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# Contents

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<b>1</b>	<b>Abstract .....</b>	<b>4</b>
<b>2</b>	<b>Summary of final report .....</b>	<b>5</b>
2.1	Objectives .....	5
2.2	Activities .....	5
2.2.1	The pilot projects in Bethlehem .....	5
2.2.2	The benchmarking exercise .....	6
2.3	Results achieved .....	8
2.3.1	The pilot projects in the city of Bethlehem .....	8
2.3.2	The benchmarking .....	10
2.4	Conclusion .....	11
<b>3</b>	<b>Consolidated scientific report .....</b>	<b>12</b>
3.1	Objectives .....	12
3.2	Activities .....	13
3.2.1	The pilot projects in Bethlehem .....	13
3.2.2	The benchmarking .....	14
3.2.3	The final conference .....	21
3.3	Results achieved .....	22
3.3.1	The Pilot projects in the city of Bethlehem .....	22
3.3.2	The benchmarking .....	26
3.4	Problems encountered .....	27
3.5	Technology implementation plan .....	28
3.6	Conclusion .....	28
<b>4</b>	<b>Management report .....</b>	<b>29</b>
<b>5</b>	<b>Completed catalogue page .....</b>	<b>30</b>
5.1	Summary .....	30
5.2	Results achieved .....	30

# 1 Abstract

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The countries of the Mediterranean area, North Africa and the Middle East have a historic, cultural and natural patrimony constituting an extraordinary tourist attraction and, therefore, potential source of economic development. However, the inadequacy of some parts of the transport system is a stumbling block.

The EMERET project aimed at improving, in the direction of a greater sustainability and interoperability, the efficiency and effectiveness of the transport systems of the tourist areas of the Mediterranean countries, by transferring to those contexts transport measures successfully implemented in European cities

A benchmarking exercise was carried out, taking into account the results of European research projects, in order to identify the principal problems and possible solutions for the transport systems of the above-mentioned areas. The major differences were that in the Middle East cities there is a higher number of accidents, injured people and fatalities, a lack of areas reserved to pedestrians, unsafe walking conditions, and finally a very poor user perception of transport system externalities.

Special attention was focused on the transport system of Bethlehem city (Palestinian Authority), which constituted the main project test site. Three pilot projects were defined for the city of Bethlehem in order to rationalise the use of the space between motorised modes, public transport, and pedestrians, to improve safety and to reduce traffic nuisance in sensitive areas.

## **2 Summary of final report**

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### **2.1 Objectives**

The EMERET project derived from a desire to contribute to the improvement, in the direction of a greater sustainability and interoperability, of the efficiency and efficacy of the systems of regional and local transport of the Mediterranean countries, with particular attention to the areas of greatest interest for tourism.

Specific objectives of the EMERET project were:

- to verify the transferability of the innovative measures and methodologies experimented with in the European cities in significantly different contexts, such as those of the third countries of the Mediterranean;
- to define a pilot project in the city of Bethlehem, on the bases of the above-mentioned experiences and a detailed analysis of the local problems;
- to identify a network of Mediterranean cities of particular interest for tourism in European and third countries.

An important objective of the EMERET project was, by forming a network, to lay the groundwork for the creation of a consortium of collaborating MED and EU cities. This consortium would thus already be in place for subsequent EC actions (“shared cost”) aimed at the diffusion in the third countries of both decision support systems for planning and evaluation models of the results of the transport-related measures on the socio-economic activities and on the environment. In other words, the EMERET network represents a significant head-start on future initiatives.

### **2.2 Activities**

The activities carried out during the project can be divided into three groups:

1. analysis of the problems of the Bethlehem transport system and definition of the pilot projects;
2. creation of the network of cities and benchmarking of their transport systems;
3. preparation of the final seminar.

A Web site for the project was also created ([www.itroma.com/projects/emeret](http://www.itroma.com/projects/emeret)).

#### **2.2.1 The pilot projects in Bethlehem**

The first step towards the definition of the pilot projects was the analysis of the transport problems in Bethlehem. On the basis of this analysis the following objectives were identified:

- to rationalise use of the space between motorised modes, public transport and pedestrians;

- to improve safety;
- to reduce traffic nuisance in sensitive areas.

The next step was to identify the best measures, among those successfully implemented in the framework of the European Commission transport research programme, for pursuing the above-mentioned objectives. The result of these activities was the identification of the following possible interventions, subjects of the three pilot projects to be implemented in the city of Bethlehem:

- reorganisation of the public transport system, at present completely fragmented, utilising the new bus station as interchange and integration node;
- reorganisation of the parking system, with fees charged in some commercial streets;
- pedestrianisation of some streets of tourist interest.

For each pilot project a selection of possible sites was made. On the basis of the collected information, different alternatives were compared to identify the best solution. Accompanying measures were then defined to increase the effectiveness of the proposed measures.

Unfortunately, the present situation of violent conflict in Palestine, and specifically in Bethlehem, has impeded the development of the planned pilot project activities.

### **2.2.2 The benchmarking exercise**

One specific objective of EMERET was to verify the transferability of the innovative measures and methodologies experimented with in European cities in significantly different contexts, such as those of the third countries of the Mediterranean.

In line with this objective, benchmarking was carried out in order to:

- assess the present condition of the transport systems;
- identify possibilities for improvement;
- identify how to obtain improvements.

A peculiar aspect of this benchmarking exercise was the comparison of the transport systems of cities, all of interest to tourists, in two different political, social, cultural and religious contexts, namely, Mediterranean partners and EU members.

In order to try to identify possible solutions to the Mediterranean cities' transport problems, European cities that have experimented with particularly innovative and sustainable urban and regional transport systems were used as a reference model (best practice examples). Orvieto and Évora (the two European cities involved in the project) had participated in several European research projects, testing and implementing innovative features in terms of sustainability of the public transport modes (funicular, escalators, electric buses) and in terms of measures of restriction of the use of private vehicles.

The benchmarking exercise provided a broader picture of some typical problems of the Mediterranean cities.

Finally, a main aim of the EMERET project was to establish a network of political and scientific contacts for a future enlargement of the European/Mediterranean cities benchmarking exercise.

The methodology consisted of the following steps:

1. selection of the cities to benchmark;
2. identification of the indicators (items to be compared);
3. data collection and analysis;
4. data comparison and identification of problems and gaps.

