

1.0 BACKGROUND

In 1979, the City undertook a comprehensive review of parking and loading standards for non-residential land uses and related issues, including parking module dimensions, handicapped parking, etc. The recommendations of the study titled “*Commercial and Industrial Parking Study*” were adopted by City Council on November 26, 1979. The recommendations included, among others matters, amending or adding the definition of “PARKING SPACE”, adding the definition of “AISLE”, and adding the provisions regarding handicapped parking space.

In the mid-1980's, in response to the trend of downsizing of automobiles, a study was undertaken by the Planning and Building Department to assess the dimensions of parking modules. On April 13, 1987, City Council adopted Resolution 139-87, which recommended, among other matters, that the definitions of “PARKING SPACE” and “AISLE” be amended. By-laws 442-87, 443-87 and 444-87, enacted by City Council on June 8, 1987, reduced the required minimum width and length of a parking space, but increased the required minimum width of an aisle.

At the June 2, 1997 meeting of the Planning and Development Committee, to consider the report titled “*Parking Standards Process Review Study*” dated May 13, 1997, concerns were raised regarding the size of parking spaces. The Planning and Development Committee approved the following Recommendation PDC-79-97, which was adopted by City Council on June 11, 1997:

- “1. That the report entitled “*Parking Standards Process Review Study*” dated May 13, 1997 referred to the June 16, 1997 meeting of the Planning and Development Committee be received.
2. That the Planning Department staff be directed to add to their work plan, a review of the size of parking stalls presently being permitted under current City By-laws.”

In accordance with Recommendation PDC-79-97, this study reviews the size of a parking space, the width of an aisle, angled parking provisions, parking provisions for the disabled, and related parking issues.

2.0 ZONING BY-LAWS PROVISIONS

Prior to the enactment of Zoning By-laws 126-80, 186-81, 228-81, and 230-81 in 1980/1981 to amend the three Mississauga Zoning By-laws (Zoning By-law 5500, Zoning By-law 1227 and Zoning By-law 65-30), there was a definition of “PARKING SPACE” in Zoning By-law 5500 (former Town of Mississauga) and in Zoning By-law 65-30 (former Town of Streetsville), but not in Zoning By-law 1227 (former Town of Port Credit). In all three Zoning By-laws, there was no definition of “AISLE”.

In Zoning By-law 5500, “PARKING SPACE” was defined as follows:

“PARKING SPACE” means an area of not less than 18.5 m² [200 sq. ft.], exclusive of driveways or aisles, for the temporary parking or storage of motor vehicles.

In Zoning By-law 65-30, “PARKING SPACE” was defined as follows:

“PARKING SPACE” means an area of not less than 3.05 m [10 ft.] by 6.1 m [20 ft.] exclusive of driveways or aisles, for the temporary parking or storage of motor vehicles.

The three Zoning By-laws were amended in 1981 in accordance with the recommendations of the study titled “*Commercial and Industrial Parking Study*”. The definitions of “PARKING SPACE” and “AISLE” were as follows:

“PARKING SPACE” means a rectangular area for the temporary parking or storage of a motor vehicle on the same lot with a building, or contiguous to a group of buildings and having a minimum width of at least 2.75 m [9.0 ft.] and a minimum length of at least 6 m [19.7 ft.], exclusive of aisles and driveways.

“AISLE” means an internal roadway immediately adjacent to each parking and loading space to provide vehicular ingress and egress at all times and having a width of at least 6 m [19.7 ft.].

Provisions for handicapped parking spaces for non-residential developments were also added to the three Zoning By-laws. The Zoning By-laws state that “*1% of the parking spaces required...(minimum of one and a maximum of 35 parking spaces), shall be reserved for the use of the physically handicapped; and shall be appropriately signed as being for physically handicapped persons; and shall be distributed among all entrances; and shall have a minimum width of 4.6 m [15.1 ft.]*.”

On June 8, 1987, City Council enacted By-laws 442-87, 443-87 and 444-87 which amended the three Zoning By-laws by reducing the required minimum width and length of a parking space, but increasing the required minimum width of an aisle. “PARKING SPACE” and “AISLE” are now defined as follows:

“PARKING SPACE” means a rectangular area for the temporary parking or storage of a motor vehicle on the same lot with a building, or contiguous to a group of buildings and having a minimum width of at least 2.6 m [8.5 ft.] and a minimum length of at least 5.2 m [17.1 ft.], exclusive of aisles and driveways.

“AISLE” means an internal roadway immediately adjacent to each parking and loading space to provide vehicular ingress and egress at all times and having a width of at least 7 m [23.0 ft.].

3.0. PARKING SPACE AND AISLE REVIEW

3.1 Parking Module

There are three components in a parking module: the width of a parking space, the length of a parking space and the width of the abutting aisle.

With respect to the width of a parking space, consideration needs to be given to the vehicle width and side door clearances which vary depending on the design of the vehicle, including door swing, the level of convenience, and the parking angle. The length of a parking space is determined by the vehicle length plus the bumper-to-bumper clearance. From an operational standpoint, the length of a parking space is dependent on the width of the abutting aisle. The aisle width is determined by the manoeuvring space required to park in one continuous movement. The aisle width is a function of the vehicle turning radii, parking angle and the width of a parking space.

3.2 Vehicle Dimensions

The Canadian Automobile Association (CAA) publishes annually the profiles of selected vehicles. In the 1998 CAA Autopinion Guide, a total of 185 models were featured, the vehicle dimensions of which are summarized in Appendix A. Vehicle types are broken down into four categories: cars, vans, sport utility vehicles, and trucks.

