TRANSPORT AND ACCESSIBILITY IN A VISITOR MANAGEMENT STUDY: AN APPLICATION IN ITALY

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ABSTRACT

The paper reports about the method employed for an accessibility study carried out as part of a wider visitor (*i.e.* tourist) management study. The overall visitor management study included analyses and proposals about Hospitality, Information, Accessibility, and cross-cutting issues, and focussed on the area of the Lake Orta in Piedmont, Italy.
The methodology employed in the study on accessibility and transport services aimed at collecting relevant data for the area, highlighting the current state of transport services and facilities, and at extracting information to help steer possible tourism related policies. The study used disaggregate measures of accessibility and transport provision which could relate intuitively to daily experiences of tourists as well as of decision makers and stakeholders involved in consultations. Disaggregate measures have been chosen so as to favour communication, keep details, and avoid introducing combination coefficients which might not be transferable in time or space (e.g. for monitoring).
Assessments and proposals in the study refer to two elements of accessibility: external accessibility and internal accessibility. The external accessibility assessment depicts or measures the ease of reaching the area from elsewhere by airplane, train, car, bus. The internal accessibility is related to the state of connections by train, bus, boat, or their combination, and the provision of facilities to travel by car, bike and on foot within the area on which the study focussed.

Keywords: tourism, accessibility, visitor management

INTRODUCTION AND MOTIVATION

The visitor management framework (see e.g. World Tourism Organisation, 2004, and Shackley, 1998) entails studies and actions on three main aspects of tourism within a subject area or a place: hospitality, information, and accessibility. Then, cross-cutting issues should be added, as there are several easily spotted in the course of a piece of work and also since they are an important source of suggestions for action.

The Region Piemonte, in the North-West of Italy, following the approval of a Regional Strategic Plan for Tourism, set out to test the visitor management methodology as a means to improve tourists' reception. Three tourist areas in Piedmont, differing by general and geographical characteristics as well as types of tourism, have been chosen for pilot studies of such a visitor management methodology:

1. the Lake Orta area, set around the lake, object of the work discussed here and briefly described below;

2. the Venaria Reale palace and surroundings, strongly characterised by the presence of the palace and its park, and located very near the city of Turin;

3. the Susa Valley, not limited to the area well known for its skiing resorts that hosted the 2006 winter Olympics' Games but including the lower part of the valley rich with tourist attractions not related to winter sports.

The expected results of the pilot studies are a work methodology robust and flexible enough to be used on other areas as well as technical inputs to the discussions with the Region and the local stakeholders towards a set of guidelines for action for each of the areas investigated.

All three pilot studies have been carried out by the same team of researchers, including – for the part on accessibility - the authors of this paper, and have reached or are nearing completion.

This paper focuses on the Lake Orta study and on the accessibility analyses and proposals elaborated in 2008 and presented in SiTI and DICAS (2008). Work on others areas have been or are being described in specific papers (see *e.g.* Levi Sacerdotti *et al.*, 2009, Gasca, 2009, Mauro, 2009, Pollichino and Stupino, 2009). A book, expected by the end of 2010, should collect a discussion on the methodology employed for the whole study and for specific topics as well as detail how such methodology has been further developed through the period of work and adapted to the different applications.

THE AREA AND THE AIM OF THE STUDY

The area

The Lake Orta is located in the North-West of Italy and the area centred on it and included in the investigations has about 52,000 residents and extends for about 305 Km^2 (see Figure 1). The area offers 4,661 beds, of which 1,545 in hotels and 3,116 in others kinds of accommodation (2007 data) while the number of nights spent in tourist accommodation in the area were 201,350 in 2006, though it should be noted that such data on availability of beds and number of stays do not capture the information about holiday homes.

The area is not homogeneous: there is a touristic tradition along part of the shores, while South-West of the lake is located a renowned industrial district specialised in taps and fittings and at the North-East end of the lake there are industries specialised in quality kitchenware.