The objective of the selection of the was a network of contacts in the municipal transport departments of five or six Mediterranean cities for the short-term purpose of formulating a technical profile of each city's transport situation and, in general, exchanging information on urban transport, especially in relation to tourism.

The criteria for the selection of the cities were:

1. location around the Mediterranean in a mix of EU member and Mediterranean partner countries;
2. a population between 20,000 and 100,000 inhabitants;
3. actual or potential tourist destinations.

The network included two European cities and three Mediterranean partner country cities:

Bethlehem, Palestinian Authority (25,000)

Évora, Portugal (48,000)

Jerash, Jordan (45,000)

Orvieto, Italy (20,700)

Valletta, Malta (7,600)

Although Valletta's population is well under our preferred minimum, it is Malta's most populous city (and is the capital).

The next step in the benchmarking was the identification of indicators that provide a concise but significant description of the transport system features. This step was critical because the indicators set the limits to the level of in-depth analysis that can be made. We referred to three EC funded projects in the transport field (DG VII, the present DG TREN – Energy and Transport):

1. the Citizens' Network Benchmarking Initiative pilot project (1999);
2. the Citizens' Network Benchmarking Initiative full project (2001–02);

### 3. MAESTRO (1998–99).

In the first two projects ITr<sup>1</sup> participated as project manager for the city of Terni; DITS participated extensively in the third.

Through an iterative process, taking into account both the need of data for a detailed analysis and the actual possibility of collect them, a comprehensive questionnaire was drafted and circulated.

The questionnaire consisted of 15 indicators and 35 questions (Annex C, Deliverable 2) grouped into five sections (General information, Transport modes, Social impacts, How the situation is perceived).

Data collection was long and difficult. By offering an honorarium, we were able to establish contact with local experts in the municipalities willing to take responsibility for completing our questionnaire and providing other requested information. Data received from the local contacts had to be evaluated for reliability and consistency. Site visits to Bethlehem, Jerash, and Orvieto, to gather additional information about local transport systems, allowed us: to have a first-hand look at the transport systems, its infrastructures and services; to collect, if possible, further data (in Jerash we assembled a panel to answer the questions of the section “How the situation is perceived”); to check the correctness and reliability of data provided in the questionnaire.

Thanks to the large amount of resources dedicated to the data collection activities, nearly all of the information requested through the questionnaires was made available. Only in a very few cases were any data missing, either because the information did not exist at all or because it is collected in different ways from city to city. These differences did not, however, affect the quality of the results.

The comparison of data concerning the same indicator was often very difficult, because the cities use different definitions. We chose population as standardisation factor for data.

Afterwards data were processed in order to identify possible differences and gaps. The small number of cities does not allow a statistical analysis, but rather a qualitative one with quantitative data.

## 2.3 Results achieved

### 2.3.1 *The pilot projects in the city of Bethlehem*

#### *Pilot project 1: the pedestrianisation of Star Street*

The streets of the old city are narrow, steep and tortuous; some have heavy pedestrian traffic during the day, some do not. In both cases there are problems of compatibility with cars. In the first case car traffic, illegal parking and tolerant police mean difficult circulation for pedestrians. In the second case, car traffic, often too fast for these streets without pavements, means safety problem and a feeling of danger for the few pedestrians.

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<sup>1</sup> DITS is the Department of Hydraulics, Transport and Roads of the University of Rome “La Sapienza”. ITr is I.T. Ingegneria dei Trasporti S.r.l.



To develop pedestrian streets in the historic centre, the study examined the possible candidates and compared the pros and cons of each with these main objectives:

- improving walking conditions and safety;
- encouraging tourists to discover the town's heritage on foot.

After comparison of the pros and cons of each possible alternative, a part of Star Street was chosen as the first pilot project site. But to be effective it needed to define different kinds of accompanying measures:

- the physical barrier to close the street;
- the choice of the closing period;
- the authorisations during the closing period for emergencies, for people with reduced mobility or for special situations (loading and unloading for construction);
- the reduction of speed during the opening hours;
- the improvement of accessibility from outside.

#### ***Pilot project 2: the pay parking on Paul VI Street***

This second pilot project is aimed at testing on-street parking with fee. The chosen site is part of the crowded and chaotic Paul VI Street.

The measures to be implemented are:

- bollards to delimit the slots and prevent illegal parking on the pavement and double parking;
- a fee (suggested \$1.00 per hour) for short-term parking with some slots always available, leaving long-term parking to the parking area and side streets;
- a fee collected manually by a couple of people in the morning and another couple in the afternoon;
- fee period only during the crowded hours from 08:00 to 13:00 and from 15:00 to 19:00.

#### ***Pilot project 3: the enhancement of the new station***

The new bus station is centrally located, near the old centre, the commercial area, and the tourist attractions. The station provides parking for 20 buses or 60 taxis on the ground floor, for 17 buses on the first floor, for 30 buses on the second and third floors. The tourist buses have three reserved slots on the second floor. The aim of pilot project 3 is to test the effect of a preliminary integration of different public transport services in the new station. Short-distance public transport, park-and-ride passengers and passenger accompanied by driver ("kiss and ride") can easily connect with long-distance public transport.

The measures to be implemented in third pilot project are, in order of priority:

- moving to the new bus station a first selected group of short- and long-distance public transport, both buses, minibuses and taxis;
- timetable coordination between short- and long-distance public transport;
- fare integration with the creation of a zone-based fare system.

The final goal is the realisation of an integrated public transport system with the new station acting as a transit centre.

### **2.3.2 The benchmarking**

The benchmarking carried out during the EMERET project has produced several results.

A network of Mediterranean partner and European member country cities has been created and local contact persons identified. The members of this network can now exchange information and good practices on transport system issues. The cities involved in this benchmarking exercise should constitute the nucleus of a lasting consortium of European and Mediterranean cities and research centres to be involved in future EC actions aimed at encouraging sustainable development around the Mediterranean basin in a spirit of collaboration.

Through this benchmarking exercise a comparison has been made between two typical European cities (Orvieto and Évora), two typical Middle East cities (Bethlehem and Jerash), and one city (Valletta) with a peculiar geographical location (Malta was a Mediterranean partner country when the project began, but has now become a pre-accession country).