(a) Cars

Of the 130 models of cars listed, none exceeded the minimum width standard of 2.6 m (8.5 ft.). A total of seven cars equalled the minimum length standard of 5.2 m (17.1 ft.). These were the Bentley Continental T, the Buick Park Avenue, the Buick Riviera, the Lincoln Continental, the Lincoln Mark VIII, the Mercedes-Benz S-Class and the Oldsmobile Aurora. Another seven cars exceeded the minimum length standard of 5.2 m (17.1 ft.). These were the Bentley Azure/Continental R, the Bentley Brooklands R/Turbo RT, the Cadillac DeVille, the Ford Crown Victoria, the Lincoln Town Car, the Mercury Grand Marquis and the Rolls-Royce Silver Spur.

(b) Vans

Of the 16 vans listed, none exceeded the minimum width standard of 2.6 m (8.5 ft.). Two vans exceeded the minimum length standard of 5.2 m (17.1 ft.). These were the Chevrolet Van/Express/GMC Savanna and the Ford Econoline/Club Wagon.

(c) Sport Utility Vehicles

Of the 28 sport utility vehicles listed, none exceeded the minimum width standard of 2.6 m (8.5 ft.). Two sport utility vehicles equalled the minimum length standard of 5.2 m (17.1 ft.). These were the Ford Expedition and the Lincoln Navigator. One sport utility vehicle, the Chevrolet/GMC Suburban exceeded the minimum length standard of 5.2 m (17.1 ft.).

(d) Trucks

Of the 11 trucks listed, none exceeded the minimum width standard of 2.6 m (8.5 ft.). Four trucks exceeded the minimum length standard of 5.2 m (17.1 ft.). These were the Chevrolet C/K Pickup/GMC Sierra, the Dodge Dakota, the Dodge Ram and the Ford F-Series.

In summary, of the 185 models of vehicles listed in 1998 CAA Autopinion Guide, none exceeded the minimum width standard of 2.6 m (8.5 ft.). Nine vehicles equalled the minimum length standard of 5.2 m (17.1 ft.), while 14 vehicles exceeded this standard. It should be noted, however, that many of the vehicles that equalled or exceeded the minimum length standard are luxury automobiles and make up a small percentage of the total automobile fleet. As previously mentioned, from an operational perspective, the length of a parking space is less critical than its width, and can be compensated by a wider aisle, which in Mississauga is a minimum of 7.0 m (23.0 ft.) wide.

3.3 Changes in Vehicle Dimensions

The main reason the parking module dimensions were reduced in 1987 was in response to a trend to smaller vehicles, probably resulting from the energy crisis of the late 1970's and early 1980's. However, since the late 1980's, this trend appears to have reversed.

In order to determine the magnitude of this trend toward longer and wider vehicles over the past 12 years, a database from Transport Canada known as the "Canadian Vehicle Specification System (CVS) Version 1998.1" was obtained. The CVS database lists a wide variety of vehicle specifications for every type of vehicle on the Canadian market since the year 1971. For the purposes of this report, Appendix B summarizes the average dimensions for all models in the CVS database from 1985 to 1998.

The average vehicle width and length, of all models by year, have increased gradually since 1987, as shown on Appendix B. The average vehicle width has increased from 1.75 m (5.74 ft.) in 1987 to 1.85 m (6.07 ft.) in 1998, a difference of 10 cm (4 in.), while the average vehicle length has increased from 4.61 m (15.12 ft.) in 1987 to 4.95 m (16.24 ft.) in 1998, a difference of 34 cm (13.4 in.).

For example, in 1987, 59 models of vehicles (11.0% of the total 1987 models) exceeded the width of 2.0 m (6.6 ft.), with the widest measuring 2.03 m (6.66 ft.). By 1998, the number of models exceeding 2.0 m (6.6 ft.) has increased to 97 (16.2% of the total 1998 models), the widest measuring 2.40 m (7.87 ft.), but still below the minimum By-law width standard of 2.6 m (8.5 ft.) for a parking space. In 1987, 53 models (9.8% of the total 1987 models) exceeded the minimum length of 5.2 m (17.1 ft.), with the longest measuring 5.81 m (19.06 ft.). By 1998, there were 185 models (30.8% of the total 1998 models) exceeded the minimum length of 5.2 m (17.1 ft.), and the longest measured 6.35 m (20.83 ft.).

The CVS database was also used to determine whether or not popular models of vehicles substantially increased in length and/or width over time. Specific cars looked at included the Acura Integra, Chevrolet Camaro, Chevrolet Cavalier, Ford Mustang, Ford Taurus, Honda Civic, Mazda 626, Nissan Sentra and Toyota Camry. In the sport utility vehicle category, the Chevrolet Blazer, Ford Bronco, Jeep Cherokee, Nissan Pathfinder and Toyota 4Runner were referenced. For vans and trucks, the Chevrolet Astro, Dodge Caravan, Dodge Dakota and Ford F-150 were looked at. Generally, most of these vehicles have become bigger over the past ten years, but none have substantial increases in the length and/or width. The likely reason why average vehicle widths and lengths have increased gradually over time and why there are a greater number of longer and/or wider

vehicles on the road is due to the greater variety of models, particularly in the minivan, sport utility vehicle, truck and full-size luxury car categories, built by automobile manufacturers.

