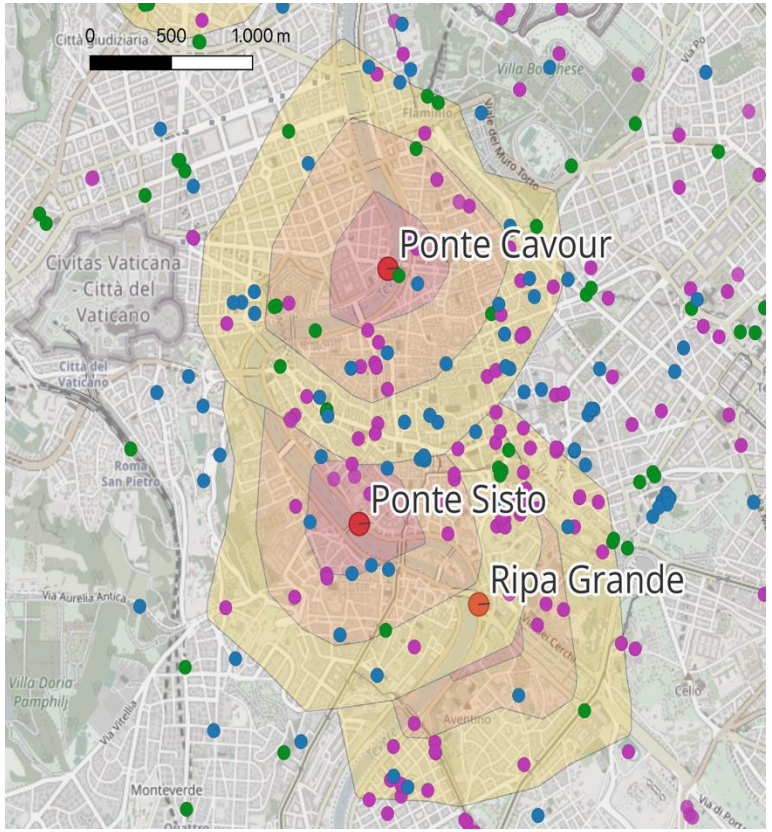
TWO LINES, ONE NETWORK

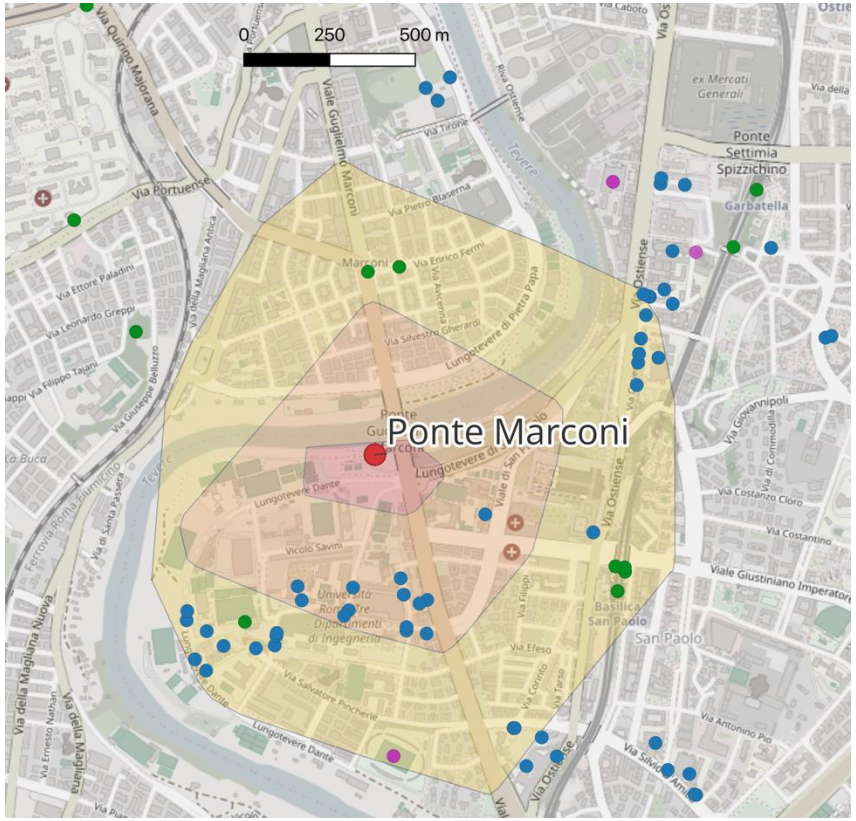
Two interconnected lines (Noth and South) link Ponte della Musica to Ponte Marconi. One-way travel takes **21–23 minutes on the North Line** and **16–20 minutes on the South Line**, plus **5 minutes at each stop** for boarding and disembarking. A 600 m **electric shuttle** connects the two lines in 2 minutes