Comparison of the five transport systems permitted identification of some differences between European members and Mediterranean partner country cities:

- the number of vehicles per head is much higher in the EU cities;
- motorcycles and mopeds are practically absent in the MED cities;
- in the MED cities the number of taxis per 1,000 residents is higher than in the EU cities; shared taxis are widely used;
- the length of the PT route per resident in the MED cities is much shorter than in the EU cities;
- the two Middle East cities cannot provide local transport information on the Web, although in Bethlehem transport information is available in many languages;
- both MED and EU cities perceive air pollution and congestion as a serious problem, noise and visual intrusion are perceived as serious problems in the MED cities;
- in the MED cities trucks and vans are viewed as contributing significantly more to the local air pollution than in the EU cities;

and finally, a very important result:

- more accidents per 1,000 residents occur in the MED cities, with a much higher rate of injuries and deaths than in the EU cities.

## **2.4 Conclusion**

The differences and gaps that emerged in the benchmarking exercise highlighted possible fields of interventions to improve efficiency and effectiveness of transport systems in the Mediterranean cities.

The lack of areas reserved to pedestrians and the unsafe walking conditions are one of the main issues highlighted by the benchmarking exercise and confirmed during the site visit in Jerash (we saw people walking in the city centre in the street beside the pavement, because it was too narrow and high and was clogged with goods displayed by shopkeepers; in the most crowded part of the city centre people walked in the road between cars). Other important differences identified through the benchmarking include the number of accidents per resident and their gravity and the very poor user perception of transport systems. The difference in the number of accidents is less notable than the difference in the number of injured people and fatalities. An in-depth analysis should be carried out to understand the reasons for this difference. Finally, in the MED cities there is a very poor user perception of transport system externalities, especially noise, visual intrusion, congestion and air pollution (EU cities also perceive the last two as a serious problem).

The five cities involved can constitute the nucleus of a network of European and Mediterranean cities, oriented to the exchange of information on transport systems and best practices. This sharing of scientific and technological experiences between EU organisations and those of the Mediterranean countries can, in future, be extended to other fields.

The three pilot projects provided information useful to the creation of a traffic policy in Bethlehem that could be both effective and acceptable to the public. Unfortunately, because of the conflict in Palestine, it was not possible to implement and test the measures defined and already tested in the European cities, and to evaluate their efficacy in a completely different socio-economic, cultural, and religious context.

## 3 Consolidated scientific report

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### 3.1 Objectives

A crucial factor for the socio-economic development of the so-called developing countries is surely represented by the improvement of the efficacy and efficiency of the transport systems.

More efficacious transport systems, with greater interoperability, at the level of both international and regional or local links, can provide greater trip ease for persons and freight. Such improvement can also offer a strong stimulus to economic activities, such as tourism, which can represent a strategic key for development.

This is the case of those countries of the Mediterranean area, North Africa and the Middle East whose historic, cultural and natural patrimony constitutes an extraordinary tourist attraction and, therefore, source of economic development. However, the inadequacy of some parts of the transport system is a stumbling block.

Furthermore, the growth of tourism has, in recent years, led to the chaotic development of the private and public transport systems (for example, traffic flows often incompatible with road networks laid out centuries ago, deregulated public transport systems without forms of co-ordination), with consequent negative effects on the sustainability of mobility and on the residents' quality of life.

The EMERET project derived from a desire to contribute to the improvement, in the direction of a greater sustainability and interoperability, of the efficiency and efficacy of the systems of regional and local transport of the Mediterranean countries, with particular attention to the areas of greatest interest for tourism.

A benchmarking exercise, involving cities in Mediterranean Partner countries (MED) and European (EU) cities with common features in terms of tourist attraction, was carried out to identify the principal problems of the transport system. The cities involved were Bethlehem (Palestinian Authority), Évora (Portugal), Jerash (Jordan), Orvieto (Italy), and Valletta, (Malta).

In preparation for the project, exchanges of experiences were launched. These took the form of on-site visits between the cities of Bethlehem and Orvieto. Orvieto's transport network, thanks in part to participation in European research projects, has innovative features in terms of sustainability of the modes of public transport (funicular, escalators, electric buses) and in terms of measures of restriction of the use of private vehicles. The experiences of Évora were also taken into in consideration.

Specific objectives of the EMERET project were:

- to verify the transferability of the innovative measures and methodologies tried in the European cities, in such significantly different contexts as those of the third countries of the Mediterranean. This represents a particularly innovative aspect of the project. Use was made of the results of European projects, such as MIMIC (Mobility InterModality and InterChanges, DG VII), CAPTURE (Cars to Public Transport in the Urban

Environment, DG VII) and Citizens' Network Benchmarking Initiative pilot (DG VII) and full (DG TREN) projects;

- to define pilot projects in the city of Bethlehem, on the basis of the above-mentioned experiences and of a detailed analysis of the local problems. To this end, the methodology for the evaluation of the pilot projects developed within the European project MAESTRO (Monitoring, Assessment and Evaluation Scheme for TRansport policy Options in Europe, DG VII) was used;
- to identify a network of European cities and of the third countries of the Mediterranean of particular interest for tourism. The first, with Orvieto, constituted reference models. The second group contributed to providing a broader picture of the typical problems of those areas and are possible sites for further pilot projects;
- to organise a final seminar for presentation of the project results.

### **3.2 Activities**

The activities carried out during the project can be divided into three groups:

1. analysis of the problems of the Bethlehem transport system and definition of the pilot projects;
2. creation of the network of cities and benchmarking of their transport systems;
3. preparation of the final seminar.

A project Web site was also created ([www.itroma.com/projects/emeret](http://www.itroma.com/projects/emeret)) from which it is possible to download files containing a project summary in French and English and the questionnaire. Other information and documents will be loaded when endorsed by the European Commission.

#### **3.2.1 The pilot projects in Bethlehem**

The first step towards the definition of the pilot projects was the analysis of the transport problems in Bethlehem. On the basis of this analysis the following objectives were identified:

- to rationalise use of the space between motorised modes, public transport, and pedestrians;
- to improve safety;
- to reduce traffic nuisance in sensitive areas.

