Sustainable Transportation:
The Constraints of An Italian Public University

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Abstract. In Italy most Universities are located in the City Centre, often in ancient buildings that are part of the architectural heritage. During the years they developed campuses in peripheral areas, or even in other cities of the region, thus the concept of "shuttle" takes on a special meaning. The sustainable transportation concerns two main issues: the commuting and the connection between the campuses. In both cases Universities in urban or city centre setting must rely on the services offered by the Municipality to all residents for mobility, and to their sustainable policies, that anyway are required by law. Even though the main problems and solutions do not depend directly on the Universities' policies, the study highlighted some good practices have been produced.

1. Introduction

This paper intends to contribute to the analysis carried on by some Italian Institutions [2,3,4,5,6,7,8,9,10] on the commuting habits of the academic community, to present some good practices, to suggest possible actions, and to provide support for the participation to the UI GreenMetric ranking.

Sustainable mobility is included in SDG 11, target 11.2 of the UN Agenda 2030, that means to ensure access to safe, cheap, accessible and sustainable transport systems, increasing road safety particularly through the enhancement of public transport.

In Italy, the Sustainable Universities Network (RUS), through targeted working groups,

is carrying on several activities for encouraging Italian universities to pursue the objectives of sustainability, and, among these, that of sustainable mobility [1, 11]. The purpose of this short survey is to discuss some aspects of the collected data, with the purpose to envisage possible improvements.

2. The Italian context

In Italy most Universities are located in the City Centre, often in ancient buildings that are part of the architectural and cultural heritage. During the years, in the framework of their development strategies, they established new campuses in peripheral areas, or even in other cities of the region.

Thus, promoting sustainable transportation must take into due account two main issues:
- the commuting
- the connection between the campuses.

Concerning students, another fact needs to be considered. Wherever they live, in the city or suburban areas, in order to favor their integration with the host city, a safe transportation for leisure and social activities, as important as studying and attending lectures, must be granted. This generally clashes with the reduced public transport service in the evening or weekends.

In all cases public Universities in urban or city centre setting must rely on the services offered by the Municipality to all residents for mobility, and to their sustainable policies and strategies, that anyway are required by law. Even though the main problems and solutions do not depend directly on the Universities' policies, some good practices have been produced.

The 2022 report by RUS on mobility of academic community in Italy [11] analyses the data collected through a questionnaire submitted to students and staff of several Institutions and concerns two main areas:
1. The objectives/activities of the Mobility Manager for facilitating the mobility of students and staff while traying to reduce the number of cars;
2. The accessibility, the good transportation and the mobility during the pandemic.

The resulting picture shows that the Italian system, as a whole, is very sensitive to the theme of cars use reduction and shares initiatives and good practices.

These can be summarized as follows:
- Agreements with bus and train companies for reduced fares of public transport in favour of students and staff;
- Carpooling hub platform for sharing cars dedicated to students and staff also with the support of apps;
- Discounts for renting or buying bicycles;
- Agreements with private companies that provide sharing mobility services;
- Buses/lines dedicated to students and employees, for the connection between the university and the city;
- Shuttle services for staff mobility between the campuses;
- Voluntary Travel Behaviour Change promoted by personalized information to encourage people to implement sustainable mobility;
- Reduction of parking sites for discouraging the use of private cars.

Concerning the last item, a recent study on the mobility in Rome [12] highlighted how

the reduced accessibility of private cars pushes the community to use public transportation, but the recent pandemic experience nullified the effects of this good trend. This is a warning to be considered in future plans due to the increasing crisis and emergency situations we are facing.

2.1. Some considerations and examples

In order to plan and adopt a mobility strategy many Italian universities, distributed questionnaires to students and staff to learn about their difficulties in reaching the headquarters and to collect proposals for sustainable mobility solutions.

The analysis of the collected data shows many common points but also differences due to the city size and of the structure and location of the university's premises.
There are three main typologies:
- all buildings/infrastructures located in the city centre, even though with some distance between them;
- core buildings/infrastructures in the city centre and some in the close periphery;
- campuses in the main city centre and in other cities of the region.

