Available online at www.sciencedirect.com

ScienceDirect

Transportation Research Procedia 27 (2017) 317–324

Transportation Research Procedia

www.elsevier.com/locate/procedia

20th EURO Working Group on Transportation Meeting, EWGT 2017, 4-6 September 2017, Budapest, Hungary

Policy Strategies for the Mitigation of GHG Emissions caused by the Mass-Tourism Mobility in Coastal Areas

Federico Cavallaro[a,b], Olga Irranca Galati[a], Silvio Nocera[a]*

[b]*Eurac Research, Institute for Regional Development, Viale Druso 1, I-39100, Bolzano Italy*

Abstract

Several studies on the relationship between tourism transport and CO_2 emissions have shown that the transport sector generates the largest proportion of emissions, accounting for 75% of overall emissions. These studies have also shown how the measures to reduce these emissions vary according to the different tourist destinations. Accordingly, this paper focuses on the impacts of mass-tourism mobility on the transport system of a prototypal Mediterranean coastal city. Conscious of the fact that not all Mediterranean maritime cities are the same, this work identifies the three major characteristics (urban structure, environmental fragility and cultural heritage) that influence – negatively or positively – tourism and the transport sector. The aim of this paper is to develop an original taxonomy of the best transport practices for reducing the congestion effect and GHG emissions, which is adapted to the prototypal coastal city and in line with its historical and environmental value.

Peer-review under responsibility of the scientific committee of the 20th EURO Working Group on Transportation Meeting.

Keywords: Sustainable Transport; Mass-tourism Mobility; GHG reduction strategies; Mediterranean cities; Tourism-mobility Integration

1. Introduction

Transport is responsible for about 26% of total greenhouse gas (GHG) emissions in Europe, thus making it one of the major contributors to global warming (EEA, 2016). The issues surrounding this relationship are manifold, but this article focuses on a specific seasonal problem: the impact of mass-tourism mobility in a specific type of Mediterranean coastal city. During summer, these areas face mass flows of tourists that place great pressure on the transport system and infrastructure. These sectors are often unable to absorb the increasing traffic volumes and hence contribute substantially to increasing climate change impacts. Tourism and mobility are strictly connected, since there is no tourism without a physical displacement. Two different forms of mobility can be identified (La

* Corresponding author. S. Nocera Tel.: +39 041 257 1370; fax: +39 041 257 1392. *E-mail address:* nocera@iuav.it

2352-1465
Peer-review under responsibility of the scientific committee of the 20th EURO Working Group on Transportation Meeting.
10.1016/j.trpro.2017.12.062

Rocca, 2015): the displacement generated by the need to reach the destination and the flow of tourists into the city via various means of transport to visit tourist attractions.

The UNWTO specifies that tourism is responsible for about 5% of global CO_2 emissions and the transport sector - including air, road and rail - generates the largest proportion, with 75% of overall emissions (UNWTO, et al., 2008). Other studies confirm the transport sector's principal responsibility for energy consumption in the tourist industry (Gössling, 2013; Katircioglu et al., 2014; Gössling and Peeters, 2015). The literature on the issue has already examined the dynamic relationship between tourist activities and CO_2 emissions (Gössling, 2002; Duval, 2007; Katircioglu et al., 2014; Gössling and Peeters, 2015). However, a rigorous analysis of the role of tourism transport in coastal areas in generating carbon emissions is still lacking, and as are attempts to identify the measures necessary to reduce the impact of this transport. Indeed, tourism could play a strategic role in promoting sustainable mobility within the destinations (La Rocca, 2015).

This paper draws on this innovative perspective and aims to assess the impact of different soft and hard measures that can facilitate the decongestion of tourist traffic. In doing so, the paper outlines an inventory of the best practices and the most suitable strategies implemented by EU Mediterranean countries in coastal areas in order to promote tourism as a tool for a sustainable mobility. The rest of the article is structured as follows: Section 2 explores the current relationship between tourism and energy consumption, looking at the impact of different tourist activities in tourist destinations. Section 3 introduces the peculiar relationship between tourism and mobility in the specific environment of Mediterranean coastal cities. Section 4 outlines the main transport policy strategies designed to facilitate decongestion as well as reducing air pollution in coastal areas; and Section 5 draws some conclusions.

2. Tourism, Energy Consumption and GHG emissions

Over the past six decades, tourism has continued to expand and diversify, making it one of the largest and fastest-growing economic sectors in the world. International tourist arrivals have increased from 25 million in 1950 to 674 million globally in 2000 to 1186 million in 2015 (UNWTO, 2016). In 2015, the number of international tourist arrivals increased by 4.6%, equivalent to an increase of 52 million over the previous year, and the forecasts prepared by UNTWO in January 2016 point to a continuation of growth at a rate of 3.5% to 4.5% in 2016.

The transport sector generates the largest proportion of tourism related emissions. Air transport accounts for 40%, followed by cars at 32% (UNWTO, et al., 2008). Previous studies have analyzed the main causes and effects of the tourism industry. The global environmental consequences of the tourism industry were examined and divided as to whether they were physical and psychological consequences: (i) changes in land cover and land use; (ii) energy use; (iii) biotic exchange and extinction of wild species; (iv) exchange and spread of diseases; (v) changes in perception and understanding of the environment (Gössling, 2002). To understand the main causes, the tourism industry was divided into three sections corresponding to the main energy consumers and GHG's emitter sectors: *accommodation*, *attraction* as well as *activities* and finally *transport* (Becken et al., 2003; UNWTO, et al., 2008).

The energy used for the *accommodation* sector includes all those activities and habits which typically occur in a domestic place (heating, cooking, cooling, illumination, cleaning, air conditioning, etc.), energy required to build and maintain the accommodations, energy needed to obtain all goods for tourists (television, computers, beds etc.), and the infrastructures necessary to book and organize the journey, the import of food, etc. (Gössling, 2002).

The second sector, *attraction* and *activities*, refers to the energy used by leisure activities. Tourists are usually active at their destinations, and the energy required to power all their activities has been assessed by the literature. Becken and Simmons (2002) studied the energy consumed by activities in New Zealand, such as heli-skiing, scenic flights, diving, scenic boat cruises, sailing, guided walks, etc. and calculated the energy-intensity relationship.

As stated previously, *transport* is the major GHG emitter sector. Chapman (2007) states that road transport accounts for 81% of the total energy consumption used by transport sector. In the tourism industry, the transport sector accounts for 94%, compared to 4% for accommodation and 2% for other activities (Gössling, 2002). This is a conservative estimate, as the energy used for construction and maintenance of infrastructures has not been taken into account. The largest amount of energy consumed by *transport* refers to all displacements made to reach the destination area plus movements within the city. Duval (2007) explains that tourism occurs at a variety of spatial scales, and so the transport modes will vary according to this scale. The primary transport modes, used to travel from origin to destination, refer to aircraft, cruise, car, bus/coach, rail transport, and motorcycle. The secondary ones