The next step was to identify the best measures, among those successfully implemented in the framework of the European Commission transport research programme, for pursuing the above-mentioned objectives. The result of these activities was the identification of the following possible interventions, subjects of the three pilot projects to be implemented in the city of Bethlehem:

- reorganisation of the public transport system, at present completely fragmented, utilising the new bus station as interchange and integration node;
- reorganisation of the parking system, with fees charged in some commercial streets;
- pedestrianisation of some streets of tourist interest.

For each pilot project a selection of possible sites was made. On the basis of the collected information, different alternatives were compared to identify the best solution. Accompanying measures to increase the effectiveness of the proposed measures were then defined.

Unfortunately, the present situation of violent conflict in Palestine, and specifically in Bethlehem, has impeded the development of the planned pilot project activities.

### **3.2.2 The benchmarking**

#### **Objectives**

One specific objective of EMERET was to verify the transferability of the innovative measures and methodologies experimented with in European cities in significantly different contexts, such as those of the third countries of the Mediterranean.

In line with this objective, benchmarking was carried out in order to:

- assess the present condition of the transport systems;
- identify possibilities for improvement;
- identify how to obtain improvements.

A benchmarking process permits better understanding of the present condition of a city's transport systems by encouraging the creation or development of a database of useful information on it. It also allows a city, through the comparison with different realities, not only to identify possible gaps and set goals, but also to understand how these goals can be accomplished by exchanging information and experiences.

A peculiar aspect of this benchmarking exercise was the comparison of the transport systems of cities, all of interest to tourists, in two different political, social, cultural and religious contexts, namely, Mediterranean partners and EU members.

In order to try to identify possible solutions to the Mediterranean cities' transport problems, European cities that have experimented with particularly innovative and sustainable urban and regional transport systems were used as a reference model (best practice examples). Orvieto and Évora (the two European cities involved in the project) had participated in several European research projects, testing and implementing innovative features in terms of sustainability of the public transport modes (funicular, escalators, electric buses) and in terms of measures of restriction of the use of private vehicles.

The benchmarking exercise provided a broader picture of some typical problems of the Mediterranean cities.

Finally, a main aim of the EMERET project was to establish a network of political and scientific contacts for a future enlargement of the European/Mediterranean cities benchmarking exercise.

## **Methodology**

The methodology consisted of the following steps:

1. selection of the cities to benchmark;
2. identification of the indicators (items to be compared);
3. data collection and analysis;
4. data comparison and identification of problems and gaps;
5. plan and design of possible corrective actions (carried out for the pilot project in Bethlehem).

In this section the first four steps will be described. The fifth, the subject of the pilot projects in Bethlehem, was presented in project Deliverable 1. The section concludes with a brief account of the difficulties encountered along the way.

The benchmarking exercise is the subject of Deliverable 2 “Benchmarking of data from the cities of Bethlehem, Jerash, Valletta, Évora and Orvieto”.

## **Selection of the cities**

The first and fundamental step for carrying out the benchmarking exercise was the creation of a network of European and Mediterranean cities. For a number of reasons this was much more difficult and time-consuming than expected.

The objective was a network of contacts in the municipal transport departments of five or six Mediterranean cities for the short-term purpose of formulating a technical profile of each city’s transport situation and, in general, exchanging information on urban transport, especially in relation to tourism.

***The criteria.*** Cities to be included in the network were required to:

- be in a Mediterranean country, for a mix of EU member and Mediterranean partner countries;
- have a population between 20,000 and 100,000 inhabitants;
- be an actual or potential tourist destinations.

For the EU member countries, “Mediterranean” was interpreted loosely to allow, if need be, inclusion of, say, inland or even Atlantic cities of Mediterranean countries (such as France and Morocco, though this came to nothing) and to include Portugal. There could be no more than one city per country and the European cities chosen were required to have a record of some innovation in mobility.

The population size considered most desirable was around 20,000 to 25,000, that is, comparable to Orvieto and Bethlehem, the first cities to join the network. The permissible range, however, was set at 20,000 to 100,000.

The third criterion, tourist interest, is in line with the aim of encouraging economic development by the exploitation of cities' natural and cultural heritage. A more efficacious and usable transport system would make the cities more attractive as tourist destinations and would also foster other economic activities as well.

The idea of the network had, in fact, grown out of the successful collaboration of members of the project working group (from DITS and ITr) with the city of Orvieto on "alternative mobility". The city administration, already active internationally, was eager to form a network of Mediterranean cities with characteristics similar to its own. Orvieto, famously, contains a historic centre set on a delicate tufa outcropping. Its medieval cathedral is a major tourist attraction an hour's drive from Rome. Thus Orvieto targeted a certain number of cities approximately its own size with a cathedral or similar geology or some other feature in common with itself—including, of course, a good mobility track record.

Orvieto was twinned with, among other cities, Bethlehem, whose mayor, Mr Hanna Jamil Nasser, had visited Orvieto and expressed serious interest in Orvieto's experience in innovative mobility.

Thus EMERET's efforts to form a network began with two cities in place, Orvieto in Europe and Bethlehem, under the Palestinian Authority, representing the third countries. Only three or four more were needed.

Unfortunately adding three cities seemed a good deal easier than it was.

The sources. While the office of the mayor of Orvieto pursued its contacts in France, Israel, Jordan, Malta, Morocco, and Spain, the project team at ITr began with the published list of EC contact points and the CORDIS project database (EC projects). We also did general research in reference books and on the Internet to identify cities with the physical characteristics and populations we sought. DITS provided University contacts in a number of countries.

Each source provided a little help, but very little. Of the EC contact points only Malta and the Palestinian Authority even replied. These led, respectively, to the addition of Valletta and to a contact with the Applied Research Institute of Jerusalem, since Bethlehem was already enlisted. The university contacts led to the addition of one city (Jerash) and to correspondence with researchers in Lebanon and Egypt. Our own EC (INCO-Med) contacts (other than the contact points) produced additional contacts with researchers. We had great difficulty finding our way into mayors' offices and city transport departments without, as it were, an introduction. Such an introduction might have been provided by embassies (we also contacted embassies to Italy) or EC contact points, but they were not.

Évora was, in many respects, the ideal case: we had identified it from our own knowledge as possessing the desired characteristics, and it had participated in at least one EC transport project. The contact person for that project, a young engineer in the city administration, was eager to help with EMERET.

