# Sustainable Urban Transport in Italy

This Factsheet examines the issue of **sustainable transport** in two of Italy's most famous cultural centres, Florence and Bologna. Florence is located in Tuscany and Bologna in Emilia-Romagna. Both cities are popular destinations for tourists from all over the world.

Fig 1. Location map showing case studies

Florence has a population of 480,000 and Bologna 430,000. Both cities share similar problems in coping with transport, often as a direct result of the unique cultural and historic nature of their built environments (Fig 2)

Fig 2. Transport management problems in Florence and Bologna.
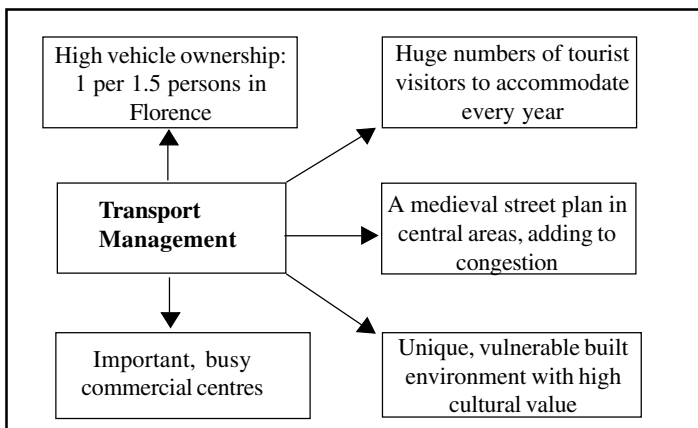
Florence and other city centres such as Siena, Verona and Naples have achieved **World Heritage Site** status under the 1972 UNESCO Convention. This fact in itself makes transport management all the more difficult.

World Heritage status recognises a building or area as having outstanding cultural or natural value to the whole world, not just the country it happens to be in. Designation as a World Heritage Site brings status and interest, but also a duty to **protect and conserve.**

Florence and Bologna both face the same conflicting needs to:
- Accommodate large numbers of visitors
- Maintain the cities as commercial centres for residents
- Protect cultural heritage from damage by visitors, traffic and air pollution.

Italy's major tourist areas have suffered from the general increase in **mobility** in MEDCs over the last few decades. As a whole the country has 32.5 million cars, almost double the 17.7 figure for 1980. (Fig 3). Whilst passenger kilometres per year have almost doubled in the 20 year period, almost all of the increase has been due to car use.

Fig 3. Passenger Transport in Italy 1980-2000
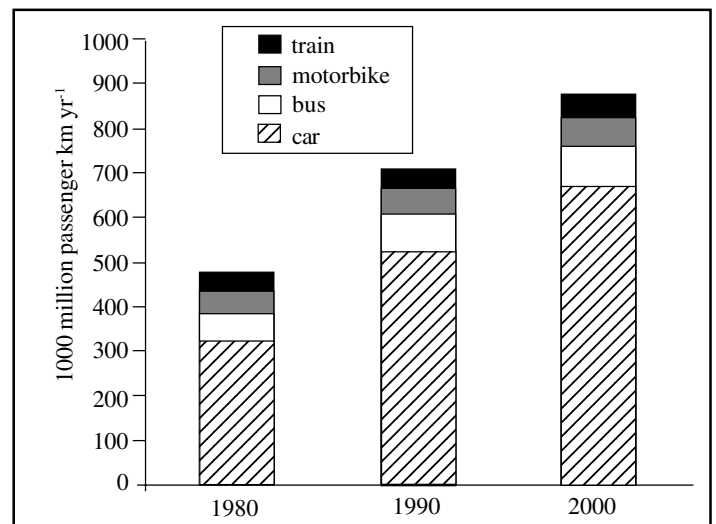
Similar trends in transport use can be found throughout the EU and in other MEDCs. Many cities have found the growth in motor vehicle traffic inside historic city centres unsustainable in terms of people's **quality of life**, **health** and the **local economy**. Hugely congested and polluted cities will tend to deter visitors and this has a knock-on effect for the health of the economy.

Not all cities are the same however. The **'modal split'** of transport use for four cities is shown below. This clearly shows that some cities are more car-oriented than others.

Table 1. % of journeys by transport type for 4 European cities

% (2000)	Public Transport	Car	Bicycle	Walking
Bologna	28	40	12	20
Florence	21	34	24	21
Edinburgh	34	50	4	12
Lyons	14	53	1	32

Sustainable Development:
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs
*(Brundtland, 1987)*

Many Italian and other MEDC city planners are now tackling the issue of sustainable transport :

- Use low emission vehicles, to **reduce** urban and global air pollution.
- Be accessible to all members of a **community**, both in terms of cost and physical access.
- Use Integrated Transport principles, which allow easy transfer from one form of transport to another (for instance bus, trains and trams at the same interchange).
- Be clean, efficient and safe.

