Accelerated Construction of Urban Intersections with Portland Cement Concrete Pavement (PCCP)

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Abstract: The frequent maintenance required on some asphalt concrete (AC) pavement sections has made reconstruction with Portland Cement Concrete Pavement (PCCP) a feasible alternative. However, many constructability issues need to be addressed in order to realize the full potential of this alternative. Accelerated paving encompasses three classes of activities: methods to accelerate the rate of strength gain, methods to minimize the construction time, and traffic control strategies to minimize user delay. In this paper a case study will be presented in which an AC intersection was reconstructed with portland cement concrete pavement. The entire reconstruction of the intersection, including demolition of the AC pavement and its replacement with PCCP, took place over a period of three days, starting on Thursday evening and opening the intersection to the traffic on Sunday afternoon. This paper documents this effort in order to provide practitioners additional options for rapid reconstruction of urban intersections and includes documentation of the construction process, traffic management strategies, and an analysis of the costs. The results of this investigation can be used to educate pavement construction professionals and the academic community on the use of PCCP for accelerated reconstruction of major urban intersections with minimal user and traffic disruption, using innovative construction techniques and traffic management optimization principles. This investigation produced valuable information to demonstrate that concrete pavements can be constructed efficiently and quickly.

Keywords: Concrete, accelerated construction, pavement, portland cement concrete pavement, maturity method.