

## ABSTRACT

Title of Thesis: THE USE OF RAILROAD ECONOMIC THEORY  
IN THE DESIGN OF A HIGHWAY  
THE PULASKI SKYWAY IN THE STATE OF NEW JERSEY

Degree Candidate: Dara Callender

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Thesis Directed By: Professor Emory Kemp, Ph.D.  
Center for Graduate and Continuing Studies  
Goucher College

The Pulaski Skyway in northern New Jersey is a striking and attractive example of the early modern “superhighway” in the United States. Its construction was critical to the reinforcement of regional industrial growth and to the flow of persons and goods into the City of New York. The design of the route followed over three decades of growth in the development of state and national motor vehicle road systems, experimentation in new roadway planning methods, and expansion of highway engineering capabilities. The viaduct is an important structural engineering accomplishment. However, it is even more significant as a pioneer example of railway economic analysis transformed for use by highway planners.

This work was undertaken to determine the extent to which railway economic practice was utilized in the Pulaski Skyway design, and whether or not the project was the first in the nation based on such theory. To place the Skyway in its historic context, research was undertaken on the development of roads, road agencies and organizations, and the road design progress beginning in the late 1800s. Documentation was compiled regarding the regional and national significance of northern New Jersey industry and transportation, and state records were analyzed for information on the establishment and work of the New Jersey State Highway Department, which planned the Skyway project.

Key to the compilation of information on the method of economic analysis and the definition of the Skyway's role in United States highway economic planning was the thorough review of both the railway theory, as defined in 1887 by Arthur Wellington, and the highway theory as defined by project engineers Frederick Lavis and Sigvald Johannesson. In addition, extensive review of the engineering documentation of the 1920s and early 1930s was utilized as a means of placing the project in perspective through the analysis of the writings of highway engineers of the period.

The analysis and research undertaken in the preparation of this work unquestionably indicates that the Pulaski Skyway was designed using railroad economic methodology as applied to highway design. Period engineering literature indicates that the project was the first in the nation to use such theory, and that the Skyway design utilized the most extensive economic analysis in practice at the time. The Pulaski Skyway was also the largest highway project ever undertaken in the United States at the time of its planning, and served to educate and motivate members of the highway engineering profession in the use of economic analysis and the design of the modern "superhighway."