The cities of the network. The final EMERET network comprises two European cities and three Mediterranean partner country cities:



Bethlehem, Palestinian Authority (25,000)

Évora, Portugal (48,000)

Jerash, Jordan (45,000)

Orvieto, Italy (20,700)

Valletta, Malta (7,600)

We chose European cities that could provide best practice examples with regard to transport measures and methodologies tried in past national and European projects, such as CAPTURE for Orvieto and SITE for Évora (for further information see Annex F).

The main goal of the EC-funded project CAPTURE (CARs to Public Transport in the URban Environment) was to evaluate the use of physical transport measures to encourage people to use public transport, walking and cycling rather than cars.

SITE (Integrated System of public Transport and car parking of Évora) is a project funded by a local company with private and public stakeholders. The objectives of the project were the reduction of the number of cars in the historical city centre, new car-parking, the reduction of the levels of pollution, creation of pedestrian zones, improvement and extension of the public bus services.

The Mediterranean-country cities should have provided a picture of typical problems of those areas. These Mediterranean cities are potential sites for further pilot projects.

Although Valletta's population is well under our preferred minimum, it is Malta's most populous city (and is the capital). Furthermore, Malta has very peculiar geographical features that affect its city transport system structure. In spite of these peculiarities, the implementation of some measures is possible.

### **Identification of the indicators**

The next step in the benchmarking was the identification of indicators that provide a concise but significant description of the transport system features. This step was critical because the indicators set the limits to the level of in-depth analysis that can be made. For each indicator; qualitative or quantitative information was collected by means of a series of questions on transport infrastructures and services available.

We did not start from scratch but based our selection of indicators on three EC-funded transport projects (DG VII, the present DG TREN–Energy and Transport):

1. the Citizens' Network Benchmarking Initiative pilot project (1999);
2. the Citizens' Network Benchmarking Initiative full project (2001–02);
3. MAESTRO (1998–99).

In the first two projects ITr participated as project manager for the city of Terni; DITS participated extensively in the third.

The Citizens' Network Benchmarking Initiative pilot and full projects were intended to enable European cities and regions:

- to share knowledge in the field of local and regional passenger transport;
- to learn from each other through the comparison of the performance of their transport systems across all modes of transport.

The pilot project involved 15 cities and regions and developed 38 indicators, while the full project involved 40 cities and regions and developed 39 indicators (most of which remained unchanged).

MAESTRO (Monitoring, Assessment and Evaluation Scheme for Transport Policy Option in Europe) provides guidelines to aid decision-making for the selection, design and evaluation of pilot and demonstration projects for transport in Europe. It also provides a series of transport indicators, to which we referred.

Our first task was to develop a questionnaire (Annex B) to be used to gather information for a detailed description of the transport systems. It contained 37 indicators grouped in five sections:

1. general information;
2. how people travel;
3. transport modes;
4. environmental and social impacts;
5. how the situation is perceived.

This questionnaire proved too ambitious. The cities that had already agreed to participate found it too difficult and expensive to collect all the data requested, and some data were not available at all. The second and final version of the questionnaire eliminated many indicators (e.g. modal split, number of trips, investment in infrastructure) and simplified the remainder (e.g. questions about accidents for each mode of transport were gathered under one question for all transport modes).

The reduced version consists of 15 indicators and 35 questions (Annex C); Table 3-1 lists the topics and the indicators.

Table 3-1 Topics and indicators of the questionnaire

<i>Topic</i>	<i>Indicators</i>
General information	Population Tourism Information service
Transport modes	Vehicle ownership Road traffic management technologies PT network Number private and public transport operators The public transport fleet Taxis Pedestrianised area Bicycle paths
Social impacts	Safety Fines
How the situation is perceived	Perception of transport externalities Perception of air pollution sources

The “general information” category provided something of the social, cultural and economic contexts of the cities whose transport systems we wanted to compare. The “transport mode” section covers information about transport supply and infrastructures. The “social impact” section gives an idea of the behaviour of transport users and how strictly they are controlled.

The section title “How the situation is perceived” was intended to answer two main questions:

- what is the perception of such problems as air pollution, noise, road accidents, congestion, visual intrusion, and consumption of fuel and energy?
- to what extent are cars, trucks, buses, coaches, and mopeds and motorcycles viewed as making local air pollution worse?

At the end of the questionnaire we added an “additional information” section, in which we invited the cities to highlight the problems in their transport systems or note any features not covered elsewhere in the questionnaire.

### **Data collection and analysis**

Data collection was long and difficult. By offering an honorarium, we were able to establish contact with local experts in the municipalities willing to take responsibility for completing our questionnaire and providing other requested information. Research about the cities in publications and on the Internet yielded little more than information on tourist attractions and, occasionally, how to reach them. Data received from the local contacts had to be

evaluated for reliability and consistency. Sometimes questions relative to indicators were misinterpreted and required clarification by e-mail and telephone. This was the case in particular with Bethlehem and Jerash.

Site visits to Bethlehem, Jerash, and Orvieto, to gather additional information about local transport systems, allowed us:

- to have a first-hand look at the transport systems, its infrastructures and services;
- to collect, if possible, further data (in Jerash we assembled a panel to answer the questions of the section “How the situation is perceived”);

to check the correctness and reliability of data provided in the questionnaire.

### **Data comparison and identification of differences and gaps**

**Availability.** Thanks to the large amount of resources dedicated to the data collection activities, nearly all of the information requested through the questionnaires was made available. Only in a very few cases were any data missing, either because the information did not exist at all or because it is collected in different ways from city to city. These differences did not, however, affect the quality of the results.

**Reliability.** In the section “How the situation is perceived”, we asked the cities to answer using one of the following sources:

- data acquired in advance from surveys and interviews;
- a panel assembled ad hoc;
- personal observations from the point of view of the citizen.

Bethlehem, Évora, and Orvieto answered the questions as “personal observations from the point of view of the citizen”. Valletta answered some question on the basis of data acquired in advance from surveys and interviews. For Jerash, we assembled a panel *ad hoc* during the site visit.

With regard to the other sections all data sources were local competent authorities or offices, except for a very small amount of data that Bethlehem, Évora, and Orvieto provided as personal estimations or observations. Jerash had only regional data for the number of accidents, injured people and fatalities, and the police department officer estimate that 70% concerned.

