Development of an internal shuttle bus network for the BMW FIZ in Munich North
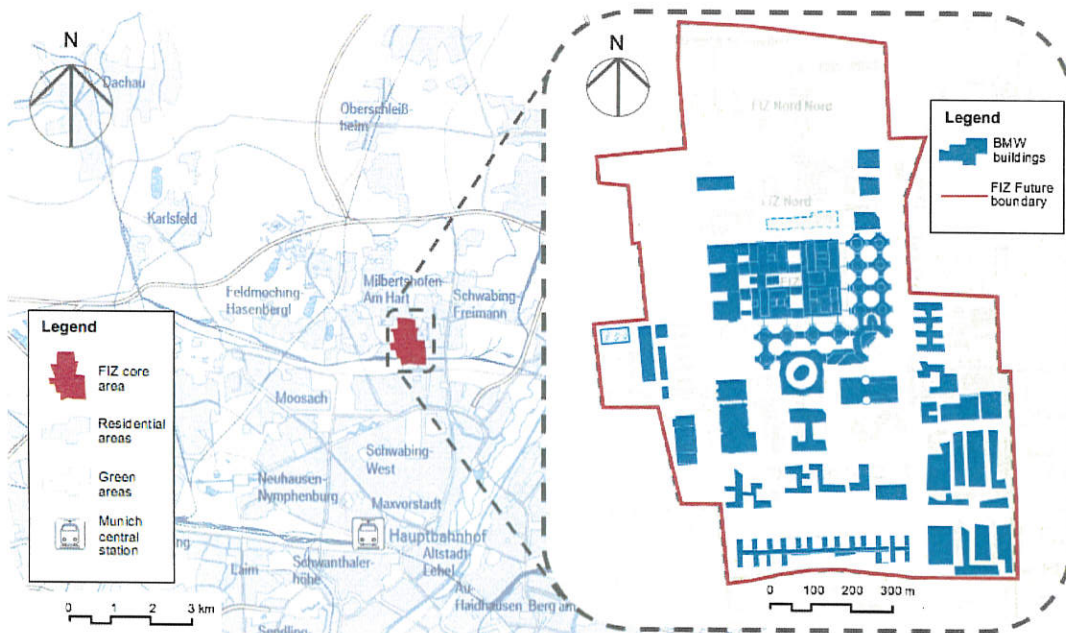
Master's Thesis von Juan Elízaga

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Location and general layout of the FIZ

The Forschungs- und Innovationszentrums (FIZ) represents the main pillar of research and development that BMW has across Europe and in the whole globe. It is located in the north of Munich, in the neighborhood of Miltbertshofen. This resort is completely integrated into the urban area, as the BMW buildings are located in such a way that the public street becomes part of the employees' daily trips around the FIZ.

The red area represents the limits that define the future expansion that BMW Group is planning for the FIZ. Although the resort is not completely covered, in blue are highlighted the buildings that nowadays belong BMW, and which represent the available area for the bus network. In addition, the map gives an idea of the size and distances that the employees need to cover when making work trips from one office building to another

Distributions of trips per hour on the base scenario

The figure on the right displays the distributions of trips across the network after the implementation of the OD matrix into the VISUM program.

The bars on red represent the flows of pedestrians that travel from one building to another on a work basis. It is remarkable the high number of employees that need to travel the whole way from the East side of the FIZ to the opposite side, incurring in trips lengths longer than 800 meters.

The thesis aims to develop a bus line system in order to offer an alternative mode of transportation for the employees of the FIZ, and to provide a faster way to perform the longest trips within the FIZ area.
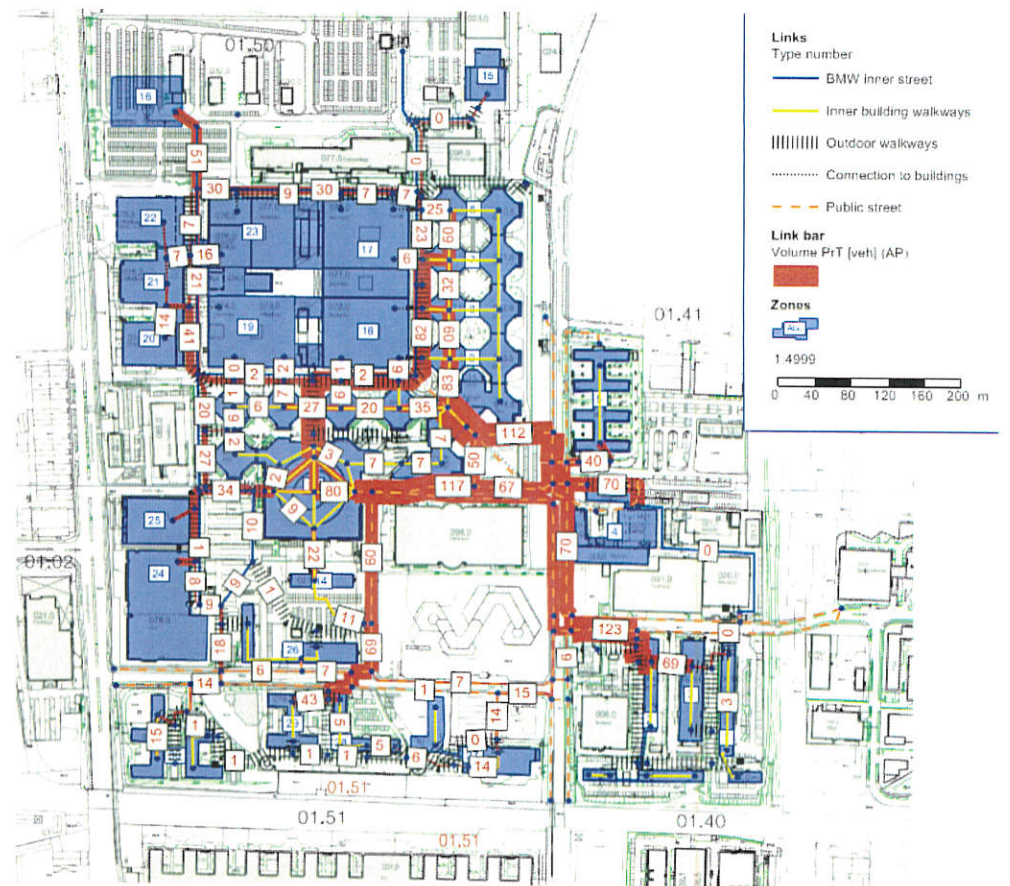
Distance isochrones of the bus stops in one analysis scenario

To select the best possible alignment of stops and design of bus routes, the thesis compares a total of ten scenarios (eight for a conventional bus operation line, and two for a demand responsive transport operation type) among which the availability of the bus line is measured.

The figure on the left depictures the time accessibility to each of the available stops of this particular scenario. This tool combined with the number of employees per building delivers the percentage of persons that have an available stop within a specified period of time.

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