How Far Should Parkers Have to Walk?

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One of the most frequently asked questions in any parking planning process is: How far can we expect people to walk from a parking facility to their ultimate destinations? Yet while most parking consultants will tell you there are generally accepted rules of thumb, no two consultants answer that question in quite the same way.

The primary cause for lack of consensus is that there are different factors that affect different situations. For instance, parking designers usually call for maximum walking distances between 300 and 600 feet for retail customers, but between 1,200 and 1,500 feet for employee parking. Distances increase even more when you look at special event standards: maximum walking distances accepted for theme parks, stadiums and arenas reach as high as 2,000 feet.

One reason we talk in terms of "rules of thumb" is that there are no definitive standards or guidelines for the industry. The most widely quoted reference on pedestrian design in the architectural and transportation press is an older book, *Pedestrian Planning and Design*, by John J. Fruin, PhD, upon which we have relied heavily for this article.

In his book, Fruin asserts that "there are indications that the tolerable limit of human walking distance is more situation-related than energy-related." The tolerable walking distance for "a given design situation is related to such factors as the trip purpose of the individual, the available time and the walking environment," Fruin writes.

We would expand Fruin's list of variables affecting acceptable walking distance to include the types of users, frequency of occurrence or use, the familiarity of the user with the facility, the perception of security, the expectations and concerns of the user, the degree of weather protection provided along the path of travel, the perception or absence of barriers or conflicts along the past of travel, and the cost of alternatives to walking, if any.

Another reason we can rely only on rules of thumb is because until recently, parking facilities were considered to be little more than a necessary evil to any land-use development. As a result, many elements of functional design have been addressed with these rules of thumb, which are applied across the board to every type of parking project.

In recent years, however, property owners and developers have come to recognize that parking is the first and last impression afforded to both visitors and employees. As such, they are becoming increasingly determined to make the parking facility reflect and be compatible with the image of the complex as a whole.

Because each owner has a different vision or mission for the property, the appropriate walking distance and other design parameters will not be the same even for complexes with the same land uses. For example, the neighborhood shopping center will have different parking convenience needs than either a high fashion center or regional mall.

With this change in philosophy, rules of thumb no longer provide adequate guides for parking design.

The LOS Approach

To evaluate the qualitative variables in parking design in a systematic and logical way, Walker Parking Consultants/ Engineers has developed the level of service (LOS) approach to parking design. Borrowed from the traffic engineering profession, it allows us to consider a variety of variables affecting acceptability of such design decisions as parking stall and aisle widths, turning radii, entry and exit queuing standards, and sloping of parking floors and express ramps.

The level of service classification system is similar to the grading system used in schools: LOS A is the best or ideal performance; LOS B is good; C is average; and D is below average but minimally acceptable. LOS E is the approximate point of failure, and LOS F describes gridlock conditions.

The LOS system is used to reflect the acceptability by the users of a community of certain parameters. Most roadways that are new or are being improved are designed to attain a LOS of C or better. LOS D is tolerated by commuters in our major urban centers like New York, Los Angeles and Chicago; and efforts to mitigate the conditions would not be initiated until the LOS drops to E or even F. In a small town, a street condition of LOS B may generate an outcry for traffic improvements.

Similarly, issues related specifically to the parking patron can be reflected by the level of service approach. In many cases the specific type of user plays a major role, even within the same land use type. Is the typical user a family going to a theme park (perhaps loaded down with strollers and diaper bags) or a group of adult friends going to a football game? Is it an elderly couple meeting the family at the airport or a business traveler? Are there transportation alternatives for the user? Is the user a shopper who has a number of location choices or a visitor who comes to the site for a specific reason that will not be heavily influenced by parking convenience, such as a visit to a specific doctor? How long is the person going to stay – a few minutes or all day? Are there a variety of parking options at various prices and walking distances such as in a central business district? How often does the user park in the same facility: every day or once a year? Is it a stressful situation, such as hurrying to the airport or going to the hospital, or a more routine commute or shopping trip?