CATCHMENT AREA

QGIS elaboration based on ISTAT 2021 data

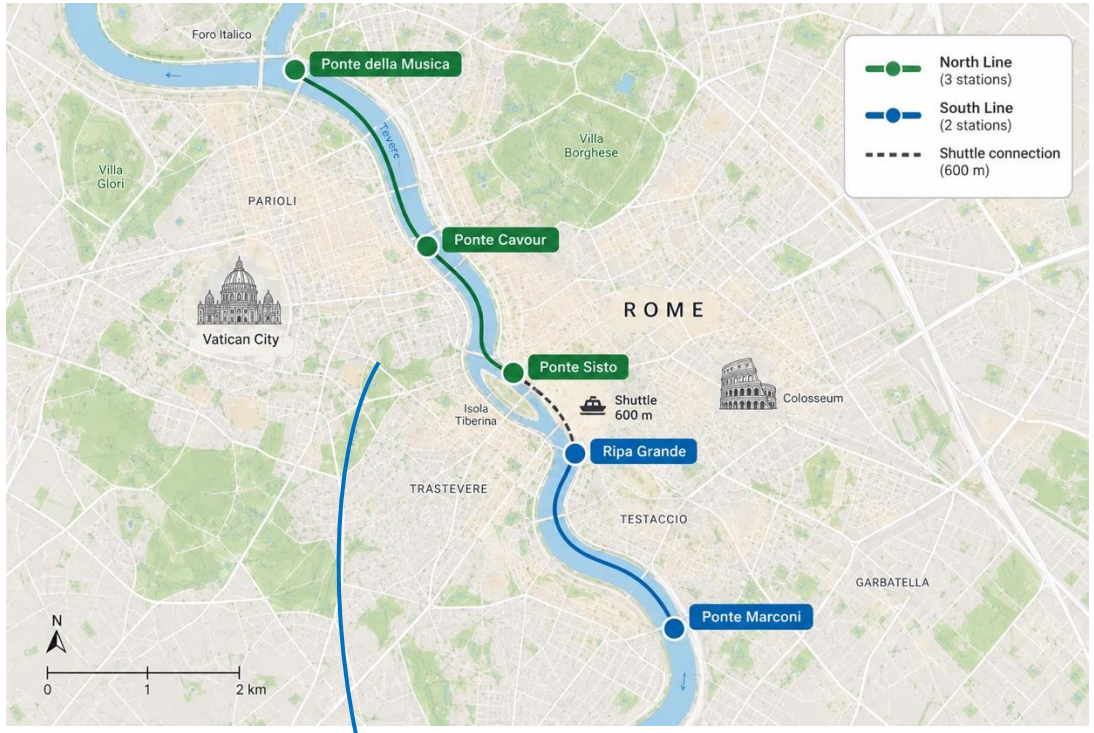




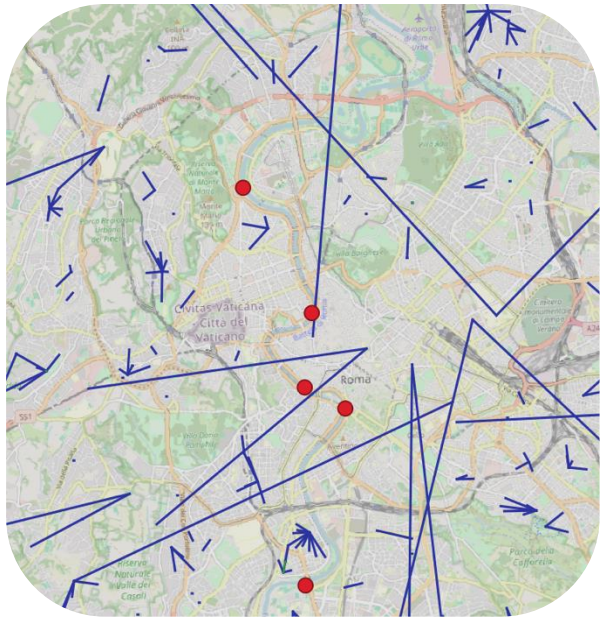


- Tiberconnect stops
- Public Transport
- Attractions, museums, arts
- Universities

- Catchment area, 5 mins from stop
- Catchment area, 10 mins from stop
- Catchment area, 15 mins from stop



AI generated image



OD matrix (QGIS elaboration based on ISTAT 2011 data)

TIBERCONNECT

CATCHMENT AREA

≈ 220,000 **Potential Population**
15-minute walk from stops | Tourists excluded

136,463
RESIDENTS
Sum of stop catchments

43,326
STUDENTS
20% resident overlap assumed

≈ 50,000
INBOUND WORKERS
50% of 100,000 assumed corridor-aligned

≈ 71,500 **Scenario-based target users**
Potential audience, not forecast passengers

11,000 people
Public transport users
220,000 × 5%

+

27,500 people
Walking / cycling
220,000 × 25% × 50%

+

33,000 people
Car / motorbike shift
220,000 × 60% × 25%

Estimates assume 20% student-resident overlap and 50% of inbound workers travelling along the corridor. The target-user scenario applies a 5% public transport share, 50% of the 25% walking/cycling share, and 25% conversion of the 60% car/motorbike share.
Tourists are excluded and spatial overlap between catchments remains unadjusted.



CATCHMENT AREA

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SUCCESSFUL EXAMPLES

LONDON

Structure & characteristics:

Private operator, public integration

- Uber Boat by Thames Clippers
- Operates **commercially**
- Use of public piers
- 5.3M+ passengers in 2024.

Key feature:

Premium but differentiated pricing

- Higher fares for occasional users
- Strong discounts for commuters
- Monetises tourism while **retaining recurring demand.**

Financial model:

Fare-led and privately financed

- **Revenue of £47.1M in 2024**, £3.65M pre-tax profit.
- Fleet and infrastructure expansion rely on **private equity** and **bank debt**
- **£59M financing package** in 2025

AMSTERDAM

Structure & characteristics:

Public-service model

- GVB Veren operates ferries
- **Long-term service contract**
- **27.9M passengers in 2024**
- **Free** for pedestrians and cyclists.

Key feature:

Capacity rather than fare revenue

- Ridership measures **mobility demand and social utility,** not commercial yield
- **Free access supports high ridership and broad accessibility.**

Financial model:

Municipality-funded operations and assets.

- About **96% of 2024 net turnover** from the municipal contract
- **Public contributions** financed almost all disclosed ferry investment

VENICE

Structure & characteristics:

Public in-house network

- ACTV operates within AVM's public transport framework
- Water transport is essential for **everyday mobility**

Key feature:

Strong price discrimination.

- A standard 75-minute ticket costs €9.50, versus €1.50 for eligible Venezia Unica users
- **Monetization on visitors rather than frequent local users.**

Financial model:

Farebox + public support

- Substantial ticket revenues with public-service payments
- Fleet renewal is additionally supported by regional and national public funding.