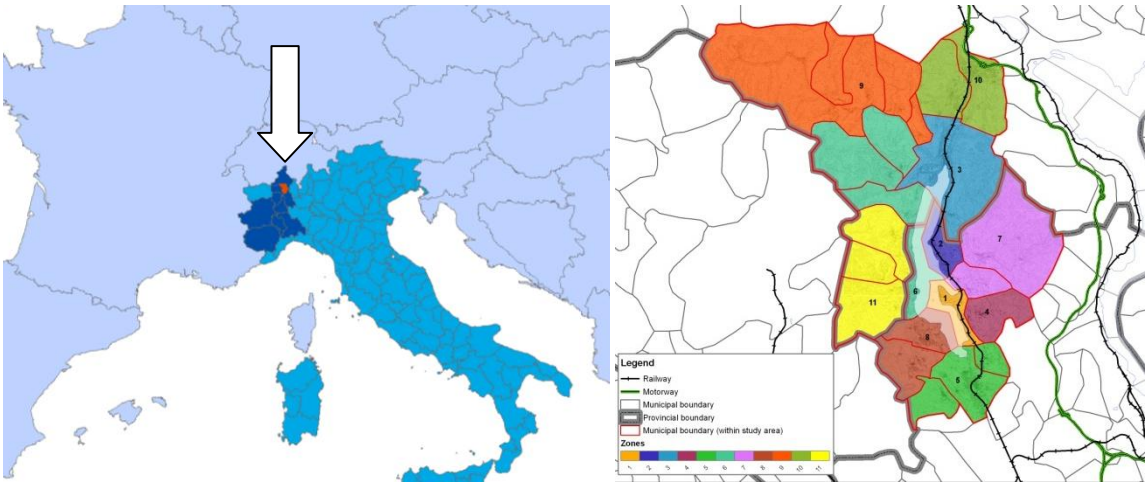

Figure 1 – the Lake Orta area location in Italy (on the left) and extension around the Lake (on the right). The latter is represented by the white-ish shape at the centre of the picture

The general aim of the study

The general aim of this set of pilot studies was to provide a methodology to support the elaboration of guidelines for action on tourism. In the Lake Orta case, ideas and opportunities for redistributing tourists in time and space were sought. At present the tourist season is concentrated on the spring/summer months and most tourists spend their holidays immediately around the lake while there are several attractions, of different appeal depending on the profile of the tourists, that could enjoy more visits.

The transport section of the study was aimed at understanding the accessibility, as would be experienced by tourists, due the transport systems taking to and from the study area and due to the transport systems within it. This would be extremely wide a scope and, due to the nature of the study, it has been chosen from the outset to focus it on the supply of transport infrastructure and services. Some aspects of the current interaction between supply and demand for transport have however been captured during surveys and interviews and in

other parts of the study as, for instance, during focus groups with stakeholders carried out following the Project Cycle Management methodology.

ASSESSING AND REPRESENTING ACCESSIBILITY: A METHODOLOGY

A scarce body of relevant literature

Looking for an established methodology for the task outlined above we found a very scarce body of literature, noting also that most of it focuses on long distance travel by tourists to reach their destinations. A number of studies (*e.g.* Gismondi, 2006) use aggregate measures of accessibility, suitable for modelling exercises or for macro-comparisons among different areas, but unsuitable to sustain a discussion with stakeholders on local issues, which was our final aim.
Therefore we set out to develop a methodology borrowed from more general transport engineering applications according to our own requirements, which are detailed in the next section.

Requirements for the methodology and the results

The study was aimed at understanding the suitability for tourist travel of the transport systems taking to or from the study area and the transport systems within it. Results had to depict strengths and weaknesses of the present transport systems for touristic purposes so as to be used along with results of other elements of the visitor management study (*e.g.* focus groups with stakeholders, investigations in the other strands of the study, present patterns of visits from surveys, interviews with tourists) for the generation of ideas for change, when required. It was decided to place a particular importance on using intuitive – but not simplistic- accessibility measures, that is related as directly as possible to the experience of the tourists (and of the stakeholders) so that results and suggestions for actions would also be easy to communicate and discuss with operators and decision makers, but the assessments would be robust.

The methodology employed had to be flexible enough to be applied also to other case studies (not simply those mentioned here), types of tourism, kinds of place and also later in time to monitor situations and actions' effectiveness. For this latter reason there was a focus also on future comparability of measures obtained.
Moreover, since only some objectives of the possible actions were already outlined (*e.g.* redistribute visitors among touristic attractions) the assessment methodology had to be comprehensive and flexible enough to be of help in the study and attainment of possible further objectives.
Finally, to allow testing possible policies implemented before a monitoring exercise, the methodology had to be able to capture the effects of actions carried out or changes happened.

This is a very wide set of requirements that could be translated into actual measures once a definition of accessibility had been characterised. There are several ways to define and measure accessibility in transport engineering (for a thorough review see *e.g.* Geurs and van Wee, 2004). Here accessibility has been characterised according to the definition that identifies it as the ease of going from the origin of a journey to the destination (operationalised as generalised cost), and has been calculated separately for each of a number of relevant transport modes.
One additional reason that led us to exclude aggregate measures of accessibility/generalised travel cost (for instance combining effects of time, distance and cost into a single index) is that using disaggregate measures allowed us to avoid including weights (as required in functional combinations of elements) which need calibration and could be not transferable in time -or space- hampering future comparisons.