**Comparability.** The way of collecting, aggregating, recording and managing transport system information is different from city to city (e.g. for Valletta only the number of taxis with an entry permit in Valletta is available). This means that often the comparison of data concerning the same indicator is very difficult, because the cities define it in a different way (e.g. Jerash provided the number of cars registered in the cities, and not the number of cars owned by residents). The figures for some indicators have been divided by the number of residents to make them comparable.

We chose population as standardisation factor for data on the basis of the experience of previous projects. In fact, when asked to provide the municipality surface area, some cities

referred to the built-up area and some others to the municipality boundaries. Both data were rarely available.

Afterwards data has been processed in order to identify possible differences and gaps. The small number of cities does not allow a statistical analysis, but rather a qualitative one with quantitative data.

### **3.2.3 The final conference**

The preparation of the final conference involved a number of activities. The conference was held on 29 March 2002 at the Faculty of Engineering of the University of Rome “La Sapienza” and was open to all people interested in the issues addressed by the project. Invitations were sent by e-mail and by fax not only to all the actors involved in the project, but also to administrators and representatives of research bodies of other Mediterranean cities and to the Rome embassies of relevant countries. A sum of up to 1,000 euro for travel and lodgings expenses was made available to a selected few invitees. People from Algeria, Egypt, Jordan, Libya, and the Palestinian Authority attended the conference; some were already in Rome, while others made a special trip.



Figure 3-1 The final conference

The final conference programme is available for download from the Web site. During the conference were presented the results of the benchmarking exercise, the description of the three pilot project to be implemented in the city of Bethlehem and the problems encountered in the course of the project. In Prof. Francesco Filippi's presentation on transport and tourism in historic cities, he outlined the mobility problems of historic cities and discussed policies and measures from the EU transport research programme. The conference closed with a roundtable on the transferability of the European research to the Mediterranean countries. The materials distributed at the Conference, including the presentation slides, are attached unbound.

### **3.3 Results achieved**

#### **3.3.1 *The Pilot projects in the city of Bethlehem***

In this section we describe the three pilot projects defined for the city of Bethlehem.

##### **Pilot project 1: the pedestrianisation of Star Street**

The streets of the old city are narrow, steep and tortuous; some have heavy pedestrian traffic during the day, some do not. In both cases there are problems of compatibility with cars. In the first case car traffic, illegal parking and tolerant police mean difficult circulation for pedestrians. In the second case, car traffic, often too fast for these streets without pavements, means safety problem and a feeling of danger for the few pedestrians.

Two important pedestrianisation measures were recently taken:

- car traffic through Manger Street was limited;
- Paul VI Street, between the intersections with Fawagreh and Star streets, was made a pedestrian-only road.

To develop pedestrian streets in the historic centre, the study examined the possible candidates and compared the pros and cons of each with these main objectives:

- improving walking conditions and safety;
- encouraging tourists to discover the town's heritage on foot.

The area, where the first pedestrian streets will be chosen as a pilot project, is delimited by part of Paul VI Street from Madbasseh Square, Salesian Street and Star Street.

The possible candidates for pilot project 1 are:

1. part of Paul VI Street and the beginning of Salesian Street;
2. the second part of Salesian Street to the intersection with Star Street;
3. part of Star Street from the above intersection and the last part of Paul VI Street to Manger Square.

Each alternative can be implemented independently. Table 3-2 lists the pros and cons of each alternative.

The result of the comparison is in favour of Star Street as the first pilot project site. But to be effective it needs to define different kinds of measures:

- the measures it needs to work as a pedestrian street;
- measures to improve its accessibility to pedestrians from outside;

- measures to increase the number and importance of tourist destinations in Bethlehem.

Table 3-2 Pros and cons of the three possible sites for pilot project 1

<i>Alternative</i>	<i>Pros</i>	<i>Cons</i>
1. Paul VI	<ul style="list-style-type: none"> <li>• would improve the quality in a street crowded with pedestrians.</li> </ul>	<ul style="list-style-type: none"> <li>• would increase car traffic and parking in Najajereh Street;</li> <li>• is isolated in the heart of the old city with no pedestrian continuity between the main, tourist attractions.</li> </ul>
2. Salesian	<ul style="list-style-type: none"> <li>• would reduce car traffic in Paul VI Street.</li> </ul>	<ul style="list-style-type: none"> <li>• would increase car traffic in Najajereh Street;</li> <li>• would necessitate changing the direction of Tabash Street;</li> <li>• is too small and isolated to be effective for pedestrians.</li> </ul>
3. Star	<ul style="list-style-type: none"> <li>• near the bus station, the new commercial centres and parking;</li> <li>• pedestrian network with Paul VI pedestrian street and Manger Square linking important tourist sites;</li> <li>• there are no building activities;</li> <li>• would eliminate the traffic link between north and south crossing the old city;</li> <li>• presence of artisans and commercial activities that need to be revitalised;</li> <li>• would eliminate fast traffic in narrow streets.</li> </ul>	<ul style="list-style-type: none"> <li>• has very few pedestrians;</li> <li>• would increase the trip distance between North and South;</li> <li>• needs a strong effort to increase substantially the attractiveness of the street.</li> </ul>

We focussed our attention on the first two alternatives, giving only some suggestions for the third.

The measures on Star Street are:

- the physical barrier to close the street;
- the choice of the closing period;

- the authorizations during the closing period for emergencies, for people with reduced mobility or for special situations (loading and unloading for construction);
- the reduction of the speed during the opening hours;
- the improvement of accessibility from outside.

During the closing period cars would be forbidden to enter and cars parked on the street would be removed. The closing period should be from 09:00 to 13:00 and from 15:00 to 19:00. This allows loading and unloading in the early morning and afternoon, and allows residents to take their children to school and to return home for lunch and rest.

Unlimited authorisation for the entrance with vehicles in Star Street is granted to police, municipality, energy, road and sewer maintenance, fire brigade, and ambulance.

Special permission may be granted to vehicles of construction companies working with a license in Star Street and invalid or handicapped persons

The largest section of Star Street is in front of the Salesian Stairs.

The measures to improve the accessibility from outside are: the pedestrian path to Star Street; provision of sufficient parking places for the cars of the visitors and the residents; information on strategically located signs along the most frequented routes.

Pedestrian accessibility is through different routes:

- the street from the entrance to Star Street to the roundabout;
- Tarajmeh Street, which must have a parking permits only for the residents;
- the several stairs from Manger Street, suitable for use downstairs if properly renovated;
- Manger Square.

