# Contents

ix List of figures
xiii Foreword
xv Preface
xix Acknowledgments

3

## Part I: Understanding the technology

Chapter 1 System design process

System architecture design for GIS
Why it's important
Success with GIS
What is the system design process?
Planning for success

15 Chapter 2 Software technology

ESRI software evolution
Organizational GIS evolution
ESRI product family
Expanding GIS technology trends
GIS technology today
GIS software selection
GIS architecture selection
Selecting the right technical solution

37 Chapter 3 Network communications

Network components and GIS operations GIS communication protocols Network communications performance Shared network capacity Network configuration guidelines

51 Chapter 4 GIS product architecture

ArcGIS system software architecture ArcGIS Desktop client/server configurations Web services architecture Web platform configuration strategies Selecting the right architecture

69 Chapter 5 Enterprise security
Selecting the right security solution
Security and control

Enterprise security strategies Web firewall configuration alternatives

#### GIS data administration 81 Chapter 6

Storage architecture strategies Ways to protect spatial data Ways to back up spatial data Ways to move spatial data Ways to manage and access spatial data

### Part II: Understanding the fundamentals

Performance fundamentals 101 Chapter 7

> Learning from experience What is capacity planning? What is system performance? System performance fundamentals Platform utilization Capacity planning models

Chapter 8 Software performance 117

> Programming and performance Map display performance Selecting the right image format Providing the right data source Building high-performance Web applications Selecting the right physical memory Avoiding disk bottlenecks ArcGIS Server cache: The performance edge

147 Chapter 9 Platform performance

> System performance baselines User productivity Measuring platform performance Impact of platform performance ArcGIS Desktop platform selection Server platform sizing models Windows Terminal Server platform sizing GIS data server platform sizing Web mapping server platform sizing Platform selection criteria

### Part III: Putting it all together

#### 175 Chapter 10 Capacity planning

Capacity Planning Tool user interface Requirements Analysis Module Platform Selection Module Workflow tab Hardware tab

#### 227 Chapter 11 Completing the system design

GIS user needs assessment City of Rome user requirements analysis City of Rome system architecture design review Year 1 capacity planning Year 2 capacity planning Year 3 capacity planning Choosing a system configuration

#### 253 Chapter 12 System implementation

GIS staffing System architecture deployment strategy Data center architecture System testing Management System tuning Business continuance plan Managing technology change

#### 263 **Appendixes**

Appendix A: System performance history Appendix B: COTS security terms and procedures

#### 269 Acronyms and glossary

#### 281 Index