Classical measures of accessibility used in transport studies such as distance, time, out of pocket costs have then been calculated separately and supplemented with elements still linked to the generalised cost of travel but particularly relevant to the tourist experience such as ease and comfort of the journey (assessed by looking at *e.g.* number of transfers, ticketing integration), information (determined by surveying *e.g.* stop signing, ease of getting tickets and travel information). Such elements are also relevant to the travel of residents and allow highlighting possible improvement points for them as well.

The assessment of accessibility as well as the set of analyses and proposals have been divided in two sets:

- external accessibility, related to the ease of reaching (and leaving) the touristic district with national and international transport links (by plane, train, bus or car);

- internal accessibility, related to the ease of moving within the touristic district to reach attractions and secondary products (by car, train, bus, boat, combinations thereof, by bike, on foot)

This division, which can also be found in the literature on tourism and transport (*e.g.* Quarmby, 2006), has been employed for ease of treatment and because it relates to different movements of the tourists and different set of actions.

Methods, ways of presenting results, and some suggestions from those are discussed in the next sections.

External accessibility: method to analyse and describe it

External accessibility has been defined as the ease of reaching (and leaving) the touristic district with national and international transport links by plane, train, bus, or car, and therefore depends on the long-distance transport systems and on the local transport systems taking to and from the area.

To operationalise the calculations, the external accessibility has been divided in two component parts: the accessibility of main transport nodes close to the district (airports, railway stations, motorway entry/exit points) from the external origins of visitors' travel, and then the accessibility of the study area from those main transport nodes.

The accessibility of main transport nodes from the origins of visitors' travel has been represented by the number and type of services offered except the case of motorway entry/exit points for which such elements are not applicable. In particular, for rail stations the analysis entailed inspecting number and kind of train services (international, long-distance, regional) by line, while for airports we looked at the number and kind of flights (intercontinental, international, domestic).

Main transport nodes included in the assessment have been selected on the basis of their proximity to the study area and, for the railway stations, also considering their ranking in the rail network. Altogether 10 motorway entry-exit points, 11 railway stations, and 4 airports were considered.

The evaluation of the external accessibility of the study area has then been completed by considering the journeys between each main transport node and each of a number of gateway sites - towns or villages and then locations within them- characterised for this analysis.

Knowledge of the area, of the number of tourists' stays and accommodation offered, allowed us to divide the area around the lake in 4 quadrants and choose a gateway site for each. The gateway sites are the four municipalities -out of 24 that make up the area altogether- that are deemed most representative of each quadrant. Figure 2 shows the four zones and the four municipalities taken as gateways. Actual addresses in the town centres of those municipalities have then been chosen to evaluate journeys from gateways.

The next step of the external accessibility assessment has been determining shortest paths by car (for each node and gateway), train and bus (between each rail station or airport and each gateway site) and measure the indicators chosen for each of those transport modes. For instance accessibility of the area from motorway entry-exist points has been taken as relevant for motorists only, therefore travel time (considering a fixed travel speed by category of road) and distance have been measured. For travelling from railway stations and airports both public transport and private car have been taken into account. For those nodes and car travel the indicators are again time and distance, while for public transport travel time and distance –leading to commercial speed- have been considered for each of five time bands (start of service-9.00; 9.00-13.00; 13.00-17.00; 17.00-20.00; 20.00-end of service) along with number of transfers required and modes used.