Most European transport planning focuses on reducing **car dependency**. Cars are energy expensive, as well as pollution and congestion generating. (Fig 4).

Fig 4 shows how single occupancy cars produce the most pollution per person, per kilometre, whereas public transport is much less polluting. In 1998, 18 Italian and 25 other European cities signed the **Florence Declaration on Alternative Traffic in Towns**. Essentially this committed the cities to work towards lowering transport emissions, by focussing future infrastructure developments on **low or zero emissions vehicles**. Examples of these and other strategies are outlined in Case Study 2.

**Fig 4: Carbon dioxide emissions by transport type**
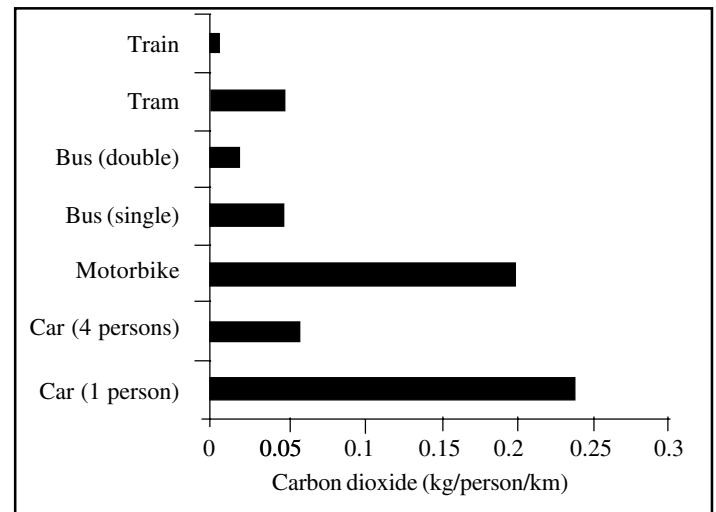
Case Study 1: Bologna, in the central region of Emilia-Romagna has a population of 430,000. It was the first large Italian urban area to introduce a radical approach to transport planning.
Characteristics of the urban area are:
- *75,000 resident population in central area.*
- *75,000 working population in central area.*
- *Medieval walls surround the central area, which has many narrow streets.*
- *Historic centre is surrounded by a 4-lane ring road.*

In 1984, 70% of the population in Bologna voted in favour of restricting private car use in the historic centre. Bologna's local government responded to this vote with a range of measures to manage transport, which have been copied elsewhere (Fig 5).

Fig 5. Transport Management in Bologna
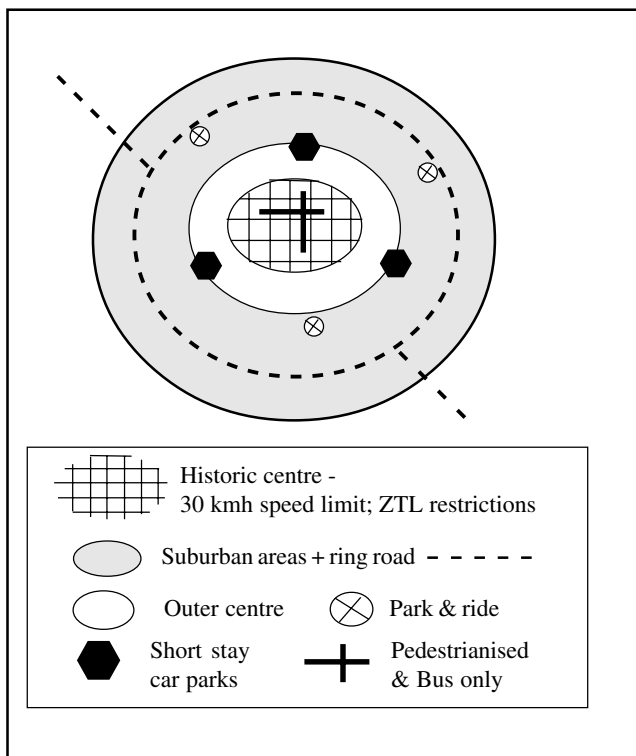
The key policy adopted by Bologna was the creation in 1989 of a ZTL (zona a traffico limitato) covering the whole historic centre. The ZTL has several features:
- *From 7am to 8pm no private cars are allowed in.*
- *Permits allow resident's cars, delivery vehicles and public transport vehicles to enter.*
- *Parking is restricted to residents and businesses.*

The ZTL might be described as the 'stick' in Bologna's transport management plan, the 'carrots' are:
- *Visitors and tourists are mainly favourably affected by the ZTL and enjoy their visits more, and spend more*
- *The centre has become safer & cleaner, and large areas are now pedestrianised (called a 'zona blu').*
- *Bus services have improved.*
- *Park & Ride schemes have been implemented.*

Local government in Bologna reported a drop in the number of vehicles entering the historic centre daily from 152,000 in 1981 to 58,000 in 1989 – a dramatic fall of 62%. These figures would seem to suggest the scheme has worked. However as Fig 6 shows even though the number of residents in Bologna has fallen recently (due to counter-urbanisation) the total number of vehicles moving through the city as a whole continues to rise.