WHAT TIBERCONNECT BRINGS TO ROME

TIBERCONNECT

Structure and characteristics

Integrated public-service network

- **5 strategically located stops**
- Fully **electric** catamarans carrying 60 passengers
- Service designed for residents, commuters, students and visitors
- **Integration with metro, buses,** cycling routes and pedestrian connections
- Accessible, **modular** and flood-resilient stations

Key feature

Everyday mobility with differentiated pricing

- Reliable service throughout the day, with **10 - 15 minute frequencies**
- Affordable fares for **residents and students**
- Higher fares for visitors (**Tiber Experience Pass)**
- **Zero-emission, step-free and comfortable** transport
- Tourist demand supports the service without compromising its **public-mobility function**

Financial model

Performance-based public-private partnership

- Roma Capitale defines **routes, fares and service standards**
- The private partner **designs, operates and maintains** the system
- Public-service payments cover the gap between commercial revenue and operating costs
- Diversified revenues from **fares, advertising, sponsorships, charters and partnerships**
- Long-term contract

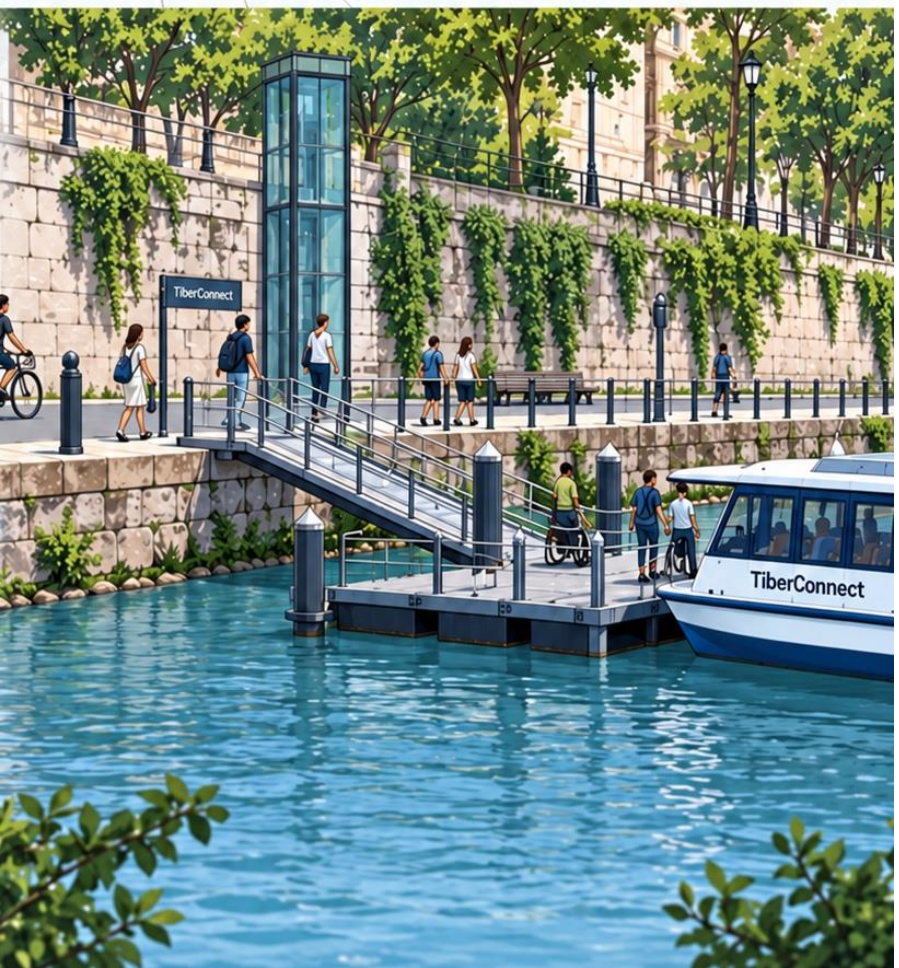
Mobility demand and accessibility care of Amsterdam

Tariff differentiation between residents and visitors of Venice

Private-Public integration of London

*AI generated rendering





TIBERCONNECT

STATIONS

1 CITY LEVEL

- Interconnection with public transport (bus, metro, tram, etc.)
- Waiting area, ticketing and real-time information
- Step-free access (stairs and/or elevator)

2 EMBANKMENT LEVEL

- Continuous pedestrian and cycle path
- Integrated with the riverside path
- Pre-boarding area with seating and shade

3 WATER LEVEL

- Accessible gangway (small ramp)
- Floating pontoon (adapts to water level variations)
- Electric waterbus (both directions)

NORTH LINE STATIONS

Proposed locations and site-specific access solutions

Ponte della Musica



- **Location**
  Right bank, Foro Italico side, immediately downstream of the bridge
- **Access**
  Existing stairs and ramps, complemented by a new accessible elevator
- **Station layout**
  Compact pre-boarding area, mobile gangway and floating pontoon serving both directions

Ponte Cavour



- **Location**
  Right bank, between Prati and Palazzo di Giustizia
- **Access**
  Existing stone stairs retained, with a new elevator connecting Lungotevere Prati to the lower embankment
- **Site approach**
  Limited intervention preserves the existing riverfront infrastructure

Ponte Sisto



- **Location**
  Left bank, providing access to Via Giulia and the historic centre
- **Connection to Ripa Grande**
  A dedicated 600 m electric shuttle links the two stations along the embankment
- **Berthing area**
  Floating pontoon near Tiber Island, with suitable depth and manoeuvring space for the vessels

**AI generated renderings*

SOUTH LINE

TIBERCONNECT

Ripa Grande



- **Location**
  Between Ponte Sublicio and the San Michele complex, filling a public transport gap in the southern historic centre
- **Access**
  Accessible, flood-resistant dock reusing the historic ramp of the former Ripa Grande harbour, restoring access to the river
- **Nearby attractions and demand**
  Convenient access to Tiber Island and Circus Maximus. Serves the neighbourhood throughout the week and visitors to Porta Portese market

Ponte Marconi



- **Location**
  Left bank, downstream of Ponte Marconi, within the redeveloped Tibersi river park. Southern terminus of the line
- **Existing landing**
  Landing used by the Ostia Antica boat service, adaptable for shared use with Tiberconnect
- **Connections**
  Walking and cycling route linking the stop to Metro B, Roma Tre University, Ostiense and the wider transport network
- **Access**
  Accessible ramps connecting the upper and lower levels, alongside stepped seating and the iron staircase