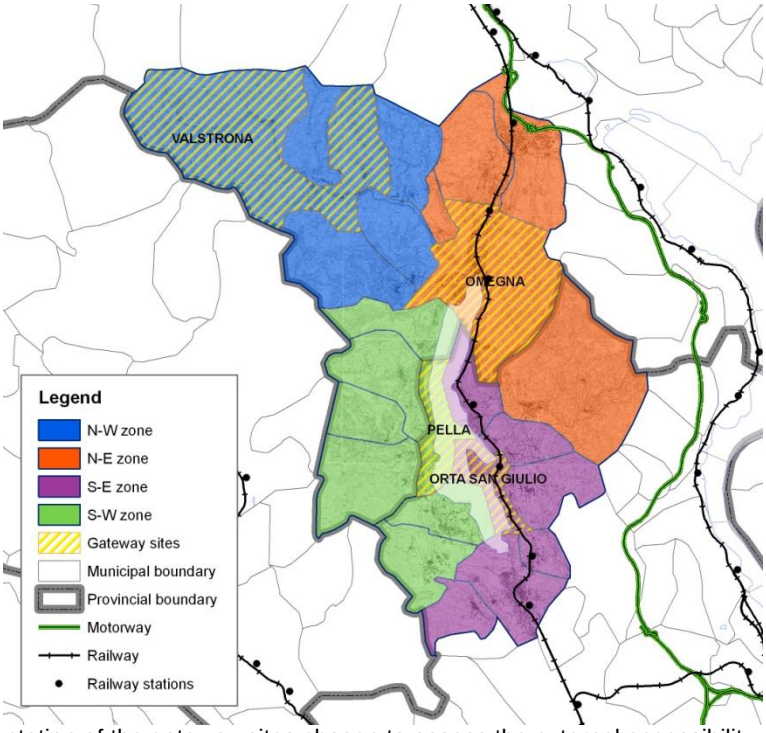

Figure 2 – Representation of the gateway sites chosen to assess the external accessibility. The white shaded shape at the centre of the picture represents the lake

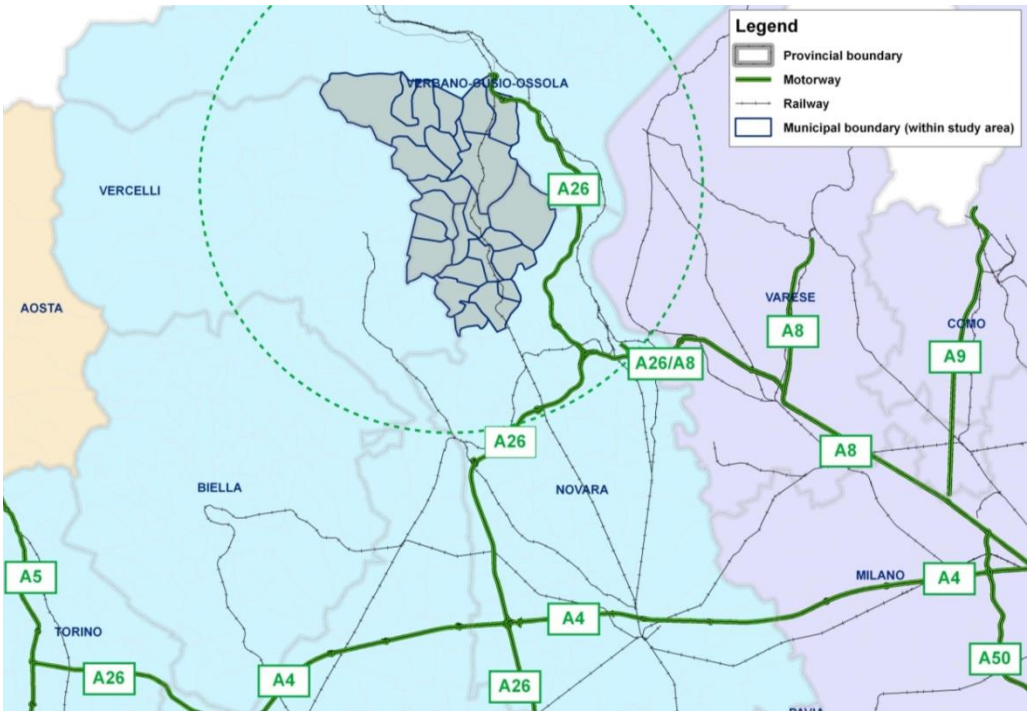

Figure 3 – The motorway network in the proximity of the study area (the latter is coloured in grey)

Original data have been collected and organised in vectors and matrices. However, to depict external accessibility both in technical analyses and with stakeholders they have been illustrated with graphs.

For instance, number and quality of services available at main transport nodes have been presented along with distances and times to reach gateway sites, as shown in the example in figure 4, providing an immediate snapshot of that component of external accessibility.

Comparing times by public transport with those by car has also helped giving a picture of their competitiveness as in figure 5, for instance.

Histograms like those in figure 6 have been used to represent how many public transport services are available in each time band (highlighting, for instance, when services are missing) and how many transfers are required to reach the destinations.

The ease or complexity of using public transport to reach the area has been depicted with block diagrams as the example in figure 7. This kind of representation underlines when there is a need for (more) direct links.

Also cumulated opportunities graphs have been used to show *e.g.* the number of long distance train services available within a given travel time threshold.

