INTRODUCTION

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THE PURPOSE OF THIS PUBLICATION is to foster a better understanding of the planning, design, development, and operation of parking facilities. While we all hope to see a reduced dependence on the automobile as the main means of urban mobility, today, the prospect of a more pedestrian-oriented transit infrastructure is not realistic in many regions of the country.

In many types of development, the overall area of the parking component is equal to or larger than that of the businesses the parking serves. Yet despite its large share of a project's total square footage, parking has been at best a secondary consideration in many prominent developments.

The Dimensions of Parking seeks to provide those who develop parking facilities with information that can improve development of those assets. This publication has been cowritten by professionals from top consulting firms that specialize in parking and share the desire to improve parking conditions.

HISTORY

Since the time when Model T owners stored their cars next to buggies in horse barns, the parking facility has become a fundamental element in the development of urban centers throughout the world. Parking garages began as one-story brick buildings in mostly residential neighborhoods. Hotels in major cities were the first business type to build structured commercial garages, and most first-generation commercial garages were attended "valet garages." Many of the early garages were heated, enclosed buildings with traditional window glazing systems.

It was the hotels, predominantly in the downtowns of cities like Chicago and New York, that revolutionized parking and made garages a significant part of the urban landscape.[1] The Hotel LaSalle in Chicago was among the first hotels in the country to take on the parking challenge. It built a red-brick, multilevel, freestanding garage with glazed windows to keep out the rain and a ramp to ensure speedy parking. The hotel touted it as "America's finest garage."

Although automobiles were invented in the 19th century, they did not become common until 1905, when hundreds of companies churned out "horseless carriages." In cities everywhere, these early automobiles jockeyed for space with carriages, horses, and trolley cars; there simply was not enough street parking available to accommodate them all. There was only one way to go: up.

In the late 1920s, resilient automobile paint finishes set off another major change in parking facility design. Cars could be left outside in the rain or snow overnight without being damaged, an innovation that led to garages without windows. Although the construction of new garages came to a halt with the Great Depression, and later with World War II, new construction rose sharply in the late 1940s with the first self-park garages. The interfloor ramping systems in early self-park garages were straight express ramps, with all vehicles parked on flat floors. In the late 1940s, parking garage designs were reinvented once again with the proliferation of park-on ramp designs.

With the building boom of the 1950s, the self-park, open-air facility became the standard of parking design for many years. Just as service stations evolved into self-serve gas stations, parking garage owners, in an effort to reduce operating costs, moved away from the 100 percent valet model. The self-park garage design was used at commercial for-pay facilities, as well as private parking garages. With the move away from attended facilities dramatically reducing labor costs, many businesses that previously could not afford structured parking developed new parking garages.

EVOLUTION OF PARKING FACILITY DESIGN

The design of parking and particularly parking structures has evolved since those first horseless-carriage barns. Early parking garages were short-span structures. Designs that allowed clear-span structures were extremely expensive and not economically viable because paying for parking was not yet a universally accepted concept. Many early parking facilities earned revenue from the sale of gasoline or on-site repair services. But as parking became a viable business in many of the country's larger cities, garage designs improved.

In addition to valet and self-park garages, several other parking schemes were attempted. Elevator garage operations began in the United States in the 1930s—simple elevator systems that moved cars vertically to pigeon-holed spaces or single-bay parking floors. Mechanical systems designed in the late 1940s used elevator cars that operated on a gantry and allowed the car to move vertically and horizontally. Although there were many elevator garages in America's most dense urban centers, automated parking never became popular in the United States: economics favored conventional self-park designs with lower labor and maintenance costs. Mechanical parking systems fared much better in Europe and Japan, where large real estate parcels are scarce—a scarcity that continues to drive advancement of mechanical designs in those countries today.

The overriding goal imposed on most parking designers has always been "efficient parking." Much attention has been paid to minimizing stall geometry and circulation area in parking facilities to yield highly efficient parking. While optimized efficiency is still important, the trend now is to provide more functional, user-friendly designs.

Today's parking facilities are sophisticated buildings created for specific user groups, with designers focusing on the vastly divergent use patterns of parking patrons. For instance, a garage appropriate for a downtown office building may be inappropriate for a medical office building. Many authors of the fifth edition of *The Dimensions of Parking* focus on the facility patron, not just the automobile. Space width, row orientation, vertical circulation, wayfinding, throughput, and new technologies in the area of parking access and revenue control—all topics that address the user's overall parking experience—are covered in this publication.

WHY *DIMENSIONS OF PARKING*?

There is no type of development that is not touched by the issue of parking. No sports facility, convention center, theater, apartment building, retail center, office building, medical complex, airport, municipal facility, or institution of higher education can be developed without considering some of the issues presented in this publication.

Just as the fundamental business strategies of other property types have evolved, so has much of the subject matter featured in this publication. The sports facility has evolved from a place offering a simple family activity to a retail and corporate entertainment colossus. Retail venues have morphed from regional malls into lifestyle centers. And commuter stations have quickly grown up to become transit-oriented developments.

The fifth edition of *The Dimensions of Parking* strives to cover many aspects of parking and provide the reader with the current best practices in the industry. The authors are more than just architects, engineers, designers, and consultants; they are specialists who are passionate about their field. They take the reader through the processes of planning and design, and then weigh in on the operational considerations of managing safe and secure facilities. And, finally, they discuss the long-term maintenance issues associated with this building type. It is the authors' hope that readers of *The Dimensions of Parking* will gain a greater appreciation for parking facilities.

NOTE

1. Mary Beth Klatt, "Car Culture: Some Cities Convert Historic Parking Garages into Lofts or Lots," *Preservation* online, Oct. 4, 2004. www.preservationnation.org/magazine/story-of-the-week/2005/car-culture.html.