The individual parker's expectations are also important. Is the location suburban or urban? Is the lot an overflow location at the regional shopping center used only at Christmas season or a lot in front of a strip/convenience center? Is it a special event where congestion and long walking distances, are anticipated or a suburban office park where convenience is part of the marketing of the building to tenants? Is it a corporate headquarters where the image of the corporation is an issues or a speculative office building.

Security also is an element perceived by the user; will he/she be hurrying to traverse the area as quickly as possible, or will the person feel comfortable enough to walk a fairly long distance? Major factors that affect the perception of security include time of day, the neighborhood, the general activity levels and lighting.

With all these different variables, it is easy to see why it has been difficult to set precise standards. We do feel, however, that it is possible to develop such standards.

In each of the above questions and situations, a somewhat better level of service is needed to satisfy the former than the latter types of user. We also might design to different levels of service at different points within the system. For example, we consider that the parking used on average or typical days at shopping centers should be designed for LOS A; for busy Saturdays LOS B should be maintained; and the parking that only gets used for a few hours on the busiest days of the year might be designed for LOS C. We usually design airport parking for LOS A, although, occasionally, we drop to B for long-term, frequent flyer parking.

Other Issues

Other issues affecting walking distance are related to the path of travel itself. Based on our experience and available literature, we have determined there are at least four variables related to path of travel: degree of weather protection, climate, line of sight (can the parker see the destination from the parking space?) and "friction" (interruptions and constraints on the path of travel such as crossing streets with or without traffic signals, and natural and psychological barriers such as railroad tracks or a change in neighborhood).

To fully reflect all path-of-travel variables in a classification of walking distance by level of service would require an overly complex matrix. After some study, however, we found that the degree of weather protection is the most critical variable. We further decided that acceptable walking distances entirely within a parking facility are shorter than those for urban sidewalks, pedestrian bridges or inside buildings such as airports. Because the user of a facility walks down a parking aisle or follows a path between cars to reach the elevator, a high degree of "friction" exists for this system. Also, since parking structures are generally perceived as being less safe than open surface lots, the distinctions between walking within parking lots and structures should be recognized.

Therefore, we have determined the level of service of walking distances for five different types of circumstances. The first three reflect degrees of protection along a dedicated path of travel (i.e., not within a parking facility):

1. **totally unprotected**
2. **covered to reduce the effects of rain or snow**
3. **climate controlled such as in a pedestrian bridge**

The final two categories are:

4. **walking within a surface parking lot**
5. **walking within a parking structure or garage**

The table below presents our recommended gradation of maximum acceptable walking distance for levels of service A through D, which is the lowest level that would be used under design circumstances. We have not tried to determine a distinction between E (the point of failure) and F (gridlock).

Level of Service Conditions	A	B	C	D
Climate Controlled	1,000 ft.	2,400 ft.	3,800 ft.	5,200 ft.
Outdoor/Covered	500	1,000	1,500	2,000
Outdoor/Uncovered	400	800	1,200	1,600
Through Surface Lot	350	700	1,050	1,400
Inside Parking Facility	300	600	900	1,200

Experience has shown that climate in the locality is not a primary factor. There are few, if any, places in the United States that have a truly ideal walking climate year round. Heat can be just as discouraging to walking as cold – rain just as discouraging as snow. Certainly a perfect day increases the acceptable walking distances and would probably increase to the maximum walking distances in climate controlled settings. In the few localities where perfect weather is the year-round norm, we recommend that the climate controlled figures on the table be used.

The maximum walking distance for an unprotected path of travel in a non-parking environment was determined first, using several different types of information.

Fruin's Data

The most important determinant was Fruin's data on the relationship between the walking distance and the proportion of people who choose to walk versus those who choose other modes of travel. This data came from an origin/destination survey at the Port Authority Bush Terminal in midtown-Manhattan. This mid-town terminal situation is probably as close to ideal for studying the point at which an unprotected walking distance goes from being minimally acceptable to unacceptable. With a walking distance of less than 1,000 feet, virtually everyone chose to walk, rather than catch a bus, take a taxi or other available alternatives.

