



## Designing buildings to deliver city densification over transport infrastructure

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## 1 Abstract

New York City constitutes one of the most extreme cases of urban concentration due to land scarcity. The development of skyscrapers has been one of the solutions to address the problem and, more often than not, new structures are being built directly over the extensive network of underground infrastructure in the city.

The presentation showcases the experience and lessons learned from a selection of projects in the US and UK located directly on top of existing infrastructure. Examples include NYC transit projects spanning from the 1990s, when nine buildings along Riverside Boulevard and on top of the former Penn Central rail yards were developed, to the ongoing Atlantic Yards/Pacific Park project where up to six buildings will be erected on top a 320,000sqft platform over train tracks. Amongst other projects, the presentation will include the Hudson Yards development on the east side of Midtown Manhattan located over the subway entrance to the 34th Street station and the Waterline project built over the AmTrak and LIRR train tracks. In the UK case studies include two recent London projects at Royal Mint Gardens and Principal Place. The general focus is aimed at the structural strategies employed and their impact not only in construction costs but also the long-term effect in the urban fabric.

**Keywords:** Rail, overbuild, decking, rafting, densification, ToD, regeneration, urbanisation, infrastructure.

## 2 Introduction

New York City is certainly an extreme example of urban concentration. The quantity and proximity of tall buildings in a mature city is unparalleled and where possible, further towers are being added constantly. Over the years, some of these buildings have been constructed over ever more complex infrastructure in the most valuable locations stretching the skills of engineers and contractors. However, New York is not alone in this endeavor and there is now considerable evidence that in large mature global cities the challenges of this type of

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