

# Contents

Preface ix

## **PART I**

### Introduction to Transportation Geography

#### **1** Transportation Geography and Spatial Organization 1

Linkages 5  
Nodes 12  
Hinterlands 18  
Hierarchies 26  
The Development of Transportation  
Networks 38  
Summary 43  
Selected References 43

#### **2** Selected Economic Aspects of Transportation Geography 44

Comparative Advantage 44  
Regional Specialization  
and Transportation 46  
Transport Cost Graphics 48  
Freight Rate Structures 52  
Spatial Price Equilibrium 59  
Agglomeration Economies 64  
Transportation and the Location  
of Economic Activity 65  
Summary 72

### **3** The Evolution of the U.S. Transportation System I 73

Transport and Spatial  
Organization 73  
Transportation and Economic  
Development 74  
The Political Context  
of U.S. Transport Development 76  
The Four Eras of U.S.  
Transportation Development 76  
Summary 107  
Selected References 108

### **4** The Evolution of the U.S. Transportation System II 109

Transportation and Spatial  
Organization 109  
Transportation  
and Development 111  
The Political Context  
of U.S. Transportation 112  
From the Turn of the Twentieth  
Century to World War II 113  
After World War II 118  
Summary 138  
Selected References 142

### **5** Selected Trends in U.S. Transportation: Airline Deregulation and Intermodal Transfer 143

Airline Deregulation 143  
Containerization  
and Intermodalism 155  
Intermodalism 160  
Summary 165  
Selected References 165

### **6** Urban Transportation 166

Accessibility 166  
Transportation and Spatial  
Form 167  
Other Factors 172  
Transportation Technology  
and Spatial Form 174  
Metropolitan Chicago:  
An Empirical Example 179  
Spatial Interaction 184  
Commuting and Jobs 186  
Urban Mass Transportation 187  
Summary 191  
Selected References 191

---

## **PART II**

### **An Introduction to Transport Analysis**

#### **7** Spatial Interaction I: The Basic Model and Its Applications 195

The Basic Gravity Model 196  
The Gravity Model  
and Linkages 197  
The Gravity Model and Nodal  
Characteristics 203

Hierarchies and the Gravity  
Model 219  
Modifications of the Basic Gravity  
Model 223  
Traffic Demand and Spatial  
Interaction Models 228  
Summary 229  
Selected References 230

## 8 Urban Transport Analysis I 231

- Urban Transportation Planning  
Process 231
- Urban Transportation Model  
System 233
- Summary 247
- Selected References 248

## 9 Network Analysis I 249

- The Network as a Graph 249
- Full-Network Measures—  
Connectivity 250
- Individual Measures—Matrix  
Relationships 255
- Summary 285

## 10 Allocation Models 287

- The Transportation Model 288
- Empirical Examples  
of the Transportation Problem 296
- Variations of the Basic  
Transportation Problem 300
- Sensitivity Analysis 314
- Summary 314
- Selected References 315

---

### PART III

#### Selected Approaches to Transport Analysis

## 11 Spatial Interaction II: Selected Models 319

- Constrained Models 319
- Spatial Structure and the  
Competing-Destination Model 327
- Logit Models and Spatial  
Interaction 336
- Summary 339
- Selected References 339

## 12 Urban Transport Analysis II: Behavioral Models 340

- Challenges to UTMS 340
- Behavioral Models 342
- Summary 359
- Selected References 361

## 13 Network Analysis II: Linkages and Hub-and-Spoke Systems 362

- Network Analysis of a Regional  
Highway and Truck Transport  
System 362
- Network Analysis of Hierarchical  
Linkage Systems: Phone Calls  
and Air Traffic 364
- The Routing Algorithm 367
- Hub-and-Spoke Networks 372
- Toward Optimal Hub Network  
Design 379
- Summary 387
- Selected References 387

## **PART IV**

### **Conclusions**

# **14** Summary and Outlook 391

Basic Spatial Organization  
Concepts 391

Some Recurrent Economic  
Concepts 394

Outlook 396

Some Final Comments 400

Statistical Appendix 402

Index 412