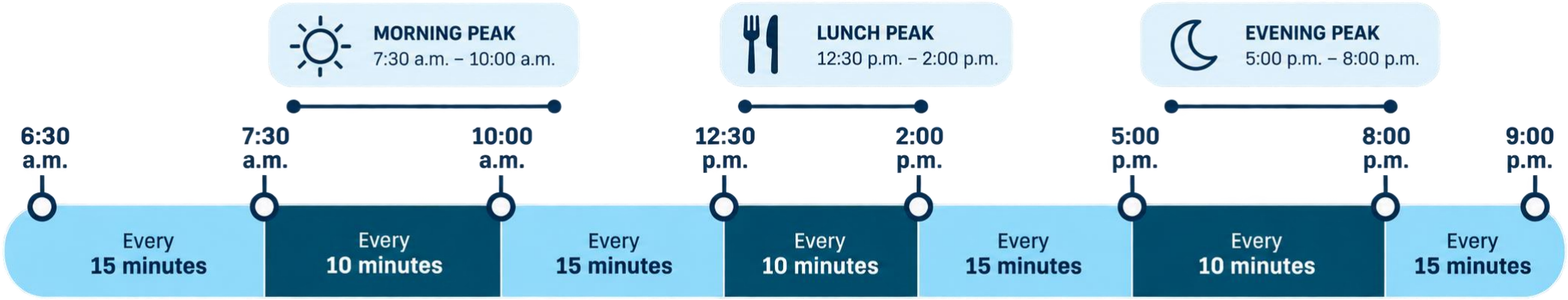
**AI generated renderings*

SERVICE SCHEDULE

- Operating time: **6:30 a.m. – 9:00 p.m.**
- Operating days: **350 days/year**

- Different frequency for **peak** and **off-peak hours**
- Time slots will be adjusted according to actual passengers demand

- Roma resident ticket: €1.50
- Student ticket: €1.00
- Non-resident ticket: €4.00
- Tiber Experience **24h pass:** €15.00
- Supplementary fare for ATAC annual/monthly transport pass holders



Preliminary schedule based on the current service frequencies of other public transport options in Rome on weekdays

INTERCONNECTIONS

The five stations are located close to existing **public transport corridors**, allowing to **extend its effective catchment** and the range of **destinations** well beyond the Tiber corridor

PONTE DELLA MUSICA

- **Tram** 2
- **Bus** 32, 69, 280, 301, 628…

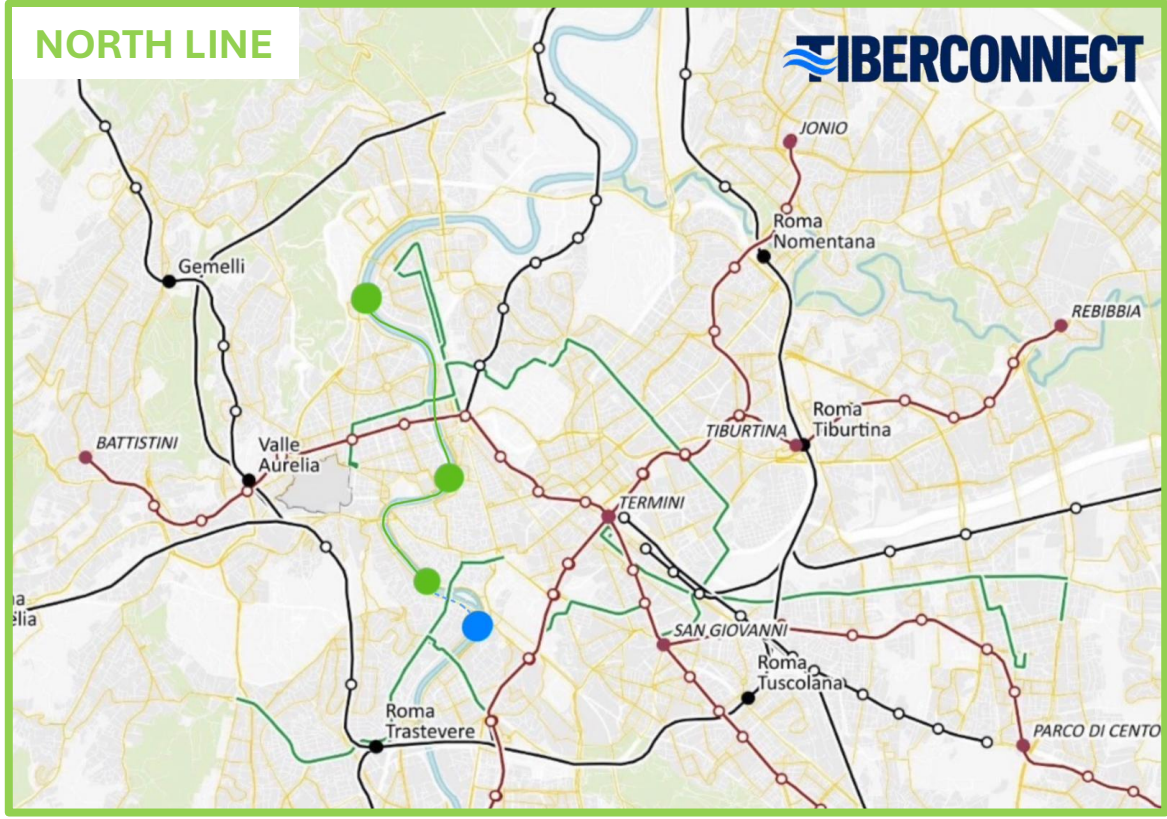
PONTE CAVOUR

- **Tram** 19L > **Railway** Valle Aurelia
- **Subway** Line A
- **Bus** *line 30 express* (EUR), 70, 990…