The routes crossing on Manger Street must have protected pedestrian sidewalk. To reduce car speed and increase the number of parking places Manger Street has a parking lane of 2.00 m along the street in both directions and only one traffic lane, of approximately 4.00 m, for each direction.

The test will collect “before and after” information on vehicle and pedestrian traffic in the pedestrian Streets during the closing and not closing period.

### **Pilot project 2: the pay parking on Paul VI Street**

The car parking capacities in the centre of Bethlehem are adequate with the existing private parking lots, including the one that is nearly ready at the end of Manger Street close to Manger Square.

The main problem is that parking rules are not enforced. Cars are parked on the sidewalk even in street with off street parking permission.



This second pilot project is aimed at testing on-street parking with fee. The chosen site is part of the crowded and chaotic Paul VI Street. It is worth pointing out that at the same time the near parking area and the side streets are quite empty

The measures to be implemented are:

- bollards to delimit the slots and prevent illegal parking on the pavement and double parking;
- a fee (suggested \$1.00 per hour) for short-term parking with some slots always available, leaving long-term parking to the parking area and side streets;
- a fee collected manually by a couple of people in the morning and another couple in the afternoon;
- fee period only during the crowded hours from 08:00 to 13:00 and from 15:00 to 19:00

The test will collect “before and after” information on the cars parking legally and illegally, on the parking time and on the parking length period, and on the revenue.

### **Pilot project 3: the enhancement of the new station**

The new bus station is centrally located, near the old centre, the commercial area and the tourist attractions. The station provides parking for 20 buses or 60 taxis on the ground floor, for 17 buses on the first floor, for 30 buses on the second and third floors. The tourist buses have three reserved slots on the second floor.

The aim of pilot project 3 is to test the effect of a preliminary integration of different public transport services in the new station. Short-distance public transport, park-and-ride passengers and passenger accompanied by driver (“kiss and ride”) can easily connect with long-distance public transport.

The measures to be implemented in third pilot project are, in order of priority:

- moving to the new bus station a first selected group of short- and long-distance public transport, both buses, minibuses and taxis;
- timetable coordination between short- and long-distance public transport;
- fare integration with the creation of a zone-based fare system.

The first measure should improve accessibility to the different transport means, reducing the distances to be walked. The second will reduce the waiting time, and the third will simplify the payment for passengers. All measures should enhance the attractiveness of the public transport network.

The measures to be implemented need a period in which passengers, public transport operators and new station managers participate in focus groups. The measures have to be implemented gradually and must be submitted to the approval of the Palestinian Ministry of Transport.

The test will collect “before and after” information with surveys of passengers, transport operators and the new station managers about the effect of the integration step by step. The questions are about distances, waiting time and costs.

The final goal is the realisation of an integrated public transport system with the new station acting as a transit centre.

### **3.3.2 The benchmarking**

The benchmarking carried out during the EMERET project has led to several results.

Important findings also concern the difficulties met in creating the network of cities and in collecting and comparing data.

The basis for the creation of a database on the transport systems of European member and Mediterranean partner countries has been laid down. The future development of this database, with the addition of more indicators, and its extension to other cities, will constitute a useful tool for the assessment of city transport systems through comparison of their performance.

A network of Mediterranean partner and European member country cities has been created and local contact persons identified. The members of this network can now exchange information and good practices on transport system issues. The cities involved in this benchmarking exercise should constitute the nucleus of a lasting consortium of European and Mediterranean cities and research centres to be involved in future EC actions aimed at encouraging sustainable development around the Mediterranean basin in a spirit of collaboration.

Through this benchmarking exercise a comparison has been made between two typical European cities (Orvieto and Évora), two typical Middle East cities (Bethlehem and Jerash), and one city (Valletta) with a peculiar geographical location (Malta was a Mediterranean partner country when the project began, but has now become a pre-accession country).

The comparison between the five transport systems permitted identification of some differences between European members and Mediterranean partner country cities:

- the number of vehicles per head is much higher in the EU cities;
- motorcycles and mopeds are practically absent in the MED cities;
- in the MED cities the number of taxis per 1,000 residents is higher than in the EU cities; shared taxis are widely used;
- the length of the PT route per resident in the MED cities is much shorter than in the EU cities;
- the two Middle East cities cannot provide local transport information on the Web, although in Bethlehem transport information is available in many languages;
- both MED and EU cities perceive air pollution and congestion as a serious problem, noise and visual intrusion are perceived as serious problems in the MED cities;

- in the MED cities trucks and vans are viewed as contributing significantly more to the local air pollution than in the EU cities;

and finally, a very important result:

- more accidents per 1,000 residents occur in the MED cities, with a much higher rate of injuries and deaths than in the EU cities.

### 3.4 Problems encountered

In the end, we succeeded in forming a network of cities with the desired characteristics and geographical distribution. Most important, we have laid a secure basis for future expansion of the network and additional research on the problems of urban transport in Mediterranean cities.

The difficulties encountered along the way were both internal and external to the project. In the latter category can be placed *force majeure* and, to a heartbreaking extent, acts of God.

**Internal issues.** EMERET was launched as a six-month single-partner accompanying measure, not a full-blown project, and its resources were commensurate with its limited duration and size. Yet even a small, brief, low-budget project that waves the banner of the European Union is more likely to be perceived in poor countries as a source of revenue for infrastructure than as a group of researchers in honest need of colleagues and information. Thus we tended to encounter a tacit credibility gap when we failed to offer the incentive of participation in a full-blown European project. On the positive side, at such time as we can offer that, we will know where to start.

Another inherent difficulty was that, as a European project, we were exploring new terrain. There is not a large store of experience and contacts on which to draw.

**External issues.** At the risk of seeming to offer a litany of complaints and excuses, given the limited time and resources at our disposal, researching city characteristics was frustrating and time-consuming.

Information available on the Internet tends to be detailed for countries but not for cities, and even up-to-date population figures for the third countries were difficult to find, even from embassies. Finding contacts in transport departments where employees are not (in part for the reasons just outlined) disposed to volunteer their services was even harder.

Communications were a problem. E-mails and faxes (in the absence of e-mail—another problem) to professors, technical experts and bureaucrats went unanswered—and that was when we were able to find and address or number.