3.4 Comparison of Parking Space and Aisle Standards with Other Municipalities

Appendix C is a summary of minimum parking space width and length, as well as minimum aisle width of other municipalities within the GTA. Responses were received from 12 municipalities/districts (Brampton, Burlington, Hamilton, Markham, Oakville, Oshawa, Richmond Hill, Toronto [Etobicoke, East York, North York and Scarborough], and Vaughan).

The minimum parking space width dimension in 10 of the 12 municipalities/districts falls within the range of 2.7 m (8.9 ft.) and 2.75 m (9.0 ft.). The anomalies are Toronto - East York with a minimum parking space width of 2.4 m (7.8 ft.), and Oshawa with a minimum parking space width of 2.6 m (8.5 ft.). The current minimum parking space width in Mississauga is 2.6 m (8.5 ft.), which is the same as in Oshawa, but less than 10 other municipalities/districts surveyed.

The minimum parking space length requirement of the 12 municipalities/districts surveyed ranges from 5.4 m (17.7 ft.) to 6.0 m (19.7 ft.), all exceeding Mississauga's minimum parking stall length requirement of 5.2 m (17.1 ft.). It should be noted, however, that the minimum aisle width of 7.0 m (23.0 ft.) required in Mississauga exceeds 11 of the 12 municipalities/districts surveyed. Wider aisle width can compensate for shorter parking space length requirement by facilitating a vehicle's ability to manoeuvre into a parking space.

3.5 Side Door Clearance Space

Although the minimum width of a parking space of 2.6 m (8.5 ft.) is able to accommodate all the 185 models listed in the 1998 CAA Autopinion Guide, additional space is required to manoeuvre a side door. To determine whether or not a 2.6 m (8.5 ft.) parking space width is sufficient, vehicle widths were further reviewed to determine if vehicles parked side by side have adequate side door clearance space.

Based on a sample measurement of a few models of vehicles, the width of the driver's door varies from 1.0 m (3.3 ft. or 40 in.) to 1.3 m (4.3 ft. or 51 in.). Generally, a side door clearance space of 0.75 m (2.5 ft. or 30 in.) is considered adequate for drivers/passengers to manoeuvre in and out of the vehicles without difficulty.

In an ideal situation, assuming that vehicles are parked in the centre of the parking space with a current standard of 2.6 m (8.5 ft.) by 5.2 m (17.1 ft.), and assuming that each vehicle requires a minimum of 0.75 m (2.5 ft. or 30 in.) of side door clearance on each side, with half of the side door unobstructed clearance space, ie. 0.375 m (1.25 ft. or 15 in.), to be over the abutting parking spaces, a vehicle would have to be 1.85 m (6.1 ft.) or less in width to accommodate these clearances on both sides.

Of the 185 models of vehicles listed in Appendix A, 62 models (34% of the total surveyed 1998 models or 1 in 3 surveyed models) exceeded a width of 1.85 m (6.1 ft.). This implies that, in theory, 1 in 3 parked vehicles could be in a tight parking space when the side doors are open for drivers/passengers to get in and out of the vehicle. If the minimum width of a parking space standard is increased to 2.75 m (9.0 ft.), a vehicle would have to be 2.0 m (6.6 ft.) or less to accommodate these clearances on each side. In this case, the number of models exceeded a width of 2.0 m (6.6 ft.) decreases from 62 to 15 (8% of the total surveyed 1998 models). Of these 15 models, seven were luxury cars (ie. Bentley Azure, Bentley Brooklands, Bentley Continental, Jaguar Vander Plas, Jaguar XJ8, Jaguar XJR, Lamborghini Diablo), three were vans (ie. Chevrolet Van/Express/GMC Savanna, Dodge Ram Van, Ford Econoline), three were sport utility vehicles (ie. Ford Expedition, Hummer, Lincoln Navigator), and two were trucks (ie. Dodge Ram, Ford F-Series).

3.6 Proposed Revised Definition of “PARKING SPACE”

In view of the trend of increased vehicle widths over the past 12 years and the increasing proportion of wider vehicles in the total fleet, it is recommended that the minimum width of a parking space as defined in the Zoning By-laws be increased from 2.6 m (8.5 ft.) to 2.75 m (9.0 ft.). The suggested minimum parking space width of 2.75 m (9.0 ft.) would be at the high end of the range compared to other municipalities (three of the 12 municipalities/districts surveyed define the minimum width of a parking space to be 2.75 m [9.0 ft.]).

The average length of a vehicle has also been increasing. However, the required minimum aisle width of 7.0 m (23.0 ft.) in Mississauga, which exceeds the minimum aisle width required by other municipalities/districts within the Greater Toronto Area (GTA) except the City of Toronto - Etobicoke, would compensate for the slight shortfall. Therefore, it is suggested that the minimum length of a parking space of 5.2 m (17.1 ft.) as defined in the Zoning By-laws remain unchanged.

To increase the minimum width of a parking space from 2.6 m (8.5 ft.) to 2.75 m (9.0 ft.), it is necessary to change the definition of “PARKING SPACE” in the Zoning By-laws. The definition will also be amended to ensure that the rectangular area is unobstructed of columns, pillars, etc. The suggested definition of a “PARKING SPACE” is as follows:

“PARKING SPACE” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a minimum width of 2.75 m (9.0 ft.) and a minimum length of 5.2 m (17.0 ft.), exclusive of any aisle or driveway.

The proposed amendment to the definition of “PARKING SPACE” also requires an amendment to the general provisions section under Parking and Loading Standards for Non-Residential Land Uses by requiring parking spaces to be provided and maintained on the same lot with a building or contiguous to a group of buildings.