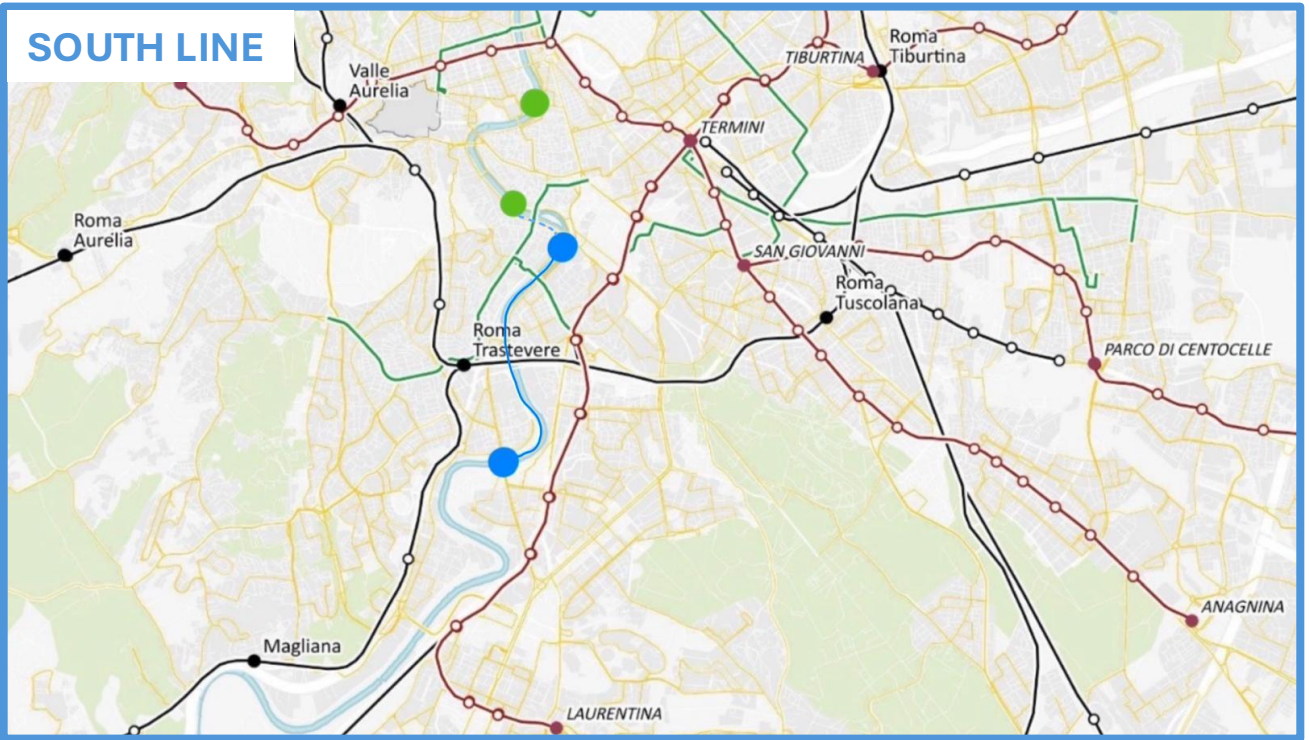
PONTE SISTO

- **Tram** 8
- **Subway** Line A
- **Bus** 23, 62, 63, 64, H, 280…

NORTH LINE



SOUTH LINE



Railway
Subway
Tram
Bus

North line stops
South line stops

Rome PUMS
Public Transport Network (page 85)

RIPA GRANDE

- **Tram** 3, 8 > **Railway** Trastevere > Fiumicino airport
- **Subway** Line A, B
- **Bus** *line 30 express* (> EUR), *line 51 express* (> S. Giovanni)

PONTE MARCONI

- **Railway** *Trastevere* > Fiumicino airport; *S. Paolo* (Metromare)
- **Subway** Line B, B1
- **Bus** 170, 766, 791, 792, 128, 669, 670, 23…