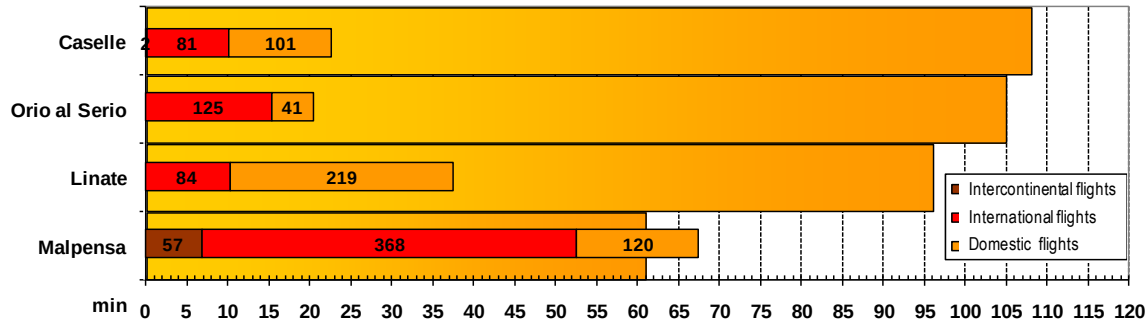

Figure 4 – Travel time on shortest paths from airports to the gateway node of Orta San Giulio together with an indicator of the level of service of the airports measured by kind and number of flights per day

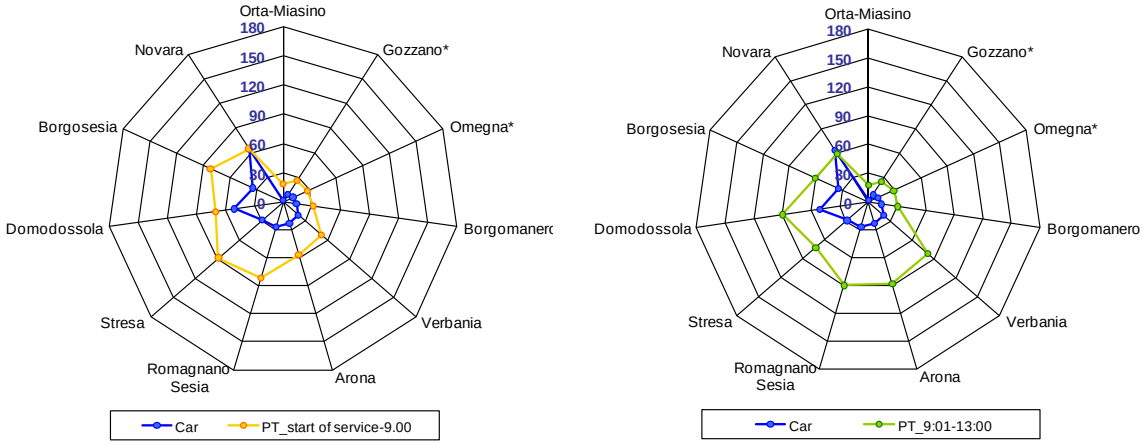

Figure 5 – Example of comparisons between times required for the journey from a railway station to a gateway site, travelling by car and by public transport

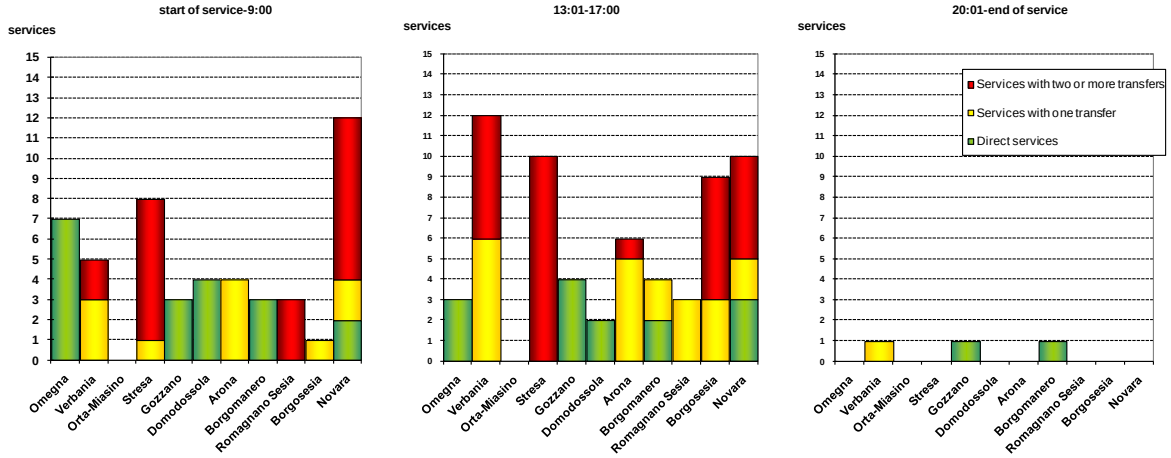

Figure 6 – Histograms depicting number of services by public transport between a main transport node and a gateway site in each of 3 time bands (out of a total of 5 that were used)

