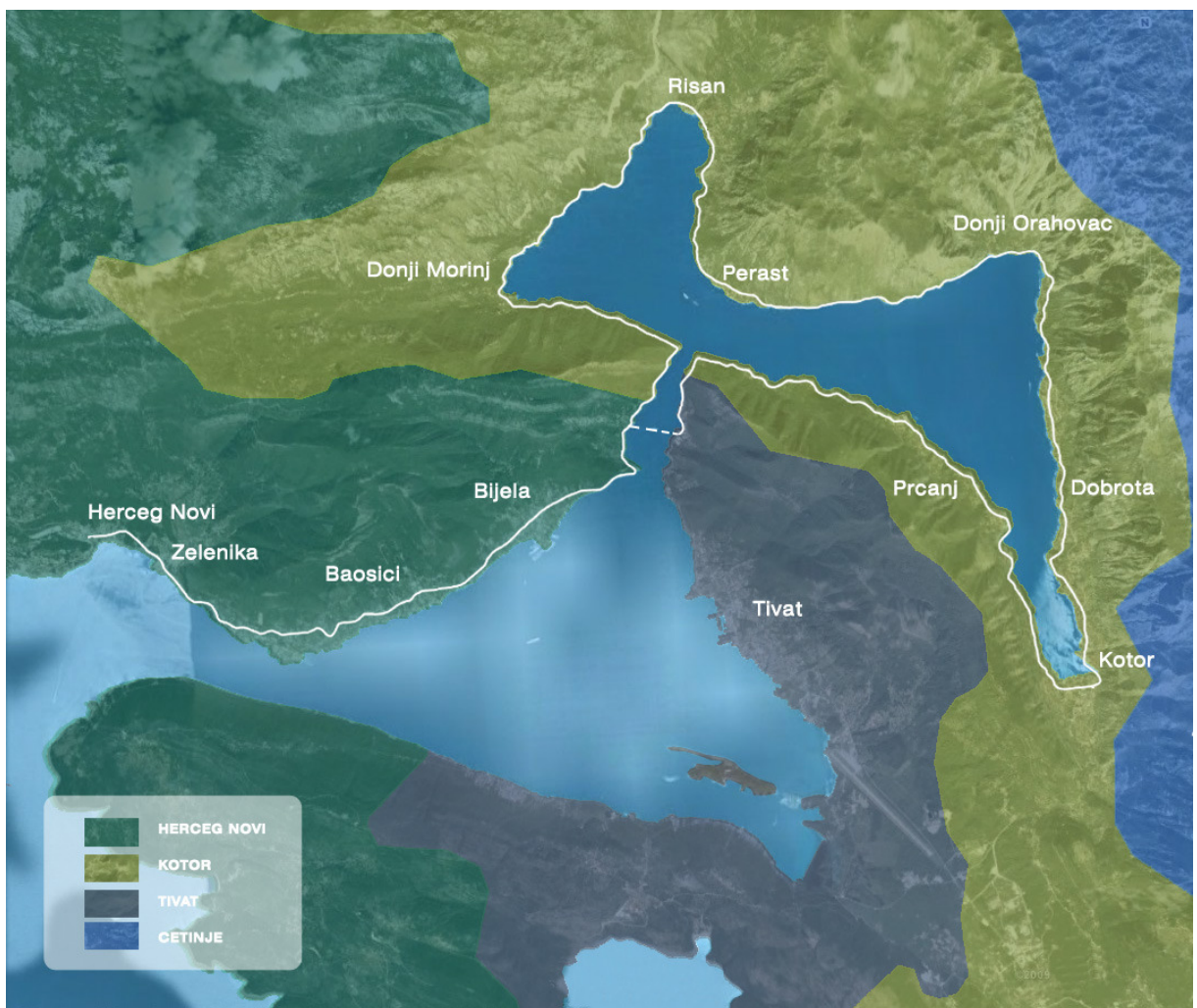


SUSTAINABLE MOBILITY IN THE COASTAL AREAS DEVELOPMENT OF A BIKE SHARING SYSTEM IN THE BOKA KOTORSKA BAY

1 INTRODUCTION

The natural and culture historical region of Kotor has been declared by UNESCO as a World Heritage Site on the basis of the natural beauties and historical monuments available in the area. However, the infrastructure system in the area poses particularly serious problems and the ever-increasing and unceasing tourist traffic coupled with the lack of a long-term vision for the development of the transport system has caused an unacceptable pressure from the tourist traffic, with inadequate transport solutions. Since the sustainable growth and development of healthy and livable areas comes in part through a reduction in auto dependency and the support and further development of alternative modes of transportation, the design and the development of a sustainable mobility system for the area, aimed at improving the possibility to enjoy the local tourist resources and natural beauties, limiting the use of private cars and implementing tourist services, is considered as a priority to reach the goals of the National Strategy for Sustainable Development of Montenegro. Bicycle travel has played an historic role in transportation. Increasingly, transportation officials throughout the world are recognizing the bicycle as a viable transportation mode. While recreational cycling is still the primary use of bicycles, the number of people using bicycles for commuting and other travel purposes has been increasing. Worldwide, people are recognizing the energy efficiency, cost effectiveness, health benefits and environmental advantages of cycling.



Bike Sharing System Preliminary Route

This comprehensive cooperation project concerning the sustainable mobility in the coastal areas of Montenegro is thus aimed at integrating the present transportation offer in the area with the development of a more efficient and environmental friendly mobility system, conserving and improving the environment and local communities. Specifically, the project will be focused on the development of a bike sharing system covering the Kotor Bay area.