TRAVEL TIME COMPETITIVENESS

NORTH LINE **26** minutes

TOTAL TRAVEL TIME: 56 min to **1h**
including waiting time

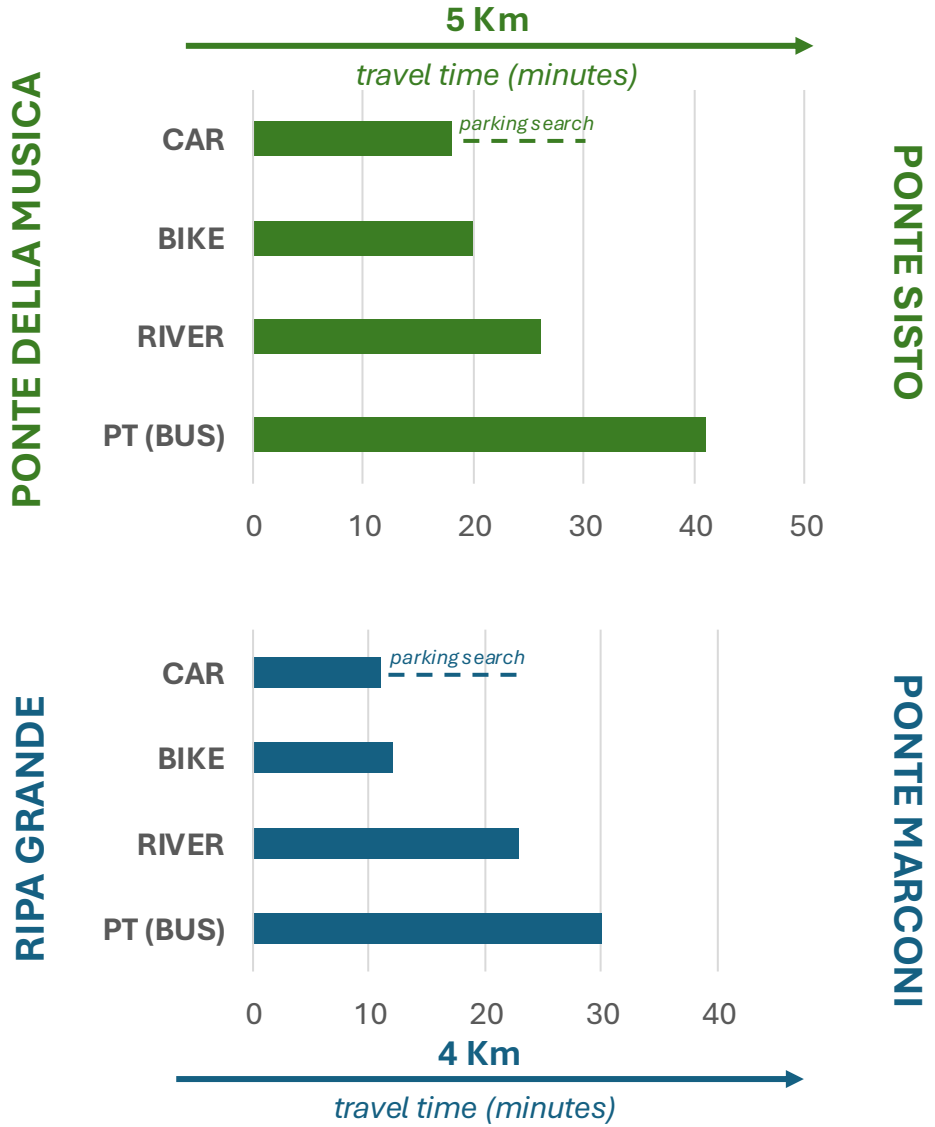
SOUTH LINE **23** minutes

CAR: 18 - 45 minutes

BIKE: 33 minutes

BUS: 1h 14 minutes (no changes)

Sources: Google Maps (scheduled journey on Monday at 8am) and project operating assumptions.



MOBILITY AS A SERVICE (*MaaS*)

atac ROMA

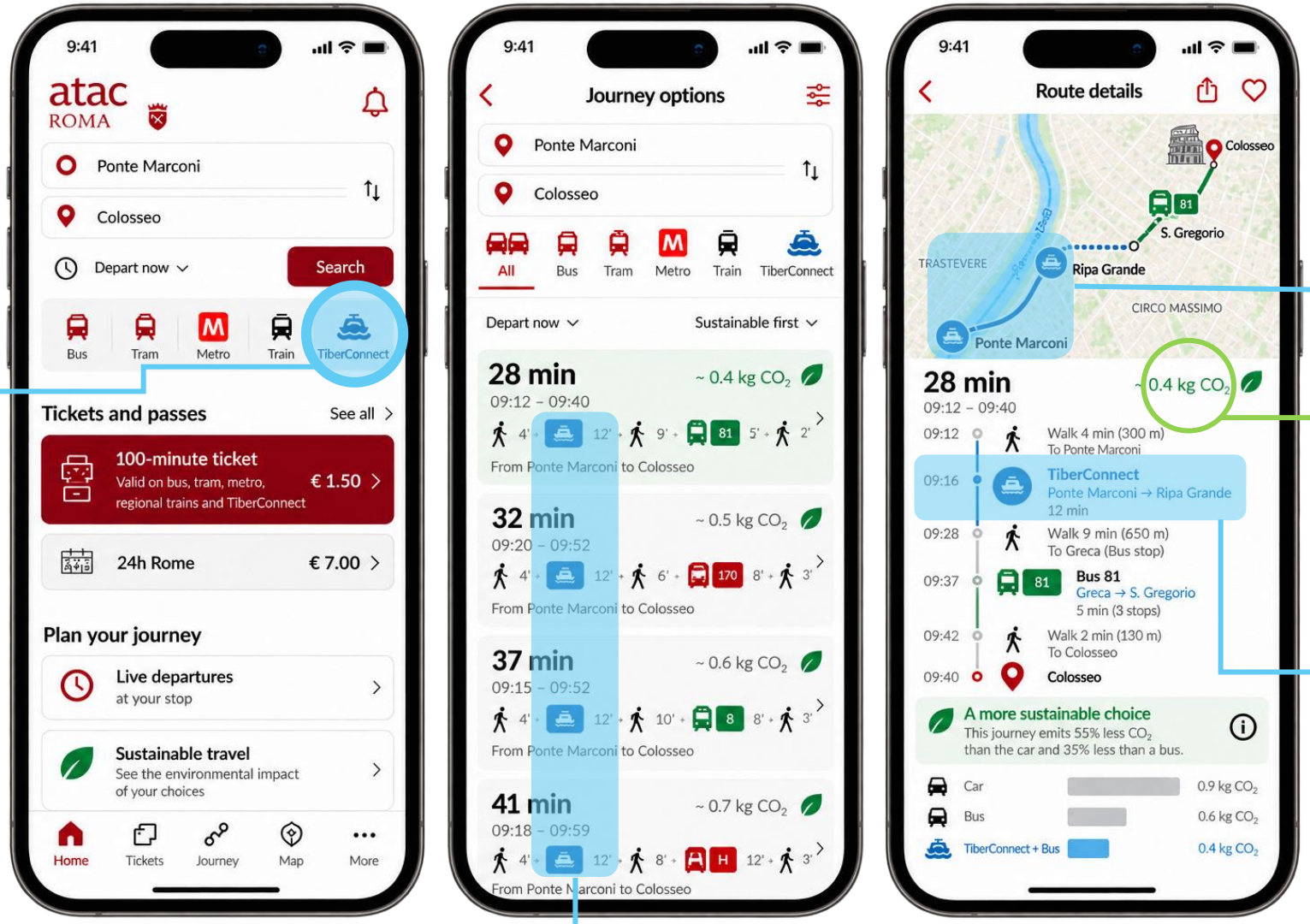
TIBERCONNECT

INTEGRATED MOBILITY ECOSYSTEM

TiberConnect will be included alongside **bus, tram, metro and rail** within the same mobility platform

MULTIMODAL JOURNEY PLANNING

Our new travel mode will be automatically part of the **alternatives and combinations of travel options**.



SEAMLESS ROUTE INTEGRATION

TiberConnect stations and river segments are displayed directly within the **door-to-door itinerary**.

ENVIRONMENTAL IMPACT AT A GLANCE

CO_2 emissions are shown for each travel alternative, supporting more sustainable choices.

