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# Mobile Apps for Tourists – Insignificant Fad or Effective Tool to Shape the Destination and Mode Choice Decisions?

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This work addresses the following topic(s) from the Call for Contributions:

- Placemaking to integrate urban spaces and mobility
- Promoting sustainable mobility choices in metropolitan regions
- Governing responsible mobility innovations
- Shaping the transition towards mobility justice
- System analysis, design, and evaluation
- other: \_\_\_sustainable tourist mobility\_\_\_

## Extended Abstract

### Motivation

The Internet is fundamentally changing the way people get informed and book their vacation, and how they organize transportation to and within a destination. Back in the day, travel information used to be provided in person at the travel agency or at the counter, as print products, on TV or on the radio. But today vacations can be planned and booked independently on a computer, tablet or smartphone. Mobile or web applications can provide the traveler with bespoke functionalities and display it in a compact format. Given the almost unlimited geographical and temporal connection to the Internet coupled with location-based services, apps can be useful in foreign areas, both in tourism and in mobility, for example serving as route planners (e.g., Rome2rio), often with real-time information (e.g., Google Maps, Moovit), or as digital tour guides (e.g., Outdooractive, Bahn-Zum-Berg). With online and smartphone apps greatly assisting travelers before and during travel, one might speculate that they could even influence their planning and booking behavior.

Therefore, in this study, we pose the following research question: *What influence do tourist mobility apps have on (1) the destination choice, and on transport mode choice (2) for long-distance trip to the destination, and (3) for local trips at the destination?*

### Data and methods

This was examined in Discrete Choice Experiments (DCE) with prospective visitors to Tyrol, Austria. Using convenience sampling, we asked potential domestic and foreign German-speaking visitors to Austria to participate in three DCE pertaining to (1) destination choice, (2) long-distance travel to the destination, (3) local mobility at the destination.

The survey design and data analysis were conducted in the *Lighthouse* software. We used fractional factorial design to obtain possibly robust data with minimized response burden for the participants. Each respondent was confronted with three DCE. In each case, they were presented with eight choice tasks. In each task, they were requested to choose one of four alternatives including an opt-out option (Figure 1).

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Each of the alternatives is characterized by a set of meaningful attributes selected from the literature. For destination choice, we used (1) price of accommodation, (2) opportunities for hiking, (3) opportunities for activities other than hiking, (4) shopping and nightlife opportunities, and (5) quality of public transportation. In terms of transport mode choice for a vacation trip, the respondent has three rail options to choose from, described by various attributes, or an opt-out option (meaning that they take a personal vehicle). The attributes are (1) travel time, (2) travel costs, (3) number of transfers, and (4) the means of transportation for the final stretch to the accommodation. This is similar when it comes to choosing a means of transportation for local travel within a destination. The respondent has a choice of three options for traveling by public transportation (or opt-out and go by car), described by travel time, travel costs, bus frequency, and walking time to and from the bus stop.

In each experiment, there is an additional attribute regarding the method of informing oneself and booking a stay or buying tickets. It can basically take two levels: (1) booking and information available separately on different websites and apps, or (2) booking and information integrated in one single app (under the name *TITRAG*). The participants were informed about the *TITRAG* app and its functionalities at the start of the survey (Figure 2).

Travel to the destination: which rail connection do you choose?

(1 of 8)


	Option 1	Option 2	Option 3	Option 4
Schedules and booking	TITRAG app	TITRAG app	separately	None of these options. I will go by car. 
Travel time door-to-door	9h	7h	8h	
Travel costs per person in one direction	100€	100€	200€	
Transfers	0 = direct connection	1	2	
Last mile to the hotel	on foot	bus	hotel shuttle	
	Choice	Choice	Choice	Choice

Figure 1. Example of a choice task.



Figure 2. Visualization of the TITRAG app with its features.

The DCE were followed by a set of questions on demographics, everyday mobility, information search behavior, and attitudes towards technology and environment. All in all, we collected data from 293 participants, and obtained 266 complete responses, of which 66% are from Germany, 27% from Austria, 5% are Dutch, and 1% are Swiss.

### **Initial results**

Using the data collected, we estimated three hierarchical Bayesian (HB) models to obtain the part-worth utilities of all attribute levels, and calculated willingness-to-pay (WTP) values.

The main finding evident in the choice models is that mobile apps (such as TITRAG) providing information and booking features for tourist mobility, *do not have a substantive impact on the choice* of destination or mode of transportation. When making a choice, tourists first consider other more important factors such as e.g., travel time or costs.

As far as destination choice is concerned, visitors view hiking opportunities, price of accommodation and quality of local public transportation more important than other activities and infrastructure.

When choosing a train service, travel price, travel time, and number of transfers are the critical factors. Passengers would be willing to pay 67.74 euros to reduce the number of transfers from two to zero. This preference for direct convenient connections may be due to the luggage carried and stress associated with changing trains (finding a platform, risk of delays, etc.). A similarly high value of convenience can be observed at the last mile section. Visitors are willing to pay 27.71 euros to be picked up by a shuttle and driven directly to the hotel. Moreover, when choosing transport mode, the opt-out option was selected much more often than in the destination choice. Expressed in willingness to pay, guests would have to be paid 42.85 euros not to use their cars for the long-distance trip to the destination.

In intra-destination travel, cost, bus frequency and walking time to and from a stop are the most decisive factors. Visitors would be willing to pay 4.25 euros for a bus service running with 30 min frequency, instead of 60 min, and 5.66 euros for a walking time reduction from 20-30min to 5-10min. An interesting result can be derived from the WTP of the opt-out option. The willingness to pay for this alternative is -2.11 euros, which means that visitors would have to be given this money to switch from personal vehicles to public transportation. This suggests that tourists may be quite willing to travel by public transport on site, yet they strongly prefer personal vehicles for the long-distance trip.