2 PROJECT OBJECTIVES

A public bicycle system is a bank of bicycles that can be picked up and dropped off at numerous points across an urban area. The bicycles are available to the general public for short-term use for free or for a small fee. The concept has been widely embraced in Europe over the last decade and is generating considerable interest in North America. Recent European experiences suggest that public bicycle systems can act as a door opener for increased bicycle use.

Bike sharing offers rapid and flexible mobility for short distance trips; as such, it can be an attractive alternative to public transit and car. For longer distance trips, it can complement rather than replace public transit, creating opportunities for transit-bicycle intermodality. Given that public bicycle trips can help converting motorized trips to non-motorized trips and, ultimately, increase the mode share of cycling, they can be regarded as a strategy for reducing fossil fuel consumption and greenhouse gas emissions. They can also be regarded as a means for encouraging physical activity among the local population and are therefore consistent with efforts to improve the health of the population. On this basis, taking into account the pillars of the sustainable development, the main objectives of the project can be summarized as follows:

- strengthen bike based tourism with increased retail sales (restaurants, lodging establishments, and retail stores), job preservation and creation and, in the case of dedicated bike paths or trails, enhancement of nearby property values;
- improve traffic conditions reducing traffic congestion, improving safety of road infrastructure;
- provide direct environmental benefits, connected with improved air quality and energy conservation;
- increase quality-of-life due to increased opportunities for cycling and connectivity within a community.

3 SCOPE OF WORK

In order to successfully develop the project, the following activities are envisaged:

Activity 1: System Configuration

The study will first evaluate the following aspects:

- area topography and climate;
- size and density of the potential users;
- levels of bicycle use;
- existing roads and bicycle facilities;
- potential for transit intermodality;
- market research.

Beyond helping to determine the overall feasibility of the bike sharing system in the Kotor Bay area, the preliminary assessment will help determining the nature of the business model that could be used for the system implementation.

Based on the outcomes of the preliminary assessment, the system configuration will be developed based on the following activities:

- stakeholders identification and engagement;

- mobility study aimed at determining the spatial distribution of public bicycles and stations. The study will consist in collecting information about a large number of trips taken within the study area taking specifically into account: origin and destination, time of day and day of the week, the mode chosen (or modes in the case of an intermodal trip), age of the trip maker and trip purpose;
- service area and system size definition: the mobility study will be used to determine the ideal service area for the public bicycle system. Once the service area has been determined, it will be necessary to determine the appropriate number of bicycles to be used in the system;
- bike station distribution plan: tailoring the system to match expected demand is crucial because excessive or insufficient station capacities could be expensive to correct. As a general rule, stations should be distributed at points or in areas that are strong trip generators. Such places are likely to include the following: historical/tourism villages, attractive beaches, boat stations, etc. Once the approximate spatial distribution of stations has been determined, finer-grained considerations must be made to determine the precise location of the stations. Generally, stations should be placed in highly visible and accessible locations, where users can easily find them;
- marketing strategy definition: an effective marketing strategy is essential for attracting new users to the public bicycle system, especially when the system is first being launched. Most existing public bicycle systems have devoted considerable effort towards: building a highly recognizable, unique brand and developing a local identity a major promotional effort prior to the system's launch, with the objective of creating awareness of the service and driving subscriptions.

The conceptual design of the whole system configuration will be submitted to the competent authorities for approval, prior to proceeding to the system detailed design.

Activity 2: System Design

The system design phase will essentially deal with the following topics:

- system operation type definition. Bicycle sharing systems can be divided into two broad categories: manual and automated. A manual bicycle sharing system is one where transactions related to taking out and returning a bicycle are supervised. In an automated bicycle sharing system, transactions related to taking out and returning bicycles are unsupervised. Bicycles are either locked to special electronically controlled racks or are equipped with an electronically controlled lock of their own. By definition, automated systems rely heavily on information technology for user interface, system control and monitoring;
- bike and stations design. System stations are composed of two basic components: a service terminal and a set of bicycle locking stands. The service terminal provides a user interface for performing basic financial transactions related to the purchase of user memberships, provides information about how to use the system, and about the availability of bicycles and docking spaces at other stations. The design considerations for public bicycles are: ease of use, adaptability to users of different sizes, mechanical reliability, resistance to vandalism, theft prevention and distinctive visual appearance.
- human and capital resources requirements identification. Significant human and capital resources are needed to keep the system running. The staff required for the following general functions should be defined:
 - fieldwork: redistribution of bicycles, station maintenance and minor bicycle repairs,
 - workshop: major bicycle repairs,
 - warehouse: storage of spare parts, spare bicycles, and other equipment,
 - call centre: subscription management and customer assistance.

A public bicycle system requires more than just bicycles and stations; the need for other equipment to keep the bicycles and stations functioning at an adequate level of service should be identified including:

- fleet of vehicles for redistribution of bicycles between stations, station maintenance, and light bicycle maintenance,
- warehouse facilities for heavy bicycle maintenance, for storage of spare parts and spare bicycles and, in colder locations, storage of bicycles and other equipment if the system shuts down in the winter,
- IT equipment for monitoring the status of the stations and the locations and status of bicycles,
- a logistics centre for coordinating redistribution, maintenance, and repair operations as well as for customer service.

The technical documentation will be developed in compliance with the requirements of the Montenegrin laws, in order to obtain all necessary authorizations.

Activity 3: Pilot Section Installation and Start Up

Once the design will be defined and authorized, the system implementation phase will begin. This activity will be focused on the procurement of the items in the approved supply list and in the installation of the components and in any civil work foreseen by the detailed design for a pilot section identified as the most suitable for the system start up and testing.



Preliminary Identification of Potential System Section and Pilot Area

Following the installation and configuration of the Pilot Section in all its components, the Pilot Service will be started-up in full collaboration with the local stakeholders. Local operators shall

be trained for system operations and full assistance shall be provided in order to validate the initial results.