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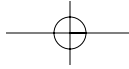
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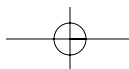
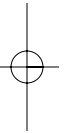
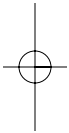
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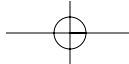


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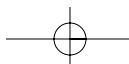
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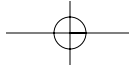




## LIST OF EXHIBITS

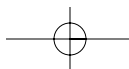
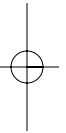
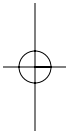
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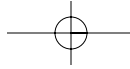




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## FOREWORD

This monograph describes a wide variety of “unconventional” intersection design, operation and management principles, and explores the role that they can have in improving operational efficiency on arterial roadways.

In many urban and suburban areas across the United States, principal arterial roadways are unable to adequately serve increasing travel demand, particularly along highly developed corridors. Long-distance trip efficiency is lost, even at off-peak hours, as motorists suffer stop-and-go traffic conditions between intersections. Of the many potential operational control factors on the arterial, the congestion experienced at signalized intersections can have the greatest impact on arterial travel efficiency.

Unconventional intersection designs share common principles in emphasizing through-movements along the arterial, eliminating some signal phases, and reducing and separating conflict points to improve operations, efficiency and safety at intersections and potentially along the whole of the arterial. Unconventional designs also offer the potential for lower costs and reduced environmental impacts, particularly when compared to traditional widenings or converting at-grade intersections to interchanges. As transportation agencies and communities seek long-term solutions to arterial congestion, there is new and greater continuing interest in unconventional intersection design as potential congestion and growth management solutions. However, to date, there is no authoritative reference for professionals that addresses a range of unconventional design, operation and management principles.

This monograph was developed to serve as such a reference, to present a menu of unconventional at-grade and grade-separated intersection designs with potential to improve certain types of high-volume arterial intersections. Chapter 1 examines the current need for new approaches to reducing intersection congestion, and identifies deficiencies in current conventional intersection design, operation and management practice at high-capacity intersections. Chapter 2 explains unconventional intersection design, operations and management principles in detail. Chapters 3-5 present unconventional intersection and interchange designs used regionally or in isolation throughout the US, as well as newer research into unconventional designs yet to be implemented. Chapter 6 examines implementation issues, including building public awareness, motorist acceptance, use of operations analysis software, and potential design impacts and benefits.

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### Technical Mentorship Team

**Hal Kassoff** serves as Parsons Brinckerhoff's Highway Program Area Manager and was formerly Director of Planning and Preliminary Engineering and then Administrator for the Maryland State Highway Administration. Hal's wealth of public and private sector transportation planning and design experience combined with his contributions to the concept of "sustainable highways" made his mentorship and review of this research invaluable.

**Joseph E. Hummer**, Ph.D., P.E., Professor of Civil Engineering at North Carolina State University. Dr. Hummer has researched unconventional intersection and interchanges for 12 years and has developed three new unconventional designs. He has authored 14 papers and presented at many technical conferences on unconventional design.

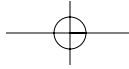
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**Tracey Nixon**, AICP, is a transportation planner in Parsons Brinckerhoff's Indianapolis office. Tracey has worked on a number of highway and transit studies throughout the US, writing environmental documents and preparing informational materials for the public. Tracey provided invaluable technical edits for this monograph and brought an experienced planners' perspective to this topic.

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