Thus, the concept of "commuting" and "shuttle" takes on a particular meaning in each of the above situations. To explain the differences between the three cases we provide an example for each of them.
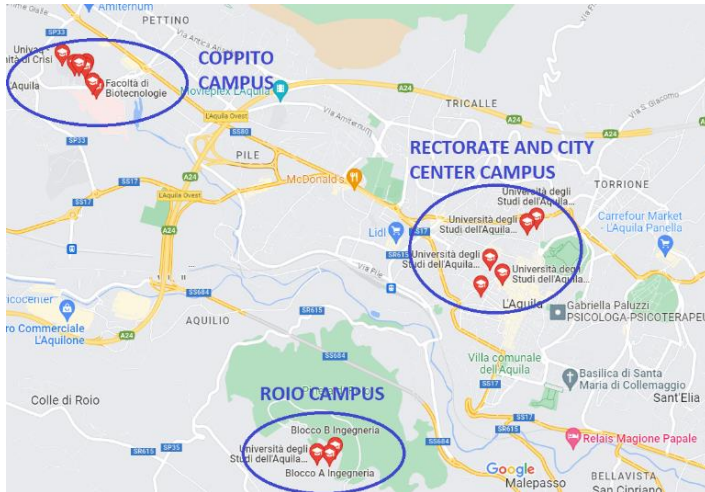
Example 1 – University of L'Aquila

The University of L'Aquila has three main campuses: **City Centre** (Central Administration and Rectorate, Humanities, Economics), **Coppito** (Sciences, including Mathematics, Physics, Chemistry, Computer Science, ICT, Biology, Environmental Sciences, Biotechnologies, Sport Sciences, Medicine, Dentistry and Health Alliances), **Roio** (all fields of Engineering).

Several Buildings in the City centre are monuments, as for instance the seat of the Rectorate,

Figure 1. Palazzo Camponeschi – Rectorate, University of L'Aquila

Average distance campus-city
centre: 3 Kms
Max distance between the
campuses: 8 Kms, Coppito-Roio

Figure 2. The 3 campuses, University of L'Aquila

Promoting actions:
- questionnaire to the academic community to analyse the mobility choices and needs for commuting, submitted twice since the first one provided very limited information;
- agreement with the municipal mobility agency AMA for cost reduction and time extension of the daily service; buses dedicated to the university's campuses

Support services:
- car sharing:
  It is organized on voluntary way mainly by students;
- bicycle sharing:
  It is organized in cooperation with the Municipality:
- reduced parking areas:
  It is a strategic plan of the university for discouraging the use of private cars:
- pedestrian campuses:
  All campuses have the services (student offices, secretary offices, library, Mensa, bar) within their boundaries. All buildings/rooms are at walking distance from each other. Special accessibility frames support disabilities.

Documents:
- First PLAN FOR COMMUTING AND INTERCAMPUS MOBILITY
https://www.univaq.it/include/utilities/blob.php?item=file&table=allegato&id=6243
This Plan has been prepared in 2023 following the analysis of the questionnaire.
The main results concern the unimodal and multimodal strategies adopted by the academic community
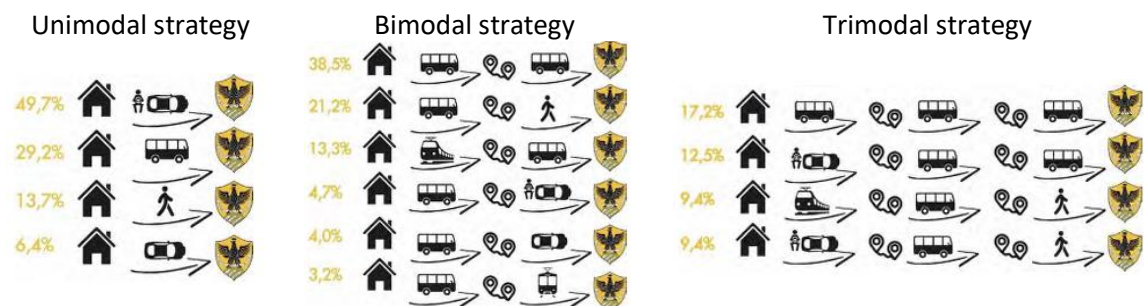

Figure 3.The 3 modalities, University of L'Aquila

The main factors that would increase the number of people moving, at least in part, by walking are the smooth path (59,2%), the personal security (49,6%), being part of a community committed to reduce the environmental impact (38,7%), a greener pedestrian path (30,1%).

The security and the availability of charging stations are the main factors for using electrical bicycles or scooters (more than 68%).