SEGMENT-LEVEL TRIP INFORMATION

Travel time, walking distance, transfers and transport mode are shown for **each leg of the journey**

*AI generated image

VESSEL FEATURES

- 14 fully electric waterbus
- Solar PV to support onboard services
- Fast and Slow charging points
- Capacity of 60 passengers/vessel
- Step-free boarding and wheelchair spaces
- Area for bicycles
- 1 qualified skipper + 1 passenger officer



DEPOTS STRUCTURE

North Line Depot

- Placed in **Ponte Sisto**
- It will accommodate the mooring of **8 vessels** (7 + 1 spare)
- It will feature **8 slow-charging** stations and **5 fast-charging** stations

South Line Depot

- Placed in **Ponte Marconi**
- It will accommodate the mooring of **6 vessels** (5 + 1 spare)
- It will feature **6 slow-charging** stations and **4 fast-charging** stations



*AI generated rendering

LOAD FACTOR & REVENUES

	CONSERVATIVE	BASE	OPTIMISTIC
Catchment area	71,500	71,500	71,500
Daily active users	3,633	5,330	7,145
Journeys per user per day	2	2	2
Average segments per journey	1.5	1.5	1.5
Passenger-segments per day	10,899	15,990	21,435
Seat-segments per day	25,920	25,920	25,920
LOAD FACTOR	**42%**	**62%**	**83%**

	CONSERVATIVE	BASE	OPTIMISTIC
Passenger segments per day	(25.920/1.5)*0.42 = 7,257.6	(25.920/1.5)*0.62 = 10,713.6	(25.920/1.5)*0.83 = 14,342.4
Annual passenger journeys (350 days)	2,540,160	3,749,760	5,019,840
Average ticket price*	€1.987	€1.987	€1.987
Annual ticket REVENUE	**5,047,298**	**7,450,773**	**9,974,422**

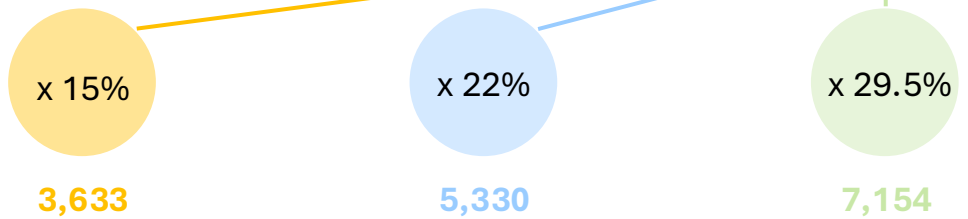
** Weighted average based on proportional breakdown of passenger types within the catchment area*

From the addressable users value obtained from the catchment area analysis we estimate the daily trips:

71,500 Addressable users x 2.5 Trips per person per day *Rapporto Mobilità* = **178,750** Daily trips

Given the percentage of daily trips made to reach workplaces or places of study, we are able to calculate the potential daily systematic users of our service:

(178,750 Daily trips x 27.1% Systematic work and study trips *Rapporto Mobilità*) : 2 Round trip = **24,220** Potential daily systematic users

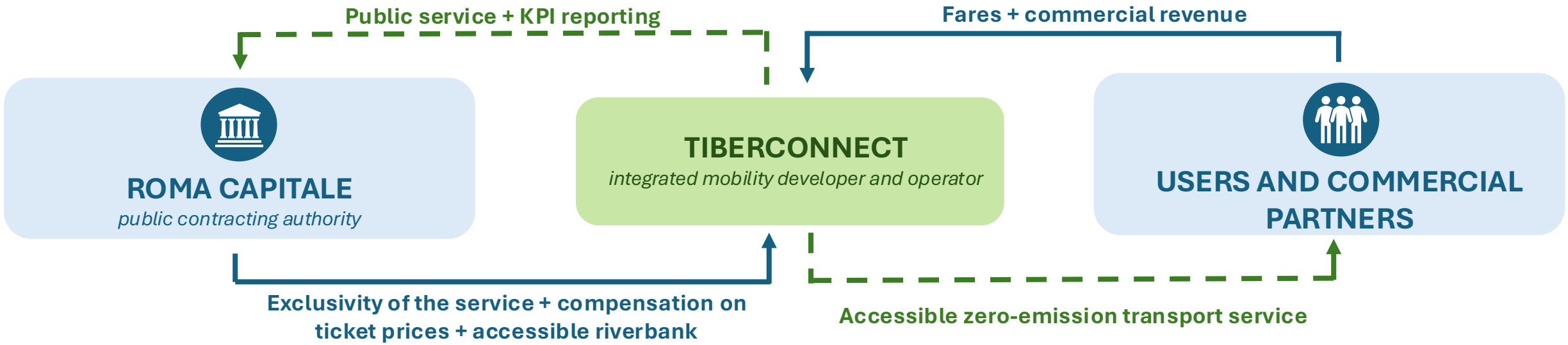


Daily active users

Tourist demand is excluded from the estimation, making the scenarios focused only on regular resident, worker and student mobility

PUBLIC-PRIVATE OPERATING MODEL

Long-term Design-Build-Finance-Operate-Maintain PPP



- Launches the competitive **tender**
- Provides public land and access **rights**
- Provides **partial fare subsidies**, paid annually to the service operator, if ticket prices are deemed too high to be borne entirely by passengers
- **Integrates** the **service** into Rome's transport network

IMPLEMENTATION

- Raises private financing
- Designs the network and operating model
- Designs and develops stations
- Procures and commissions the vessels
- Installs and commissions operating systems

OPERATIONS

- Operates the river service collecting ticket revenues
- Maintains vessels and infrastructure
- Reports performance against contractual KPIs
- Bears construction, lifecycle and availability risks

- **Pays** individual fees or annual ATAC supplement
- **Integration** with existing transport passes through an optional river-service supplement
- **Advertising opportunities** for commercial partners

RISKS AND CASH FLOWS

PUBLIC TENDER

The company incurs several costs before knowing whether it will win the tender: feasibility and engineering studies, demand and financial analysis, tender preparation, legal and authorisation support

Risk mitigation strategies

The public authority will cover part of the project costs if the public contract is not awarded.