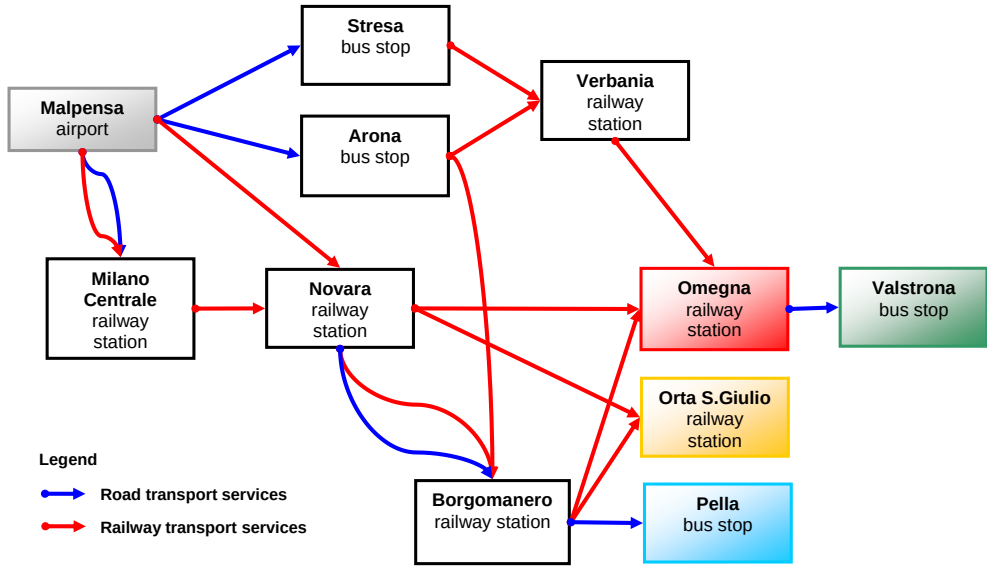

Figure 7 – Block diagrams were used to show how easy or difficult it is to get from airport to a gateway to the area by public transport. Here options and complexity of travelling from Milan Malpensa to the area are shown. The four gateway locations are represented by the coloured rectangles on the right. Since the time when this diagram was compiled the Region has introduced a new direct bus service.

Internal accessibility: method to analyse and describe it

Internal accessibility, *i.e.* the ease of moving within the touristic district to reach attractions and secondary products, may play an important role in the quality of the tourist experience. In this work internal accessibility of the study area has been assessed by dividing it in a number of zones and considering a reference site for each zone.
The work has been carried out along the following steps:

- Definition of analysis zones

- Characterisation of centroids
- Characterisation of routes between each couple of centroids (for each mode of transport considered)
- Definition and measurement/survey of relevant indicators
- Representation and analysis of relevant indicators

Zones are made up of a town or a village or a group of adjacent ones, chosen on elements such as local relevance, number of attractions (surveyed in another section of the study) and tourist attendance (according to official statistics).
In particular, municipalities with more than 10,000 tourist stays (a threshold set knowing the total number of stays in 2006, the reference year) have been considered as zones on their own. Municipalities with less than 10,000 tourist stays have been aggregated or considered on their own so as to form zones with approximately the same number of attractors. For each zone the representative municipality has been chosen as the one that had had the highest number of stays in the reference year. For municipalities with zero or unknown number of presences zones were formed by aggregating adjacent municipalities so as to form zones with a similar number of attractions; the representative municipality for the area has then been taken as the one with most attractions. Figure 8 shows the 24 municipalities included in the area of study, as grouped in 11 zones.