For consistency, relevant general provisions sections of the Zoning By-laws that have the definition of “PARKING SPACE” should be amended or deleted, as appropriate.

The effect of the proposed increase in the minimum width of a parking space on development is illustrated on Sketches 1 and 2.

Sketch 1 shows a 0.4 ha (1 acre) parking lot with 2.6 m (8.5 ft.) by 5.2 m (17.1 ft.) parking spaces and 7.0 m (23.0 ft.) wide aisles as currently defined in the Zoning By-laws, and the required minimum landscaped area. The total number of parking spaces provided would be 130 spaces.

Sketch 2 shows an identical 0.4 (1 acre) parking lot, but with 2.75 m (9.0 ft.) by 5.2 m (17.1 ft.) parking spaces and 7.0 m (23.0 ft.) wide aisles, and the required minimum landscaped area. The total number of parking spaces provided would be 123 spaces, a 6% reduction in the total number of parking spaces provided under the current Zoning By-laws provisions.

3.7 Definition of “AISLE”

The width of an aisle, defined at 7.0 m (23.0 ft.) in the Zoning By-laws, will be maintained for two-way traffic. However, to add angled parking provisions to the Zoning By-laws for one-way traffic, to be discussed in Section 4.0 of this report, the definition of “AISLE” needs to be amended. Changes to the definition of “AISLE” will be discussed in Section 4.6 of this report.

3.8 Legal Non-Conforming Parking Spaces

Numerous industrial/commercial and multiple residential projects have been built under the zoning standards current at the time of issuance of building permits. Any changes to the Zoning By-laws to increase minimum parking space size and/or aisle width would have the effect of making these parking spaces in the existing developments legal non-conforming. For example, many of the older malls in Mississauga have parking lots with parking spaces at the old standard (prior to 1987) of 2.75 m (9.0 ft.) by 6 m (19.7 ft.) with a 6.0 m (19.7 ft.) wide aisle. Owners of these developments can either re-strip the parking spaces and aisles with post-1987 standards of 2.6 m (8.5 ft.) by 5.2 m (17.1 ft.) parking spaces and 7.0 m (23.0 ft.) wide aisle if the total number of parking spaces can be increased, or the parking spaces and aisle width remain under the pre-1987 standard. If a mall had an addition after 1987, the additional gross floor area would require parking at the current parking space standard of 2.6 m (8.5 ft.) by 5.2 m (17.1 ft.) with a 7.0 m (23.0 ft.) aisle width. If the size of a parking space were to increase to 2.75 m (9.0 ft.) by 5.2 ft. (17.1 ft.) as proposed in this report, the parking spaces provided at the current standard would become legal non-conforming. Again, the parking lots could be re-stripped to the proposed standard, or remain as is. Should further expansion occur after the adoption of a revised definition of “PARKING SPACE” as proposed in this report, the new parking area provided would be subject to the new standard. In this situation, the development could possibly have three different parking space and aisle width standards.

3.9 Committee of Adjustment Variances

Committee of Adjustment applications were reviewed with respect to variances to the parking space dimensions and/or aisle width from 1989 to 1998. Table 1 summaries the results of the review.

Table 1: Number of Variances in Parking Space Dimensions and/or Aisle Width, 1989 - 1998

Year	Variance in Parking Space Length & Width	Variance in Parking Space Length	Variance in Parking Space Length & Aisle Width	Variance in Aisle Width	Variance in Shared Aisle Width or Off-Site Aisle
1989	-	-	-	5	10
1990	-	-	-	5	8
1991	-	-	1	1	1
1992	-	-	-	1	4
1993	-	-	-	3	3
1994	-	-	-	2	5
1995	-	-	-	2	-
1996	-	-	-	2	6
1997	-	-	-	5	9
1998	1	4	-	2	14

As shown on Table 1, most of the Committee of Adjustment applications within the 10-year period were for variances to the minimum width of the aisles, shared aisles and off-site aisles. Only one application was approved that reduced both the length and width of a parking space, 4 applications that reduced the minimum length of a parking space, and one application that reduced the minimum length of one parking space and the aisle width. Table 1 illustrates that the number of Committee of Adjustment applications for variances in parking space length and/or width is minimal.

3.10 Payment-in-Lieu of Off-Street Parking Program (PIL)

The proposed increase in the minimum width of a parking space would require changes to the Corporate Policy and Procedure and the Fee By-law concerning the Payment-in-Lieu of Off-Street Parking (PIL) Program, as the formulae for the calculation of PIL payment is based on the size of the parking space dimensions as currently defined in the Zoning By-laws. If the definition of “PARKING SPACE” is amended, the revised PIL program will be dealt with under a separate report.

4.0 ANGLED PARKING

4.1 Zoning By-laws Provisions

The Zoning By-laws presently have provisions regarding parking spaces that are 90° (right angle) to the abutting aisle and parallel parking spaces, but no provisions with respect to parking spaces with a parking angle between 90° and 0°. Yet in many of the older small non-residential development, such as the commercial development at the southeast corner of Burnhamthorpe Road East and Cawthra Road, and a multiple-occupancy mixed-use industrial development on the west side of Wolfedale Road, south of Burnhamthorpe Road West, angled parking spaces are in place in parts of the parking lots because of site layout and space limitation.

4.2 Requirements of Other Municipalities

Eight municipalities/districts in the GTA contacted have provisions for angled parking spaces in the respective Zoning By-laws. Their provisions are summarized in Appendix D. The minimum aisle width associated with the angle of the parking spaces varies by municipalities, with the narrowest aisle width of 3.2 m (10.5 ft.) for a one-way traffic associated with a parking angle of 21° to 45°, to the widest aisle width of 7.9 m (26.0 ft.) for a two-way traffic associated with 90° (right angle) parking angle.

