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Transport effects and environmental consequences of central workplace location

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Abstract

This paper presents results from a study of traffic effects and environmental consequences of locating 12 500 new workplaces in the development area Bjørvika, close to Oslo central station, rather than locating them as the current distribution of workplaces in Oslo. It was found that this annually saves Oslo about 1.7 million car-trips and 24 million vehicle kilometres by car, and hence 4 GWh of energy consumption, 2800 tonnes CO₂ emissions, 5 tonnes NO_x, and 1.5 tonnes NO₂.

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1. Introduction

This paper presents results from a study of transport effects and environmental consequences of locating workplaces near central urban public transport stations, rather than elsewhere in the urban structure.

The study was conducted as a commissioned work for Rom Eiendom AS (referred to as Rom below), responsible for developing the Norwegian National Rail Administration's properties in several Norwegian cities (the study is reported in Tennøy, Øksenholt and Aarhaug, 2013). These properties are normally located in or close to city centres, and often in direct proximity to the central railway stations and other public transport nodes. Working out their strategy

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for developing and transforming these properties, Rom needed a sound knowledge base for assessing transport effects and environmental consequences of such developments.

On basis of existing literature and previous studies, central nodal point developments are expected to generate less traffic volumes and negative environmental impacts, than if activities are located elsewhere in the urban structure. This has been a main argument for large-scale developments close to central railway stations in European cities like Zürich, Lyon, Amsterdam, London, Paris and Stockholm (Bertollini, 1998; Bertollini et al., 2012; MVA, 2005; Peters and Novy, 2012; Wolf, 2012). This was also a main argument in discussions concerning the large-scale Bjørvika development, located between Oslo Central station and the Oslo fjord, where Rom is a major developer. In this project, a subsea tunnel was constructed, replacing a major road carrying about 100 000 vehicles per day. This freed large areas in the centre of Oslo for urban development. The area is now under construction. The new Opera and several office- and apartment buildings are already built. Fully developed, the area, covering about 70 hectare, will have room for 15 – 20 000 workplaces and about 5 000 apartments, as well as shopping and service, the new Main City Library and the new Munch museum.



Fig. 1. The Bjørvika development area (Barcode), located between Oslo central station and the Oslo fjord (photo: Tomasz Majewski).

The commissioned work included a literature review concerning traffic effects and environmental consequences of locating new urban developments in different parts of the urban structure, as well as an empirical study analysing traffic effects and environmental consequences of locating 12 500 new workplaces in Bjørvika in Oslo city centre (as Rom does), rather than locating them as the current distribution of workplaces in Oslo. Only employees' travels to and from work was considered. Environmental consequences related to car-usage as well as public transport were included.

The initial aim of this study was to produce a sound knowledge base helping Rom to assess transport effects and environmental consequences of various ways of developing their properties. This concerned mainly what type of activities they should locate in their centrally located properties and the density of the development, in order to contribute to national and local objectives concerning to reduce car dependency, traffic volumes and transport-related consequences.

Another aim of the paper is to contribute with relevant knowledge for decision-makers and planning practitioners in other countries and cities, who are aiming at steering land use and transport systems developments in directions contributing to less traffic and transport-related environmental consequences. Stopping or reducing traffic growth is a long-standing objective in a number of cities, countries and international institutions (e.g. European Union, 2011; Municipality of Oslo, 2008; Norwegian Ministry of Environment, 2012; Norwegian Ministry of Transport and Communications, 2013; World Bank, 2002). The arguments for this include reducing local pollution, congestion, land

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