Fig 6. Population and daily vehicle movement change 1987-1997
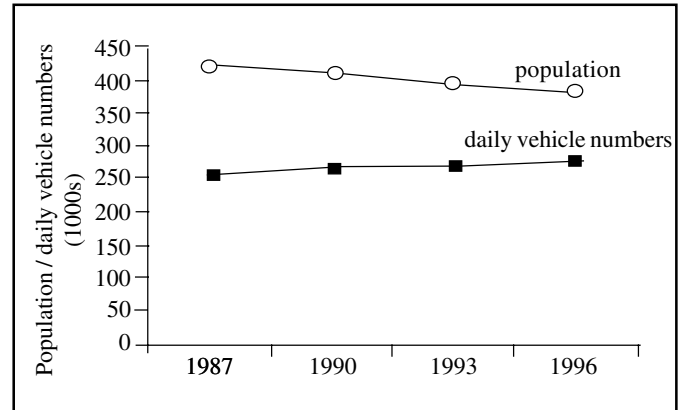
Conclusion
Bologna's bold move in 1984 has clearly moved it towards a more sustainable historic central area. Local people have benefited from improved public transport and a cleaner, safer central area. However as Fig 6 shows, the pressure on the wider urban area continues to grow as vehicle numbers rise.

Case Study 2: Florence

Florence has a population of 480,000 and a very high rate of vehicle ownership of 1 vehicle per 1.5 people. *Florence City Council, the local public transport company (ATAF) and the EU have worked together on a number of transport issues with the aim of reducing pollution and congestion in the historic centre*

Many of the schemes implemented by Florence have been part of the wider JUPITER 1 and 2 EU Projects. Since the early 1990s these projects have pioneered radical schemes to reduce pollution and congestion in European Cities.

'Personalbus'; this is a 'dial-a-bus' service with 200 dedicated stops. Introduced in 1997 it now carries up to 13,000 passengers per month.

64 full size buses running on natural gas (low emission); these are used on longer routes that cross the city centre.

26 electric minibuses with zero emissions, and a capacity of 27 passengers each. These run on 3 routes through the historic centre, with a further route running eco-diesel minibuses.

2 large reception areas for tourist cars and coaches allow park-and ride facilities into the central area.

Map legend:
- Major roads
- ZTL -limited traffic zone
- Pedestrianised zones
- (R) Railway station
- ● Car parks outside ZTL

Fortezza da Basso
River Arno
Plazza Del Duomo
Uffizi
Santa Croce
River Arno
Pitti Palace

Taxi Sharing: In 2002, 200 taxis were licensed to carry more than 1 person.

The largest investment, begun in 1999 is the Trams Project. The 7.5km electric tramline will link Florence Railway station to its airport and may be extended citywide in future years.

Florence's ZTL limits traffic and parking, and bans it from pedestrianised areas. Car parks are provided outside the historic zone and link up with buses travelling into the historic area.

The planned construction of 45km of paths and cycle routes to complement the 6500 bicycle parking places already in place

Florence's new transport system has come at a price
- 2 tourist coach reception areas - £2.8 million
- Improving disabled access in the historic centre - £1.8 million
- Jupiter 1 & 2 funding - £2.3 million
- Trams Project investment - £85 million

There is evidence that emissions have been reduced,though there are still problems. 40-50% of Florence's hydrocarbon emissions are produced by motorbikes and scooters, and these are proving hard to control

Conclusion

Public transport is very noticeable in Florence. Major investment has produced a system which is easy to use and low cost. Some approximate costs are given below:
- Bus ticket valid for 1 hour – 60p
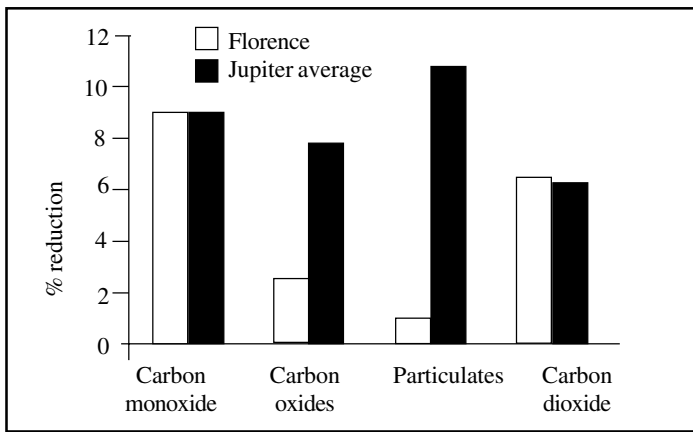- 24hr bus ticket - £2:30
- 'Park-and-ride' parking - £1