4.3 Proposed Aisle Width for Angled Parking

Angled parking spaces have been provided in many small developments despite no such provisions in the Zoning By-laws. In view that such provisions are contained in many of the municipalities/districts surveyed, it is proposed that the three Zoning By-laws be amended by adding provisions to reducing the minimum aisle width from 7.0 m (23.0 ft.) to 5.5 m (18.0 ft.) to allow a one-way traffic for parking spaces with a parking angle equal or less than 60°. Angled parking provisions allow more options and flexibility in designing parking layout.

The following general provisions are proposed:

Aisle Width

- (1) *The minimum aisle width shall be 7.0 m (23.0 ft.).*
- (2) *Notwithstanding subsection (1) of this section, the minimum aisle width may be 5.5 m (18.0 ft.) only where a one-way aisle is provided for ingress and egress to and from parking spaces with a parking angle not exceeding 60°.*

A definition of “PARKING ANGLE” should also be added to the Zoning By-laws. The following is proposed:

“PARKING ANGLE” means the angle not exceeding 90° formed by the intersection of the side of a parking space and a line parallel to the adjacent aisle or driveway.

4.4 Effects of Allowing Angled Parking

It should be noted that for large developments, parking lots with angled parking produce fewer parking spaces than identical size parking lots with right angled parking spaces, as illustrated on Sketches 2, 3a, 3b, and 3c. Therefore, there is no advantage for large developments to have angled parking spaces.

However, angled parking spaces are beneficial for small developments with site layout and space limitations. Sketch 4 illustrates a scenario where the number of parking spaces could be increased from 4 to 6 parking spaces with angled parking.

4.5 Parallel Parking

Parallel parking is presently permitted in non-residential development, but not in residential development. The proposed amendments noted in Section 4.3 of this report would apply to all development. Therefore, parallel parking spaces will also be applicable to all residential development.

In the section under Parking and Loading Spaces for Non-Residential Land Use of the three Zoning By-laws, the minimum length of a parallel parking space is measured at 7.25 m (23.8 ft.). This minimum parking space length will be maintained, but since there is no definition of “PARALLEL PARKING SPACE” in the Zoning By-laws, one should be added. The section referred to parallel parking spaces in the Parking and Loading Spaces for Non-Residential Land Use of the three Zoning By-laws should be deleted, as it would be redundant with the following proposed definition of “PARALLEL PARKING SPACE”:

“PARALLEL PARKING SPACE” means a unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a parking angle not exceeding 15°, and having a minimum width of 2.75 m (9.0 ft.) and a minimum length of 7.25 m (23.8 ft.), exclusive of any aisle or driveway.

4.6 Proposed Revised Definition of “AISLE”

As noted in Section 3.7 of this report, the existing definition defines an aisle to be a minimum of 7.0 m (23.0 ft.) wide. This width will be maintained for a two-way traffic. But to allow one-way traffic proposed for parking spaces with a parking angle equal or less than 60°, the aisle width will be reduced. As proposed in Section 4.3 of this report where the width of an aisle is defined, it would be redundant to repeat in the definition. Accordingly, the definition of “AISLE” should be amended as follows:

“AISLE” means an internal roadway adjacent to a parking or loading space which provides vehicular ingress and egress to and from the parking or loading space.

5.0 REVIEW OF PARKING PROVISIONS FOR THE DISABLED

5.1 Zoning By-law Provisions

Through adoption of recommendations of the report titled “*Commercial and Industrial Parking Study*” by City Council in 1979, the three Zoning By-laws were amended in 1981 requiring non-residential development to provide designated parking spaces for the disabled. The Zoning By-laws state that “*1% of the parking spaces required ... (minimum of 1 and a maximum of 35), shall be reserved for the use of physically handicapped; and shall be appropriately signed as being for physically handicapped persons; and shall be distributed among all entrances; and to be a minimum width of 4.6 m [15.1 ft].*”

5.2 Disabled Persons Parking By-law 134-83, As Amended

The City has a Disabled Persons Parking By-law 134-83, as amended, for enforcing parking spaces for the disabled, and prohibits the uses of these spaces by other vehicles. It defined “disabled person” as an individual that meets the requirements of such as set out in the regulations made under the *Highway Traffic Act, R.S.O. 1990, c.H.8, as amended*.

By-law 134-83 also contains provisions requiring the number of designated parking spaces which must be provided, to be calculated in accordance with the following:

<u>No. of Automobile Parking Spaces</u>	<u>No. of Designated Parking Spaces</u>
0 - 9	Nil
10 - 30	1 minimum
31 - 60	2 minimum
61 - 90	3 minimum
for each additional 30 or part thereof	1 minimum to a maximum of 12

It also stipulates the size of the parking space designated for the disabled to be a minimum perpendicular width of not less than 3.66 m (12.0 ft.), and a minimum length of 5.2 m (17.1 ft.).

5.3 Discrepancies of Parking Provisions for the Disabled Between the Zoning By-laws and the Disabled Persons Parking By-law 134-83

There are discrepancies regarding parking provisions for the disabled between the Zoning By-laws and the Disabled Persons Parking By-law 134-83, as amended. These discrepancies are summarized in Table 2.