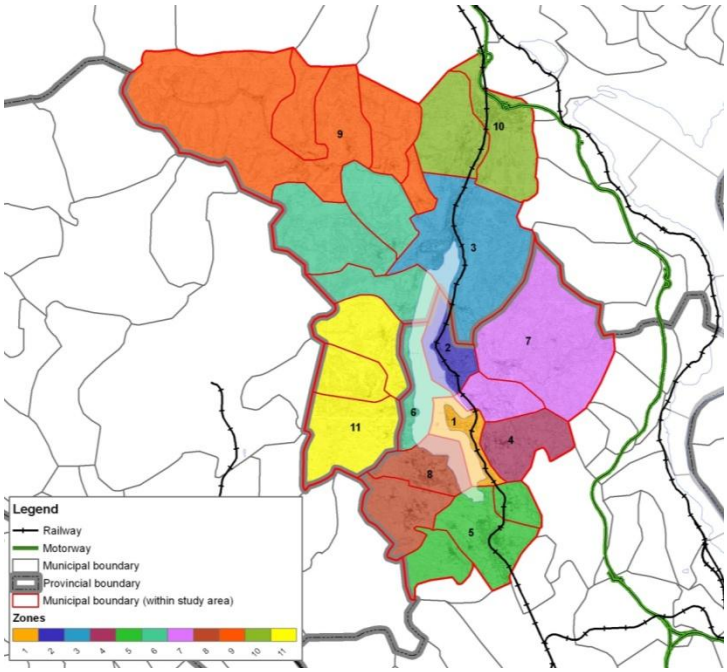

Figure 8 – The 11 analysis zones in which the area has been divided for the internal accessibility assessment

A centroid was then chosen to represent each zone. Unlike in transport modelling, here centroids are actual places –i.e. places with an address- within the municipality representative for the zone so as to allow *e.g.* calculation of distances and travel times or survey whether directions to other places are given.

Choosing zones, representative places and then centroids is, of course, an approximation and, as such, a critical step of the analyses. It is however a necessary step to make the analyses practically feasible.

The study was extended to travelling between each couple of centroids by a number of modes: car, train, bus, boat, combinations of public transport means, bike, on foot, considering the different relevant routes. The indicators were chosen also considering the answers to a survey among tourists that had asked which, if any, problems had been encountered during their journeys.

For movements within the touristic district time or distance travelled are just some of the components leading to the quality of the journey and its suitability for tourist movements. Indeed, ideally such an assessment should extend to investigate ease of movements for different tourist profiles and for the different relevant sites. Moreover sometimes a section of a journey, such as a boat trip, is a primary part of the touristic experience and what really is important could be how easy it is to reach a tier or to gather information on that boat trip and, for instance what scenery is visible during the boat trip rather than the travel time or the distance covered.
For those reasons we surveyed a large numbers of indicators between each couple of reference sites and for each transport infrastructure or service.

For instance, when considering travelling by car we included consideration of origin-destination (OD) related information such as: travel time and distance on shortest route, distance “as the crow flies” (to compare it with that on the shortest path), whether motorways are included in the shortest path and what is the cost of tolls (motorways in the area are tolled), whether the road signing is satisfactory (*i.e.* it is continuous and consistent). The latter point has been defined through surveys as described in Mauro (2009). Information was also collected on each origin or destination place such as whether there is a limited traffic area, how many parking spaces are available, how many of those are free and how many tolled and, in the latter case, how much is the average hourly cost of parking at destination. It was also surveyed whether at the origin or destination of journeys a taxi rank or service is available. Information on accidents (using official data available detailed to municipality level) and on roads used also by heavy commercial traffic (*i.e.* trucks) have also been considered.

Different indicators were surveyed for transport services. For example, for bus transport we measured elements such as: travel time, cost, distance between origin (centroid) and stop, distance between stop and destination (centroid), number of services and number of transfers required in each of five time bands (start of service-9.00; 9.00-13.00; 13.00-17.00; 17.00-20.00; 20.00-end of service), presence or absence of clock-face timetable, possibility of carrying bikes, stop furniture and availability of posted timetable, car parking spaces at stops.

To give another example, for boat transport we surveyed information such as the availability of direct public service, the availability of direct private boat service, travel time, cost, number of services and number of transfers required in each of five time bands (same as considered above and for all the analyses on public transport), presence or absence of clock-face timetable. The number of piers at origin and destination sites as well as their distance from the relevant centroid have been considered along with whether relevant piers are easily distinguished, whether there is adequate signage to find them starting from the centroids, whether parking spaces are available in their proximity.

Where relevant, data have been collected both for working days and Sundays/weekends, also underlining which services exist only during the school season or particular events (e.g. markets). For instance, the information collected showed that bus services are clearly set for residents (*e.g.* students and workers) while boat services are geared to tourists (*e.g.* they run March to October and there are more services at weekends).

Information collected from surveys and documents such as timetables has been supplemented with interviews to local police and tourist operators and with anecdotal evidence, also on cross-cutting issues.

As can be easily figured, this is a vast body of information which had a large interest for the research team but had also to be shown to stakeholders in as clear a way as possible and we found the latter an interesting challenge. While much of the data was organised and shown in matrices (most information related to OD journeys) or vectors (information about each single O or D place) in turn organised in tables, those were supplemented by graphics whenever possible. Some relevant examples of results' presentations have already been given in figure 5 and 6, in the section on external accessibility. Some more information was better presented in maps, as it the case for road lighting, bicycle paths, and footpaths (figure 9) relevant for bicycle travel and for people travelling on foot during both day and night (e.g. between hotels and village centres or transport stops). Maps have also collected information *e.g.* on grade of roads (for bicycle use) or on roads used by heavy commercial vehicles.