Example 2 – University of Camerino

The UNICAM has the main campuses in **Camerino** and **Mantelica** (about 16 Kms from each other) and other campuses in **Ascoli Piceno**, **San Benedetto del Tronto**, all cities of Marche Region.

MATELICA-CAMERINO Distance: 16,5 Km
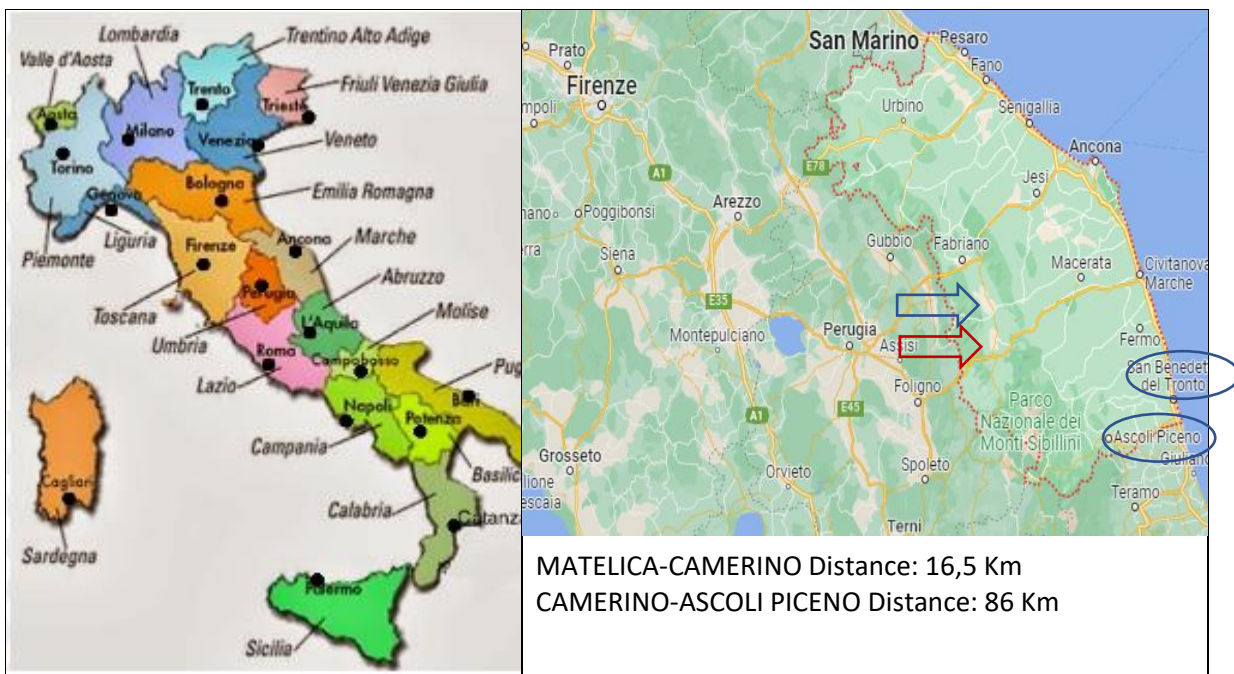CAMERINO-ASCOLI PICENO Distance: 86 Km

Figure 4. The Italian regions, the Marche region

Students come from the whole region of Marche but also from the close Umbria. Students often do not live in the site of the campus where they study but, in several villages/cities within 20/30 Kms. Furthermore, the two main locations Camerino and Matelica need to be well connected.

To meet the mobility needs of students, identified through a questionnaire, the University of Camerino, the Municipality of Camerino, the Municipality of Matelica and Contram Spa, have created the **UNICAM Mobility project.**

Support services:

There are three types of free services (within budget availability) for the student according to their needs:

- urban transport service in the city of Camerino
- extra-urban service between Camerino - Matelica
- urban transport service in the city of Matelica

Plan and strategies:

UNICAMBUS: free bus for #UNICAMstudents!

UNICAM and CON.TR.A.M. Mobility Services have made free direct buses available to

students to reach the University. Long-distance connections are active from Monday to Friday from / to Ascoli, Ancona, San Benedetto del Tronto, Perugia, Terni, Civitanova, Tolentino, Senigallia, Fabriano, Jesi and on Sundays from Ancona.