Table 2: Discrepancies of Parking Provisions for the Disabled

Item	Zoning By-laws	Disabled Persons Parking By-law 134-83
Terminology	Physically handicapped person	Disabled person
Minimum Parking Space Width	4.6 m (15.1 ft.)	3.66 m (12.0 ft.)
Minimum Parking Requirement	1% of the total required parking spaces (minimum 1 space to a maximum of 35 spaces)	0-9 spaces - nil 10-30 spaces - 1 minimum 31-60 spaces - 2 minimum 61-90 spaces - 3 minimum for each additional 30 spaces or part thereof - 1 minimum to 12 maximum

Except for developments providing less than 10 parking spaces or more than 1,100 parking spaces, the Disabled Persons Parking By-law 134-83 requires more parking spaces for the disabled than that required in the Zoning By-laws. As an example, for a development requiring and providing 400 parking spaces, Disabled Persons Parking By-law 134-83 would require 12 parking spaces for the disabled, while the Zoning By-laws require only 4 parking spaces. The provision contained in Disabled Persons Parking By-law 134-83 has not been enforced where the development has provided parking spaces for the disabled in accordance with the Zoning By-law as a requirement of site plan control. Historically, By-law 134-83 has been enforced at properties where site plan control did not apply.

5.4 Highway Traffic Act, R.R.O. 1990, REG. 581 - Disabled Person Parking Permits

In the *Highway Traffic Act*, R.R.O. 1990, REG. 581, “disabled person” is defined to mean an individual who is unable to walk unassisted for more than 200 m (656 ft.) without great difficulty or danger to his or her health or safety.

5.5 Comparison of Parking Provisions for the Disabled with Other Municipalities

Appendix E summarizes the parking requirements for the disabled of other municipalities/districts within the GTA. The parking space size designated for the disabled varies by municipality/district, ranging in width from 3.65 m (12.0 ft.) to 4.1 m (13.45 ft.), and in length from 5.7 m (18.7 ft.) to 6.0 m (19.7 ft.). The disabled parking space width in the Mississauga Zoning By-laws is wider than

that of other municipalities/districts, while the parking space length is shorter than that of other municipalities/districts. However, it should be noted that the shorter parking space length in Mississauga is compensated by a wider aisle, which is a minimum of 7.0 m (23.0 ft.) for a two-way traffic.

In terms of the number of designated parking spaces for the disabled, there is again a wide variation. Five of the nine municipalities/districts contacted do not require parking spaces to be designated for the disabled if the total required parking spaces is less than 10. The percentage of the total required parking spaces to be assigned for the disabled varies from 1% to 10 %, while the existing provisions in the Mississauga Zoning By-laws require a minimum of 1% of the total required parking spaces to be designated for the disabled. Three of the eight municipalities/districts contacted also have special provisions for hospitals and medical buildings/clinics, and require more parking spaces to be designated for the disabled.

5.6 Proposed Revised Parking Provisions for the Disabled

To be consistent with the term “disabled person” in the *Highway Traffic Act*, references to “handicapped person” in the three Zoning By-laws should be amended accordingly.

In view of the fact that the minimum width of a parking space designated for the disabled is wider in Mississauga than that of other municipalities/districts, and notwithstanding the trend towards larger vehicles as noted in Section 3.4 of this report, the existing minimum width of 4.6 m (15.1 ft.) in the Zoning By-laws should remain unchanged. Larger size vehicles are generally used by the disabled to accommodate wheelchairs, crutches, braces or other remedial appliances or devices. The existing parking space dimensions also allow ease of moving around the sides of the vehicle by the disabled.

Staff reviewed site plans of 12 non-residential development, which included small commercial sites to large shopping centres, office and industrial development, and conducted site checks in June and November 1999. Table 3 provided the results of site checks on the 12 sites. With the exception of two medical buildings surveyed, the parking spaces designated for the disabled were under-utilized, ranging from 0% to 42% of the provided parking spaces. For the two medical buildings, the parking spaces designated for the disabled were occupied on one of the two surveyed days. At the time of the surveys, all parking spaces designated for the disabled on 4 of the 12 sites were not occupied on both surveyed days.

Five of the nine municipalities/districts surveyed do not require provisions of parking spaces designated for the disabled if the developments require and provide less than 10 parking spaces. The site checks also confirmed that many of the parking spaces designated for the disabled were under-utilized. In this regard, it is suggested that small non-residential development that requires provisions of less than 10 parking spaces should be exempted from providing parking spaces designated for the disabled.