Photographs taken during the surveys have been useful in recalling issues also with stakeholders. Figure 10 shows the mixed use of roads along the shores and figure 11 points to the need for footpath provision along some stretches of road.

Besides pointing out characteristics of the transport systems, the analysis included an indication of whether the elements surveyed can be modified.

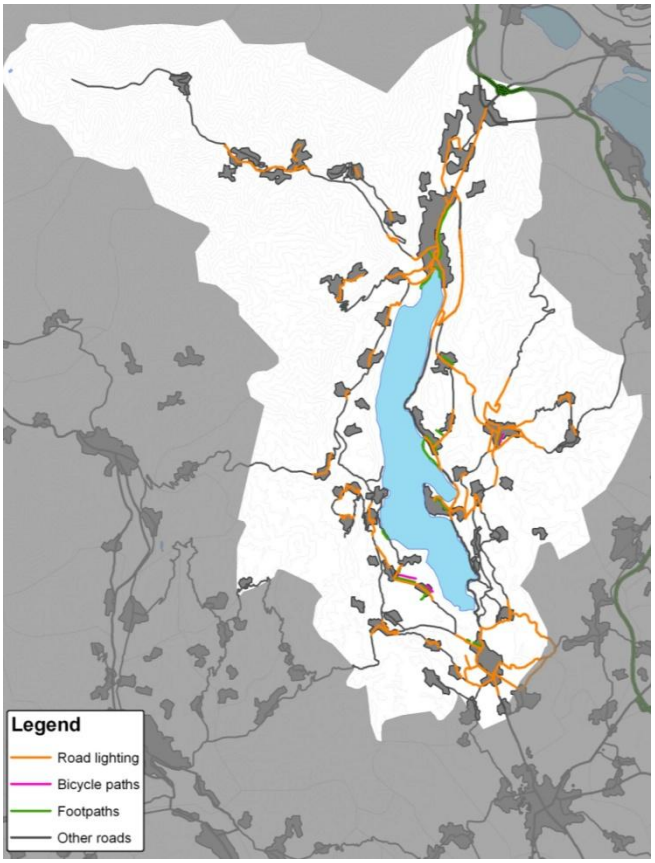

Figure 9 – Extension of road lighting, bicycle paths, and footpaths

Figure 10 – The road around the lake is used by mixed traffic.

Figure 11 – A further photograph showing the mixed use of roads: some stretches of the road around the lake do not have footpaths and are nonetheless used by pedestrians who walk at the edge of the carriageway as shown in the yellow oval.

SUMMARY

The paper has described our effort to collect and organise data to study the accessibility and the transport services around the Lake Orta, in North West Italy, as part of a visitor management study. The aim of that work was to highlight the current state of transport services and facilities, link it to the parallel strands of work on hospitality and information and on cross-cutting issues included in the same study and extract information to help steer possible tourism related policies and actions.
It was known from the outset that one of the requirements for the actions to put forward would be to redistribute tourists around the lake in space (inviting them to see less visited attractions) and in time (enticing them to visit out of the main touristic season).

The study reported was also a pilot to test a methodology that had to be applied to other kinds of touristic systems and areas.

The paper has described the methodology employed and the effort made to show data as clearly as possible to stakeholders.

Assessments and proposals in the study referred to two elements of accessibility: external accessibility and internal accessibility. The external accessibility assessment depicted or measured the ease of reaching the area from elsewhere by airplane, train, car, bus. The internal accessibility is related to the state of connections by train, bus, boat, or their combination, and the provision of facilities to travel by car, bike and on foot within the area on which the study focussed.

The study used disaggregate measures of accessibility and transport provision which could relate intuitively to daily experiences of tourists as well as of decision makers and stakeholders involved in consultations. It has been chosen to employ disaggregate measures so as to favour communication, keep details, and avoid introducing combination coefficients which might not be transferable in time or space, *e.g.* for monitoring. Indeed, it was stressed while presenting results and suggestions for action (which are out of the scope of this paper) that relevant changes should be monitored regularly. While this work was intended as a pilot study and provided a snapshot of the situation, this is useful only within a limited time span. Keeping an eye on changes and their consequences in the district is key to work towards the aims then agreed among stakeholders.

It should be remarked that, to our knowledge, while a wealth of descriptions of case studies on tourism and mobility is available, we were not able to find literature on tourism and accessibility looking at the matter in such a practical and detailed way as was required in our case.

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