The project began with the assurance that Orvieto and Bethlehem would be our gateways to other cities in Europe and the Near East. Orvieto's contacts failed to materialize for a variety of reasons. But the tragic reasons why Bethlehem was unable to fulfil its potential in the project are all too well known.

The present situation of violent conflict in the area has impeded the development of the planned pilot project activities. Because nobody knows when this conflict will come to an end, the future of the three pilot projects is a matter of conjecture.

### **3.5 Technology implementation plan**

The three pilot projects in Bethlehem have been defined. The next step will be the implementation of the measures. At the beginning of the project, the Bethlehem city administration was eager to realise the interventions immediately. We thus had every reason to expect that the first results of the pilot projects would be available before the conclusion of the EMERET project. Unfortunately the uncertain situation in the area, for the reasons we all know, prevents us from knowing if and when the implementation will be made and from outlining a timetable.

The EMERET project created a network of Mediterranean Partner and European Member Countries. The information provided by the cities of our network can be considered the nucleus of a Mediterranean and European city database on transport systems. This network of cities and contacts, which we hope will be extended to other cities, can provide its members the chance to exchange information about transport systems and best practices. The involvement of other research centres will make it possible to conduct in-depth analyses about the possibility of transferring the results of European research to the Mediterranean countries. ITr intends to present other proposals in the framework of FP6 to extend the network of cities and research centres. ITr has already taken part in two consortia for proposals in the strategic area “Socio-economic modernisation” within INCO MED A3.

### **3.6 Conclusion**

The improvement of the performance and sustainability of the transport systems of developing countries will provide an important stimulus to economic development and social modernisation of the same areas.

In particular, the rationalisation of the public and private transport system and the increase in safety obtained through physical traffic-reduction and pedestrianisation measures will contribute to increasing the tourism attraction of the cities involved. This will favour both the economic development of the areas and cultural interchange among the local inhabitants and the citizens of the European Union.

The differences and gaps that emerged through the benchmarking exercise highlighted possible fields of interventions to improve efficiency and effectiveness of transport systems in the Mediterranean cities. The five cities involved can constitute the nucleus of a network of European and Mediterranean cities, oriented to the exchange of information on transport systems and best practices

The three pilot projects provided information useful to the creation of a traffic policy in Bethlehem that could be both effective and acceptable to the public. Unfortunately, because of the conflict in Palestine, it was not possible to implement and test the measures defined and already tried in the European cities, and to evaluate their efficacy in a completely different socio-economic, cultural and religious context.

We conclude with some recommendations.

It would be only practical to start the next project with the network, or a core network, already in place. To that end it will be useful to continue developing the contacts acquired so far, in both cities and research institutes. It will be necessary, to put in bluntly, to spend more money—to hire research assistance, to organise working meetings, to compensate technical experts in the network cities. And finally, it would be helpful to offer the most attractive incentive of all, participation in a full-blown European project.

## 4 Management report

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Because EMERET was a single-partner project, the management and co-ordination of the work was easier than in larger projects.

Meetings were held to check the progress of the activities planned. The many problems encountered in setting up the network of cities and research centres and in collecting information about transport systems compelled us to postpone the other activities and twice request a three-month extension of the project.

The kick-off meeting was held on 2 April 2001. The co-ordinator reviewed all the tasks and activities of the project, focusing on those to be carried out in the first part of the project, assigning resources to each task.

A meeting to check progress was held on 7 May 2001.

The two meetings, on 11 June and 27 July 2001, focused on the problems encountered in setting up the network of cities and research centres and the need to simplify the questionnaire. It was decided to request an extension of three months.

During the meetings held on 31 August and 25 September 2001, the first information sent by the cities that had joined the network was analysed. Once again attention focused on the problem of involving other cities.

Meetings on 26 October and 29 November 2001 addressed the problems encountered in collecting information (above all in the Middle East cities) and the need for a further three-month extension of the project length.

30 January 2002, a meeting was held to plan the final conference and to prepare for analysing the results of the benchmarking.

The last meeting was held on 12 March 2002. The last arrangements and orders for the final conference were decided, and the presentations were reviewed.

Besides the co-ordinator, Luca Persia (ITr), Francesco Filippi (DITS), Maureen Fant (ITr) and Marco Valerio Salucci (ITr) attended all the meetings. Stefano Mocio, the deputy Mayor of Orvieto, attended some of the meetings.

## **5 Completed catalogue page**

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### **5.1 Summary**

The EMERET project aims to contribute to the improvement, through greater sustainability and interoperability, of the regional and local transport systems of the Mediterranean countries, with particular attention to the areas of greatest interest for tourism.

The inadequacy of some parts of the transport system is a stumbling block to economic development in countries of the Mediterranean area (North Africa and the Near East) endowed with an extraordinary historic, cultural and natural heritage that is potentially a major attraction for tourism.

The project's specific objectives are:

1. to verify the transferability of innovative measures and methodologies tried in European cities to the very different cities of the third countries of the Mediterranean;
2. to define a pilot project in the city of Bethlehem, on the basis of both such experiences and a detailed analysis of the specific local problems;
3. to form a small network of tourist-destination cities in Europe cities and the third countries of the Mediterranean;
4. to organise a final seminar for presentation of the project results.

The project activities can be divided into three groups:

1. analysis of the problems of the Bethlehem transport system, definition of pilot projects and analysis of the application of prime measures;
2. creation of a network of cities and research centres for research on the transport of the Mediterranean countries;
3. preparation of the final seminar.

The principal activity of the network is the exchange of information. Each city received a questionnaire specifically designed for the evaluation of the features of the transport system and the methodologies of planning and evaluation of the results currently in use.

In the final seminar the problems of the Mediterranean cities that emerge in the course of the project were compared with the more advanced experiences of the European cities. The first results of the pilot project of the city of Bethlehem were presented.

### **5.2 Results achieved**

The EMERET project laid down the basis for the creation of a network of Mediterranean partner and European member countries. The orientation of the network is towards the exchange of information and the sharing of best practices and knowledge on transport systems.

The benchmarking exercise highlighted possible fields of interventions for improving the efficiency and efficacy of transport in the Mediterranean cities.

In the city of Bethlehem three pilot projects have been defined, but they could not be implemented owing to the outbreak of hostilities.

A final conference was held, where the problems of the Mediterranean cities transport systems were discussed and analysed.