Example 3 – LUISS Guido Carli

8 structures, including teaching spaces, offices and residences in the centre of Rome (4 in Milan with the Milano Luiss Hub).
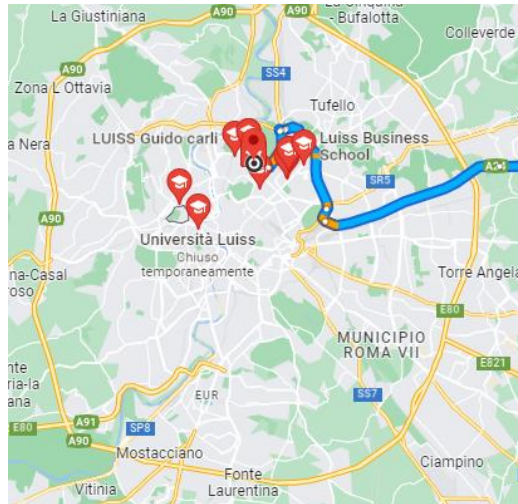

Figure 5. The 8 campuses of LUISS

Even though the distances between the campuses is not big, the city traffic and the parking difficulties require special plans for a sustainable mobility.

The **Luiss Green Mobility** project is the first university pilot project in Europe to provide E-mobility services and related smart services, supported by a management ICT platform with remote control of all the operational functions of the system. The services are offered by Acea Innovation and are dedicated to students, teachers, and administrative staff Luiss:

- Shuttle Service
- Car-sharing

Shuttle Service

The Shuttle Service, managed by Cilia Italia (RATP Development), in partnership with Acea Innnovation, expands the Luiss Green Mobility project with a view to mobility as a service.

ELL - Electric Luiss Link is a highly innovative transport system, also supported by the technology platform ICT, BOMTS with technological declinations properly designed, ecological, collective, integrated and operated by a third operator that provides **5 shuttles, 3 of them gas shuttles and 2 full electricvehicles.**

During the period of greatest activity, each vehicle passes every 10 minutes, while they pass every 20 minutes on Saturdays. The service is available to the whole Luiss community: students, teachers and administrative staff.

The Luiss App, through which you can book your ride, also allows you to check the location of the shuttles and the arrival times at the stop and book a seat on vehicles accessible to people with reduced mobility. The booking confirmation must be made within 5 minutes of the departure of the ride; otherwise, the reservation is cancelled.

Any journey booked and not used must be cancelled before the closure of the booking in the appropriate section "My bookings".

If a user books a seat and fail to use more than 2 bookings, without prior cancellation, it will be impossible for the user to use the service for the following week.

The service is available from Monday to Saturday. For real-time updates on racing electronic poles on the Campus of Via Parenzo and Viale Romania are available. In 2021, an average of 76 journeys per day were made in 2021, with a total amount of saving 3,226.5 kg of CO_2.

Car-sharing

Vehicle Sharing Luiss Green Mobility is a service offered by Acea Innovation and dedicated to students, teachers and administrative staff Luiss.

The available vehicles are Smart fortwo and Smart forfour and can be hired from the charging infrastructure installed at Luiss locations:

- Viale Pola (terrace behind Villa Alberoni)
- Viale Romania (main entrance side near Villa Heritz)
- Via Parenzo (adjacent side garage access)
- Via di Santa Costanza (Library entrance)

Please note that it is possible to finish the rental process at a different location from where the rental started.

Registration for the service consists of two phases:
1. Online registration to the service
2. Formal validation of service registration

The contractual documentation received by mail during registration must be signed and delivered by showing the valid driving licence (original document) to the Luiss offices in charge:

- Students: Supervisory offices in the three Luiss offices
- Teaching and administrative staff: Faculty clerks (2nd floor, Viale Romania - Entrance, Via Parenzo) and General Services Office (Viale Pola).

This service has a cost that depends on the distance to be covered.

These services allow a good implementation of the strategic plans.

Supporting Plans

1. Limited and minimized parking areas for private vehicle to reduce vehicles in campus
2. Using renewable energy for electrical vehicles.

3. Concluding remarks

These examples could help to define a picture about the different approaches needed to promote sustainable mobility in Italian Universities. Besides the compulsory agreements with municipal authorities and decision-making structures, the plans cannot avoid considering issues connected with the infrastructures, distances, funds availability, the size of the university and of the city and the general perception of security.

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