A common criteria for design in the transportation and parking industry is the 85th percentile, i.e., one selects a parameter that is acceptable to 85 percent of the population. Designing for the 100th percentile is excessively expensive; designing for the mean results in problems for 50 percent of the population. In the midtown bus terminal study, at a distance of about 2,500 feet, 85 percent chose to walk. If the walk was a mile, about half the people chose to walk. Fruin was careful to note that the data was collected on a "fair spring day, resulting in longer walking distances than would otherwise have occurred in New York City."

Fruin compared the above distances to the "severely criticized" maximum walking distances from curbside to gates at such airports as O'Hare (1735 feet), Atlanta (1730 feet), Dallas/Fort Worth (DFW) (1,650 feet) and San Francisco (1,300 feet). Los Angeles, Kennedy, Miami and Detroit each had maximum distances of about 1,100 feet.

The airport walking paths would be primarily in protected, climate controlled spaces. However, people may be hurrying to catch a plan; tired after a long business day; or toting children, strollers and carry-on luggage. Also, the total walking distances from parking space to gate would be substantially longer.

Fruin noted that inter-terminal distances at those airports range from 2,000 to more than 8,000 feet. Some of the inter-terminal pedestrian connections are indoors, while others are unprotected. Most people use the inter-terminal bus service at the longer distances. (It is interesting to note that since publication of Fruin's book, moving sidewalks have been added to O'Hare, both in the terminal and between elevator cores in the garages; and a peoplemover has been added to the pedestrian terminal at the American concourse at DFW.)

For special events, several references have cited 1,500 to 2,000 feet as a reasonable walking distance.

For university campuses (usually a LOS C or D condition), our extensive experience with parking studies has found that a significant number of students will walk as far as a mile in good weather, rather than wait for the university shuttle bus. However, the usage of the shuttle system increases sharply in poor weather. The students will not park in distant lots (more than 1,500 to 2,000 feet) at all if shuttle service is not available to provide protection on poor weather days.

City Walking

In cities such as Chicago, anecdotal analysis of commuter walking distances indicates that 1,600 feet is a realistic maximum for LOS D for typical weather conditions.

The LOS A unprotected walking distances in our chart also were derived from sources that cited similar figures.

Several cited an ideal walking distance inside the ring road at major shopping centers as 400 feet; this distance also has been found to be a reasonable walking distance for shoppers in central business districts. One source cited 350 feet as the ideal walking distance for hospital parking.

Therefore, the acceptable maximum unprotected walking distances have been scaled from LOS A of 400 feet to LOS D of 1,600 feet. The protected walking distances were scaled from 500 feet for LOS A to 2,000 feet for LOS D, an increase of 25 percent over the unprotected distances. The fair weather bus terminal study, our experiences with university student parking and the airport data cited by Fruin led us to scale the climate controlled walking distances from 1,000 feet for LOS A to 5,200 feet (just under a mile) for LOS D. We understand that it is considered "ideal" (i.e., LOS A) in the airport industry to provide a moving sidewalk or other people-mover if the walking distance inside the terminal, and thus under climate controlled circumstances, exceeds 1,000 feet.

Where there is friction along the pedestrian path of travel, such as streets to cross and traffic signals, the acceptable walking distance may be reduced by 25 percent or more.

For surface lot walking distances, we have relied on a number of experiences and anecdotes in the design of parking for shopping centers and other uses such as theme parks. We then further discounted the walking distances within parking structures. It should be noted that the acceptable walking distances we have given are substantially longer than those published by one of the authors because of additional experience gains with mega-structures (more than 3,000 parking spaces) since the book *Parking Structures* was published in 1989.

A path of travel often includes components from several of the above categories and conditions. In these cases acceptable total path is less than the total path in climate controlled circumstances for a LOS one notch below the LOS used for the individual components. For example, an airport to be designed for LOS A would want to have a maximum path of travel of 300 feet from the parking space to the elevator within a parking facility, and a weather-protected path of no more than 500 feet from the elevator lobby to the terminal. There may then be a climate controlled path of no more than 1,000 feet from the entrance to the terminal to the gate. The overall path of travel should not exceed 2,400 feet (LOS B).

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