Introduction

Traffic has a powerful effect on our quality of life. If you live in a metropolitan area, you probably think the roadways have too much traffic at least some of the time, and perhaps all the time. Excessive traffic interferes with our ability to go where we want, when we want. It makes urban roadways ugly, noisy, and polluted, and the adjoining spaces inhospitable. The quality of urban life is also affected by speeding traffic. Speeding makes roadways more dangerous and distressful, and discourages walking and bicycling. Excessive traffic volume and velocity make communities less livable.

The problem of excessive city traffic has been with humankind for a long time. It vexed the poets and emperors of ancient Rome. It became widespread during and after the Industrial Revolution, as large urban agglomerations grew in Europe and America. It has been with us so long that it might qualify as one of life's certainties, along with death and taxes. Reckless drivers speeding in cities were also a chronic annoyance. When automobiles became common in cities, the annoyance escalated into an urgent problem.

Excessive traffic volume and velocity conflicted with livable roadways, and the conflict was fundamental. It motivated a perennial effort to invent new urban forms as solutions. City visionaries, architects, engineers, and officials consistently used one basic idea to guide that effort. The idea was *functional traffic separation*.

Functional traffic separation is the separation of different types of traffic according to their functions; that is, their roles or purposes in the transportation realm. Certain varieties of functional traffic separation have been most common in urban history. For instance, slow traffic was separated from fast traffic. Local traffic was separated from longer-distance traffic. Business traffic was separated from pleasure traffic. Walkers were separated from drivers.

A History of Street Networks is a survey history of that concept: the many visions, projects, and policies that separated city traffic in myriad ways. It is a story of far-reaching reform, as dreamers, designers, engineers, and business interests sought to remold urban environments into new and radically different patterns. And it is a story of countermovement, as critics attacked some of the most extreme types of traffic separation and sought a more moderate balance of old and new.

The idea was contentious because the consequences were substantial. Functional traffic separation was a powerful shaper of the built environment in cities. It helped determine the configuration of roadways and the layout of roadway networks. It helped determine whether an area developed as a well-connected, continuous fabric or an atomized scatter of insular pods. It affected many aspects of urban life including convenience, efficiency, prosperity, comfort, health, pollution, and safety. It had important implications for urban sustainability, long-term adaptability, and other quality-of-life issues.

The effects of traffic separation promised to be long-lasting because roadway layouts were the most permanent built elements of cities. They commonly lasted for centuries, and in some places, for millennia. Even as monarchs, empires, and nation-states rose and fell, roadway layouts endured and continued to affect the way cities functioned.

Since the early twentieth century, traffic separation has been fundamental to urban planning and engineering. It underlies the beliefs and visions that continue to shape built environments today—often without our conscious awareness. The more we can be aware of its influences, the better we can exercise self-determination and agency when imagining and building new urban places.

Book Overview

A History of Street Networks explores the origins and institutionalization of modern urban roadway configurations and networks, particularly those of suburban sprawl. The narrative covers the most important ideas and how they were modified and incorporated into new schemes. It is global in scope, but focuses on the places and periods of greatest innovation or influence: Western Europe, Britain, and America from the early nineteenth century to the present. The metropolises of Paris, London, New York, and Chicago have dominant roles in this history.

Chapter 1 is about traffic separation in the vertical dimension, and covers that history through the nineteenth century. Proposals to separate traffic vertically began to appear in earnest around the 1840s, as the Industrial Revolution reached maturity. The aim was to bring railroad speed to city streets. Advocates felt that speed was progress, and that layering rail transit and streets would improve city convenience and business activity. Toward the end of the century, a few visionaries created surprisingly precocious multilevel schemes for road vehicles.

Chapter 2 continues the vertical-separation theme through the early twentieth century. The proposals of the early 1900s responded to the accelerating pace of technological change, which included skyscrapers, automobiles, and mechanization in general. Now the advocates wanted to add automobile speed to city streets. They believed that vertically separated roadways would accelerate traffic, improve city environments, and promote prosperity. These projects and visions helped lay the foundations of urban futurism, and were sometimes inspired by a utopian urge.

Chapters 3 through 6 are about traffic separation in the horizontal dimension. Chapter 3 covers divided roadways, which have separate lanes for different traffic types. These were originally created as recreational facilities for aristocrats and nobility. Through the early twentieth century, they retained their associations with

higher social status, aesthetic quality, and recreation. They were often intended to induce genteel, upper-class suburban development.