**Table 3: Parking Spaces Designated for the Disabled on 12 Surveyed Sites
June and November 1999**

Site Location	Total No. of Required Parking Spaces	Parking Spaces Designated for the Disabled			
		No. of Required Parking Spaces	No. of Provided Parking Spaces	No. of Occupied Parking Spaces (June and Nov. Surveys)	Occupied Spaces as a % of Required Parking Spaces and % of Provided Parking Spaces
Erin Mills Town Centre, Erin Mills Parkway	4,025	35	44	15 (June)	42% of required spaces 34% of provided spaces
				12 (Nov.)	34% of required spaces 27% of provided spaces
Rockwood Mall, Dixie Road	1,448	15	24	7 (June)	47% of required spaces 29% of provided spaces
				9 (Nov.)	47% of required spaces 38% of provided spaces
Costco, Ridgeway Drive	587	6	12	5 (June)	83% of required spaces 42% of provided spaces
				5 (Nov.)	83% of required spaces 42% of provided spaces
The Parkway Junction Shopping Centre, Central Parkway West	502	6	9	1 (June)	17% of required spaces 11% of provided spaces
				0 (Nov.)	0% of required spaces 0% of provided spaces
Famous Players Silvercity, Vega Blvd.	718	8	9	2 (June)	25% of required spaces 22% of provided spaces
				0 (Nov.)	0% of required spaces 0% of provided spaces
102 Lakeshore Road West Commercial Development	30	1	1	0 (June)	0% of required spaces 0% of provided spaces
				0 (Nov.)	0% of required spaces 0% of provided spaces
Anderson Medical Centre, King Street West	10	1	1	1 (June)	100% of required spaces 100% of provided spaces
				0 (Nov.)	0% of required spaces 0% of provided spaces
Apple Hills Medical Building, Bloor Street	27	1	1	1 (June)	100% of required spaces 100% of provided spaces
				0 (Nov.)	0% of required spaces 0% of provided spaces
One Robert Speck Parkway Office Building	699	7	7	0 (June)	0% of required spaces 0% of provided spaces
				1 (Nov.)	14% of required spaces 14% of provided spaces
Michelin Tire (Canada) Ltd., Marcove Road - Industrial Building	323	4	4	0 (June)	0% of required spaces 0% of provided spaces
				0 (Nov.)	0% of required spaces 0% of provided spaces
Anixter Inc., Foster Crescent - Industrial Building	178	2	4	0 (June)	0% of required spaces 0% of provided spaces
				0 (Nov.)	0% of required spaces 0% of provided spaces
Ryder Truck Rental Inc., Danville Road - Industrial Building	79	1	2	0 (June)	0% of required spaces 0% of provided spaces
				0 (Nov.)	0% of required spaces 0% of provided spaces

For large non-residential developments, many of the parking spaces designated for the disabled are not being utilized. The requirement of 35 parking spaces to be designated for the disabled in the Zoning By-laws is excessive and should be reduced to 25 parking spaces. This would also reduce the incidence of infraction by people without disabled person parking permits using these parking spaces. However, the provision requiring 1% of the total required parking spaces to be designated for the disabled in the Zoning By-laws will be maintained, but to a maximum of 25 required parking spaces. This proposed revised provision does not restrict developments from providing more parking spaces designated for the disabled than is required by the Zoning By-laws.

The existing provisions in the Zoning By-laws requiring parking spaces designated for the disabled to be distributed among all entrances will be revised such that these parking spaces are to be located in proximity to the main entrances.

The proposed changes to the parking space provisions for the disabled in the Zoning By-laws are summarized as follows:

- (1) add to the general provisions a definition of *“PARKING SPACE - DISABLED”* to mean an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a minimum width of 4.6 m (15.1 ft.) and a minimum length of 5.2 m (17.1 ft.), exclusive of any aisle or driveway, and specifically designated in accordance with *The Corporation of the City of Mississauga’s Disabled Persons Parking By-law*;
- (2) the existing provisions in the section under Parking and Loading Standards for Non-Residential Land Uses be deleted and be replaced with the following:

Parking spaces - disabled shall be provided and maintained on the same lot in proximity to the main entrances to a building or structure in accordance with the minimum standards prescribed in the following table:

<u>Total Number of Required Parking Spaces</u>	<u>Minimum Number of Required Parking Spaces - Disabled</u>
0 - 9	Nil
10 - 100	1
101 - 2 500	1% of the total required parking spaces
2 501 and greater	25

As noted in Section 5.1 above, the existing provision regarding parking spaces designated for the disabled applies only to non-residential development. This provision will remain unchanged. However, as no such requirement applies to residential development, especially higher density development such as apartments and townhouses where there are visitor parking spaces provided on site, this matter should be further reviewed, and be dealt with at a later date.

5.7 Proposed Revisions to the Disabled Persons Parking By-law 134-83, as Amended

It is proposed that the By-law Enforcement Division of the Corporate Services Department amend in Disabled Persons Parking By-law 134-83, as amended, the width of a parking space and the number of required parking spaces to be designated for the disabled concurrently with the proposed amendments to the Zoning By-laws. The effect of such an amendment will be that By-law 134-83 will require less parking spaces designated for the disabled than it currently does for developments requiring a total of 1,100 parking spaces or less. On the other hand, the total number of parking spaces designated for the disabled that can be required will be increased from 12 to 25 parking spaces. The rationale for this amendment is based on the study conducted and forming part of this report.

6.0 CONCLUSION

The existing Zoning By-laws define a “PARKING SPACE” as a rectangular area for the temporary parking or storage of a motor vehicle on the same lot with a building, or contiguous to a group of buildings, and having a minimum width of 2.6 m (8.5 ft.) and a minimum length of 5.2 m (17.1 ft.), exclusive of aisles and driveways. An “AISLE” is defined as an internal roadway immediately adjacent to each parking and loading space to provide vehicular ingress and egress at all times and having a minimum width of 7.0 m (23.0 ft.).

A review of these standards suggests that the minimum width of a “PARKING SPACE” should be increased from 2.6 m (8.5 ft.) to 2.75 m (9.0 ft.). The main reason for this recommendation is the trend towards wider vehicles evident from 1987 to 1998. The average width of vehicle models has increased in this period from 1.75 m (5.74 ft.) to 1.85 m (6.07 ft.). Also, there is an increasing proportion of wider vehicles from the total models of vehicles. A minimum parking space width of 2.75 m (9.0 ft.) would also be more in line with the requirements of other municipalities/districts in the GTA. Besides increasing the width of a parking space, the definition will also be amended to ensure that the rectangular area is unobstructed by columns, pillars, etc.

