



## Build with weathering steel: environmental and economic impacts – Tramway Bridge in Paris suburbs

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### Abstract

The new tramway line T7 is located in Paris South suburbs; the line is 11 km in length. Many new bridges were built; the main one is a composite bridge crossing the A86 motorway. The deck is a composite box-girder made of weathering steel and reinforced concrete slab. High constraints for road operation have been imposed by the A86 motorway administrator. A multi-criteria analysis of different bridge solutions, including a life cycle cost analysis, demonstrated the economic and environmental interest of using weathering steel for the deck.

**Keywords:** planning, weathering steel; tramway; environmental impact; composite deck.



*Figure 1. General view of the main bridge and South ramp*

### 1 Introduction

The new tramway line T7, running on exclusive lanes, links Villejuif-Louis Aragon (Val de Marne) to Athis-Mons (Essonne). This 11 km line with 18 stations was opened in November 16th 2013. It serves many business parks and the shopping center of Belle-Epine. SYSTRA was part of the project manager JV in charge of the design: SYSTRA, SETEC, architectural firms REICHEN & ROBERT and LAVIGNES-CHERON. SYSTRA was the project manager of lot 1 (tracks, systems, contact system, power traction) and lot 2 (engineering structures). In total, two existing bridges were modified and five new bridges were designed. The

paper presents the bridge crossing the motorway A86 and the roadway RN186, so called “OA2”. The purpose of this paper is to show through an example the interest of using weathering steel in a strained public setting, to limit the environmental impact of a bridge in a global life cycle (in particular during construction and future maintenance). This paper reviews project constraints, design studies, and final crossing solution held after multicriteria analysis. It also outlines the development of the scheme, demonstrating the improvements made to the access and appearance of the structure as well as the lowering of future maintenance requirements. Key points of the structural design are presented,