Chapters 4 and 5 are about insular roadways, which are removed from general traffic circulation. They were prompted by a complicated set of motives. Advocates wished to exclude unwanted population groups, provide protection from traffic and disruptive behavior, or ensure superior social status. By the 1930s, traffic safety had become another primary motive. Although some of the leading advocates were inspired by anarchist-socialist political movements, in the United States the concept of insular roadway layouts was ultimately enshrined by big business and big government.

Chapter 6 is about fast roadways, which originated in road racing for recreation and social status. Around World War I, new justifications for fast roadways were asserted, such as congestion reduction, economic development, and safety. Advocates wanted whole regions to be structured by higher-speed parkways and expressways, which would usher in the automobile-commuter lifestyle.

Chapter 7 covers the phase from the 1920s to 1950s when traffic-separation concepts began to be blended and condensed. Advocates proposed visions, principles, and systems that were standardized for use at regional and national scales. The era of the singular visionary designer or planner was fading, to be replaced by professional organizations, government agencies, and powerful corporate coalitions.

Chapter 8 covers the emergence in the United States of the standardized system known as functional classification. It was codified and propelled by the automobile industry and highway engineers, and their allies. After years of coordinated lobbying, it was mandated nationwide. It helped shape the roadway patterns of American sprawl, and helped establish thousands of square miles of suburbs as utterly auto-dependent environments.

Chapter 9 covers various traffic-separation trends of the mid-twentieth to early-twenty-first centuries. During that period, the status-quo development practices that resulted in total automobile dependence were challenged by countermovements that sought to create more livable built environments. Roadway layouts were a significant part of those debates. A diverse range of traffic-separation methods contended for influence, each claiming to improve quality of life. Some were compatible with each other and some were not.

Chapter 10 concludes the history by evaluating the performance of traffic-separation practices. Specifically, it compares sprawling, disconnected roadway patterns to compact, connected roadway patterns. The former were originally justified by intuition and anecdote, and have not lived up to the promises made on their behalf. Historical knowledge can help avoid mistakes of this nature.

Timeline

Traffic-separation history has a discernable shape and arc through time. It goes from separate strands of visioning and experimentation, to consolidation and triumph, to criticism and countermovement, and finally to the present situation of diverse contending practices. The structure of *A History of Street Networks* reflects that timeline.

A History of Street Networks is generally arranged chronologically, but gives priority as needed to thematic cohesiveness. The first six chapters focus on similar

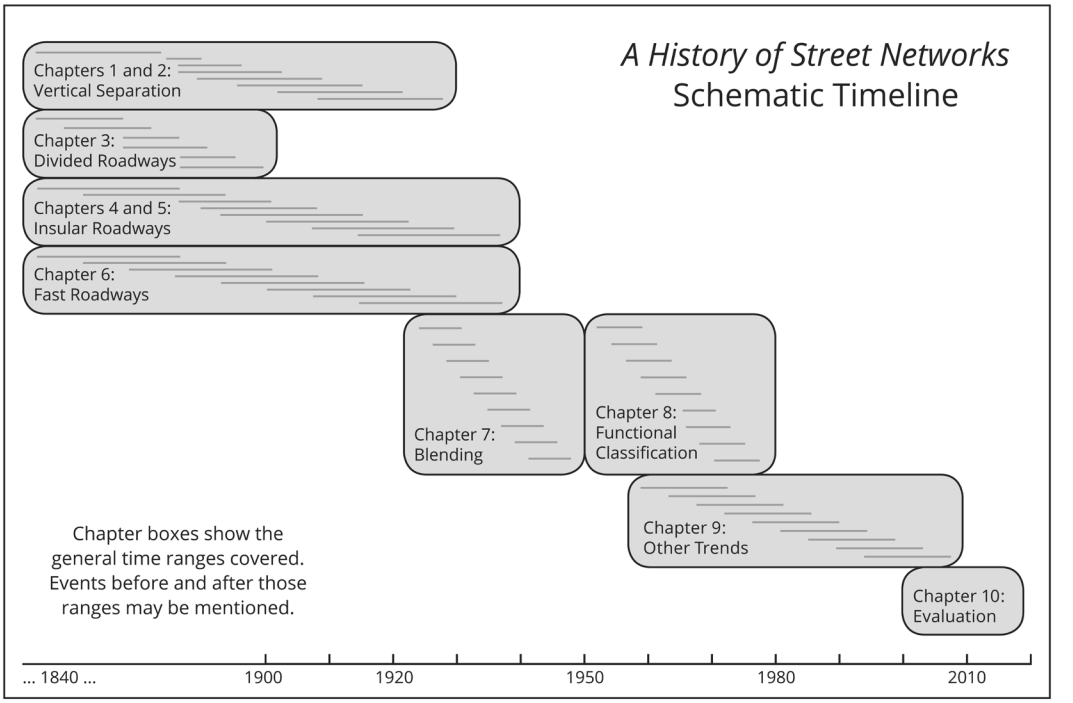

Figure 0.1: Schematic timeline of *A History of Street Networks*

time periods, from the early nineteenth century to the early or mid-twentieth century. Chapters 7 and 8 follow a more linear path through the mid- and late twentieth century. Chapter 9 overlaps much of chapter 8. Indeed, all the chapters overlap in time to some degree. Within each chapter, the profiles of people, projects, and initiatives are roughly chronological, and they too overlap in time.