Conclusion: A model for urban transport planning?
The approach taken by many Italian cities has three inter-linked strands:

- **PHYSICAL RESTRICTION:** Reduction in vehicle use and emissions by imposing restrictions on use (ZTL areas, pedestrianisation).
- **MODAL SWITCHING:** Increase in public transport use by improving existing provision (electric and gas buses, taxis, park and ride systems)
- **TECHNOLOGICAL:** Increase in public transport use through investment in innovative new systems (Trams, 'Personalbus')

There is evidence that traffic volume has fallen in cities such as Bologna, and some evidence that emissions are being reduced in Florence (see Fig 7) and other cities where **EU Jupiter** funding has helped improve the transport system. Some aspects of the Italian policies are controversial and complex. In Florence you cannot drive into the **zona blu** (pedestrianised area) during the working week, but you can on Sundays. Similarly, many parking spaces in central areas are for residents only and visitors need to be aware which ones they are, and how they are marked.

Fig 7: Percentage reduction in emissions 1993-2000 Florence –v – 'Jupiter' Cities average.

> *Exam Hint: Examine Fig 7, which shows reductions in emissions in Florence. If you were set a target of reducing emissions by a further 10% over 5 years, how might you achieve it? You could note down the benefits and costs of different strategies.*

Similar policy initiatives can be found in other Italian cities such as Pisa. Other cities, like London, have taken a different approach with the recent introduction of the **£5 Congestion Charge**. Arguably a policy such as this, that focuses on **physical restriction**, needs to be supported by strategies to encourage **modal switching** and new **technologies**, if it is to persuade people to reduce technologies.

Exam Questions

1. Define the term 'sustainable transport'. *(2 marks)*
2. With reference to specific examples, examine how transport in urban areas can be made more sustainable. *(10 marks)*
3. Suggest reasons why many large urban areas are experiencing transport problems. *(8 marks)*

Answer Guidelines

1. Sustainable transport involves strategies that reduce transport related pollution levels, use energy resources more efficiently and improve quality of life for communities through better health and habitation conditions. It involves strategies to limit car use whilst promoting alternative, cleaner, forms of transport. (both public and private)

2. Start with a definition of sustainable transport. A good structure here would be to use the 3 approaches to sustainable transport outlined in the conclusion – Physical Restriction, Modal Switching and Technological. Florence and Bologna both provide examples of the 3 approaches, and you may know of other examples from your studies. To 'examine' the issues you could use a table format to explore the advantages and disadvantages of each strategy:

More detail could be added, and a good answer would provide a conclusion which states which strategy (or combination of strategies) is most likely to reduce pollution, use less energy and improve quality of life. Evidence of transport and infrastructure costs in Florence, plus declining pollution levels, could be used to bolster your case.

	Advantages	*Disadvantages*
Physical Restriction London's congestion charge	Profits invested in improving public transport. Reduces congestion and pollution.	Criticised by public and businesses. High cost to user of £5.
Modal Switching Bus system in Florence	Uses existing infrastructure. Relatively low cost of new electric/gas buses.	Even low emission buses still pollute. Safety issues in pedestrianised centre.
Technological Personalbus in Florence	Flexible system, individuals can call for a bus. Useful for the mobility restricted.	High cost. Problems of matching demand to supply of buses.

3. Car ownership levels and transport use in general continues to rise, despite some recent falls in urban population due to counter-urbanisation. Typically 30-60% of journeys in cities are made be car. This type of transport is inefficient, with cars using 2500-3000 kilojoules of energy per person per kilometre (trains use around 550 Kj/per/km). Inefficient transport pollutes. Many urban areas face serious air pollution problems with high levels of Nitrogen oxides, hydrocarbons and particulate matter. Air pollution contributes to poor health, particularly leading to respiratory problems in children and the elderly. In Italy the number of cars has doubled to over 32 million in the last 2 decades, whilst the contribution of public transport has remained static or declined. Many urban areas have ageing transport infrastructure and even older street layouts. This combined with increasing volumes of traffic leads to congestion, which in turn increases pollution. The cost of upgrading transport systems with new technology is often very high and existing street patterns and buildings restrict what can be done. The popularity of the car is likely to increase, unless restrictions are placed on its use and / or people are encouraged to switch to alternative forms of transport.

A further key point is **urban sprawl**
As cities not only grow in size but in area extent, the length of journeys to work increases. The mixed zone structures of many cities means that many cross city journeys are necessary each day, for example from the suburban fringe to the CBD, or the counter direction from inner city to suburban industrial estate or retail park

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