Italian procurement rules similarly treat the absence of guaranteed recovery of investments or operating costs as evidence that operating risk has transferred to the concessionaire

Cash inflows =

MUNICIPAL COMPENSATION

- Compensation on ticket prices (fixed annual amount)

+

COMMERCIAL REVENUE

- Advertising and sponsorship
- Charters and tourist products
- Tickets

-

PERFORMANCE DEDUCTIONS

- Poor and unreliable service
- Fleet inavailability
- Poor social value generated
- Negative passenger satisfaction and flow
- Poor energy efficiency

ECONOMIC ANALYSIS: CAPEX

STATIONS CAPEX	Total
DIRECT WORK *	11.39
ADDITIONAL COSTS **	9.21
STATIONS TOTAL CAPEX	***20.6***
VESSELS CAPEX	Total
PURCHASING COST ***	19.6
ADDITIONAL COSTS ****	3.89
VESSELS TOTAL CAPEX	***23.49***
TOTAL CAPEX	***44.09***

All the costs are to be considered in millions of €, excluding VAT

**: Preliminary surveys, bathymetry, geotechnical assessment, underground utilities, and site preparation; Pier, gangway, piles/anchors, fenders, bollards, and marine structures; Waiting area, lightweight canopies, bike hub, furnishings, and technical room; Lighting, CCTV, SOS, PA, ticketing, and passenger information; Electrical power supply and shore power;*

***: Design, permitting, project management and testing; Technical and authorisation contingency; Construction-period inflation*

****: 14 vessels for €1,40 M each*

*****: Prototype engineering and first-of-class testing; Delivery to Rome and commissioning ; Initial spare parts, diagnostic equipment and crew training; Owner's engineer, acceptance tests and classification support ; Procurement contingency (approximately 10%)*

ECONOMIC ANALYSIS: OPEX

	Cost
ANNUAL OPEX *	€9.43 M
AVERAGE MONTHLY OPEX	€786,000
AVERAGE DAILY OPEX	€25,800
AVERAGE OPEX PER OWNED VESSEL, INCLUDING SYSTEM COSTS	€674,000/year

*: component; personnel; energy; vessel maintenance and battery reserve; station operation and maintenance; insurance, IT, administration and other service costs

	CONSERVATIVE	BASE	OPTIMISTIC
Annual ticket revenue	5,047,298	7,450,773	9,974,422
Estimated additional revenue stream from advertisments, sponsorships and chartering	550,000	550,000	550,000
Total commercial revenue	**5,597,298**	**8,000,773**	**10,524,422**
(OPEX)	9,430,000	9,430,000	9,430,000
Operating funding gap/(surplus)	**3,832,702**	**1,429,227**	**(1,094,422)**

Figures are Year 1 estimates. The operating gap excludes the operator fee and capital recovery.

CONSOLIDATED ECONOMIC ANALYSIS

44.09 M€	44.09 M€	9.43 M€	20 years	74%
Total CAPEX	*Private financing*	*Year 1 OPEX*	*Concession duration*	*Break-even load factor*

Component – Year 1 in million euros		CONSERVATIVE	BASE	OPTIMISTIC
OPEX		(9.43)	(9.43)	(9.43)
TiberConnect operating margin	8% × €9.43 M€	0.75	0.75	0.75
Commercial revenue retained	Fares + ancillary revenues	5.60	8.00	10.52
Operating results before compensation	Commercial revenue - OPEX	(3.83)	(1.43)	1.09
Potential municipal fare compensation	Considering base case fare compensation	**2.18**	**2.18**	**2.18**
Profit/Loss		**(1.65)**	**0.75**	**3.27**

How would private investors be able to recover their capital?

- EU/public grants for part of the €44.09m CAPEX
- A smaller privately financed component
- Higher tourists and premium fares
- Additional commercial rights
- A combiantion of the above

TIMELINE OF THE PROJECT

TIBERCONNECT

Development and feasibility (0-10 months)

- Establish the **project team** and engage **stakeholders**
- **Assess** demand, navigability, flood risk and site conditions
- **Define** station layouts, accessibility and charging requirements
- **Develop** the operating model, PPP proposal and financial plan

Approvals, funding and tender (10-30 months)

- Submit the **proposal** to Roma Capitale
- Complete **municipal evaluation** and required revisions
- Obtain river **concessions** and environmental and heritage **approvals**
- Define **funding arrangements** and prepare **tender documents**

PPP and financial close (30-45 months)

- **Launch** the competitive **tender**
- **Evaluate** technical and financial bids.
- **Selection of the bidder** and finalization of the agreement
- Secure financing and guarantees, reaching **financial close**

Construction and vessel delivery (45-64 months)

- Finalise detailed design and begin **construction**
- **Build five stations in parallel**, including charging infrastructure
- Manufacture and progressively deliver **14 electric vessels**
- **Install** ticketing, passenger information and safety systems

Testing, opening and contingency (62-72 months)

- **Complete** integrated **testing** and safety certification
- **Train** crews and conduct trial navigation
- **Run a South Line pilot** before the launch
- **Test** the timetable, accessibility and shuttle connections
- Add the service to the **ATAC Roma app**
- Target **opening by Month 66**, with contingency to Month 72

Indicative benchmarks include Rome's San Teodoro Market PPP (around 15 months from proposal to tender conclusion), London's Barking Riverside Pier (9 months from construction award to opening), and Copenhagen's electric harbour buses (around 2 years for five ferries, charging infrastructure and testing)
These projects differ in scale and scope from TiberConnect

WHY INVEST IN TIBERCONNECT?

1

CLEAR, MEASURABLE MOBILITY NEED

Rome recorded a 45.2% average congestion level and 115 hours lost per driver in rush-hour traffic in 2025

TiberConnect adds transport capacity without adding pressure to Rome's road network

2

DIVERSIFIED & VISIBLE REVENUE MODEL

The proposed PPP model combines public-service payments, fare revenues and performance-based compensation, complemented by advertising, sponsorships, event services and other commercial revenues

TiberConnect reduces reliance on a single revenue source, with additional upside potential

3

DEFINED & MODULAR ASSET BASE

Current estimates identify approximately €17.4M in direct station works and €23.5M in fleet CAPEX

TiberConnect's modular stations and electric vessels allow **phased implementation** with limited irreversible construction

4

STRONG INSTITUTIONAL & POLICY ALIGNMENT

Programma Strategico e Operativo del Tevere identifies the river as a key element of the city's future transformation, linking it to sustainable mobility, ecological transition and urban regeneration

TiberConnect translates this strategic direction into a **concrete mobility service**


THANK YOU FOR YOUR ATTENTION!
Università Bocconi
MILANO
POLITECNICO
MILANO 1863
*AI generated rendering

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