Thus, the book recounts the early history of traffic separation several times. Each pass adds a new perspective and builds a more complete understanding. The overall narrative is like an oil painting whose image is built up from multiple layers of paint. Some topics are briefly sketched early in the book and are treated in greater detail in later chapters.

Filtered and Omitted Topics

Traffic planning is a mature field that encompasses centuries of writing and thought; a truly comprehensive narrative could fill a set of encyclopedias. *A History of Street Networks* purposely filters and omits many aspects of that voluminous history. It is concerned with cities and suburbs. It covers only the most innovative or influential visions, built projects, individuals, and ideas. It focuses primarily on spatial forms, dimensions, and patterns.

A History of Street Networks is mainly about vehicular facilities, and gives only a small amount of attention to bicycle and pedestrian facilities. The latter had little effect on the shaping of roadway networks. Even so, the decision to omit pedestrian facilities was difficult because the histories of vehicular and pedestrian facilities are often interlinked, and one cannot fully understand the history of one without the other. The omission was necessary to keep the book to a reasonable length and centered

on its main topic: the origins and institutionalization of modern roadway patterns.

Conventional bridges, tunnels, and viaducts are generally omitted from the discussions of vertical traffic separation that constitute chapters 1 and 2. Instead, those chapters focus on multilevel facilities that had the potential to engage their surroundings more fully and become active parts of a city's civic life.

The topic of geometric traffic separation is omitted. Geometric traffic separation divides traffic into different streams regardless of role or purpose. Some examples are medians, one-way streets, and channeling by means of painted lines, barriers, and traffic islands. Geometric separation may supplement functional separation, but is not a focus of this book by itself. Its influence on urban form was minor compared to the copious and comprehensive effects of functional traffic separation.

Author's Background and Aims

My interest in street networks began when I was a boy and my family moved from a suburban neighborhood to Washington, DC. A new world opened as I walked and biked the streets of DC. I learned how street networks could directly affect my independence and social life, and how street designs affected my sense of safety and civic engagement. I discovered that streets could be beautiful, comfortable, delightful spaces to be in.

In 1998 I joined the new urbanism movement, which is a reform movement in the fields of urban design, planning, and development. As a new urbanist, I advocated town and neighborhood layouts that were similar to urban places built before the 1930s—layouts that supported walking, bicycling, and transit, as well as accommodating cars. That orientation had a thorough influence on *A History of Street Networks*. It influenced the book's organization, selected topics, and highlighted themes.

Although the book is critical of the most extreme forms of traffic separation, it strives for an evenhanded treatment of the historical figures and their ideas. My hope is that readers will find *A History of Street Networks* informative and useful no matter what planning philosophy they favor.

A History of Street Networks was motivated by idealism and an urge to educate. I believe that a knowledge of traffic-separation history can help create better roadway layouts, which will improve the quality of urban life. The ultimate goal is roadway layouts, transportation infrastructure, and built environments that are more humane, enjoyable, and environmentally and socially responsible.

How can historical knowledge contribute to better roadway layouts? One, understanding the ways that roadway patterns were envisioned and instituted in the past increases awareness of similar processes operating in the present. Historical knowledge thus can provide a strategic advantage to reformers. Two, understanding past debates—the arguments for and against different types of traffic separation—helps inform participation in current debates, because many of the issues and arguments are similar. Three, the outcomes of past practices were subpar in many cases, and understanding why helps practitioners avoid similar mistakes in the present. Four, past experiments and visions may inspire the designers of future urban forms and roadway patterns.

Traffic-separation history helps demystify the physical patterns of contemporary

built environments. Those patterns did not spontaneously generate from a baffling fog. They were neither accidental nor predetermined. They were the result of many dedicated people working to realize definite visions through purposeful actions, often strongly influenced by earlier visions. Our present-day built environments were, in many respects, intentional. Traffic-separation history is one key to understanding those intentions, which are embodied in every street and highway of the modern city.