While the average length of vehicles has also increased over the surveyed period from 1987 to 1998, it is suggested that the existing provision - a minimum length of 5.2 m (17.1 ft.) - in the Zoning By-laws be remained unchanged, as the minimum width of the abutting aisle at 7.0 m (23 ft.) for a two-way traffic, which is wider than the requirements of most municipalities/districts except Toronto - Etobicoke, is sufficient to accommodate increases in vehicle length.

The minimum aisle width is proposed to be reduced from 7.0 m (23.0 ft.) to 5.5 m (18.0 ft.) to allow for one-way traffic for parking spaces with a parking angle equal or less than 60°. Definitions of “PARKING ANGLE” and “PARALLEL PARKING SPACE” are proposed. The definition of “AISLE” in the Zoning By-laws also needs to be amended to delete the reference to the width.

A review of the provisions regarding parking spaces designated for the disabled also resulted in recommending various amendments. A definition of “PARKING SPACE - DISABLED” is proposed. The required minimum of 1% of the total parking spaces to be designated for the disabled will be maintained, but the existing provisions will be amended to exempt small non-residential

developments that require a total of less than 10 parking spaces, as well as to reduce the total number of required parking spaces to be designated for the disabled to 25 spaces maximum. Disabled Persons Parking By-law 134-83, as amended, will also be amended concurrently with the proposed amendments to the Zoning By-laws.

7.0 RECOMMENDATIONS

1. That Zoning By-law 5500 (former Town of Mississauga) be amended as follows:

a. That subsections 2(24) and (46) be deleted and the following be substituted therefor:

(24) *“PARKING SPACE” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a minimum width of 2.75 m (9.0 ft.) and a minimum length of 5.2 m (17.1 ft.), exclusive of any aisle or driveway.*

(46) *“AISLE” means an internal roadway adjacent to a parking and loading space which provides vehicular ingress and egress to and from the parking or loading space.*

b. That section 2 be amended by adding the following definitions:

“PARKING ANGLE” means the angle not exceeding 90° formed by the intersection of the side of a parking space and a line parallel to the adjacent aisle or driveway.

“PARALLEL PARKING SPACE” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a parking angle not exceeding 15°, and having a minimum width of 2.75 m (9.0 ft.) and a minimum length of 7.25 m (23.8 ft.), exclusive of any aisle or driveway.

“PARKING SPACE - DISABLED” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a minimum width of 4.6 m (15.1 ft.) and a minimum length of 5.2 m (17.1 ft.), exclusive of any aisle or driveway, and specifically designated in accordance with The Corporation of the City of Mississauga’s Disabled Persons Parking By-law.

c. That subsection 22C(2) be deleted and the following be substituted therefor:

(2) *Where land is used for a purpose set forth in Column 1 and/or Column 2 in Schedule “A” of this section, parking and loading spaces shall be provided and maintained on the same lot in accordance with the minimum standards prescribed in Column 3 for each such use.*

d. That subsection 22C(3) be deleted and the following be substituted therefor:

(3) *Parking spaces - disabled shall be provided and maintained on the same lot in proximity to the main entrances to a building or structure in accordance with the minimum standards prescribed in the following table:*

<u>Total Number of Required Parking Spaces</u>	<u>Minimum Number of Required Parking Spaces - Disabled</u>
0 - 9	Nil
10 - 100	1
101 - 2 500	1% of the total required parking spaces
2 501 and greater	25

e. That subsection 22C(6) be deleted.

f. That By-law 5500 be amended by adding the following section:

Aisle Width.

(1) *The minimum aisle width shall be 7.0 m (23.0 ft.).*

(2) *Notwithstanding subsection (1) of this section, the minimum aisle width may be 5.5 m (18.0 ft.) only where a one-way aisle is provided for ingress and egress to and from parking spaces with a parking angle not exceeding 60°.*

g. That clause 44(17)(c) be deleted.

2. That Zoning By-law 65-30 (former Town of Streetsville) be amended as follows:

a. That subsections 2(45) and (79) be deleted and the following be substituted therefor:

(45) *“PARKING SPACE” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a minimum width of 2.75 m (9.0 ft.) and a minimum length of 5.2 m (17.1 ft.), exclusive of any aisle or driveway.*

(79) *“AISLE” means an internal roadway adjacent to a parking or loading space which provides vehicular ingress and egress to and from the parking or loading space.*

b. That section 2 be amended by adding the following definitions:

“PARKING ANGLE” means the angle not exceeding 90° formed by the intersection of the side of a parking space and a line parallel to the adjacent aisle or driveway.

“PARALLEL PARKING SPACE” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a parking not exceeding 15°, and having a minimum width of 2.75 m (9.0 ft.) and a minimum length of 7.25 m (23.8 ft.), exclusive of any aisle or driveway.

“PARKING SPACE - DISABLED” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a minimum width of 4.6 m (15.1 ft.) and a minimum length of 5.2 m (17.1 ft.), exclusive of any aisle or driveway, and specifically designated in accordance with The Corporation of the City of Mississauga’s Disabled Persons Parking By-law.

c. That clause 6(26)(2) be deleted and the following be substituted therefor:

(2) *Where land is used for a purpose set forth in Column 1 and/or Column 2 in Schedule “I” of this section, parking and loading spaces shall be provided and maintained on the same lot in accordance with the prescribed minimum standards in Column 3 for each such use.*

d. That clause 6(26)(3) be deleted and following be substituted therefor:

(3) *Parking spaces - disabled shall be provided and maintained on the same lot in proximity to the main entrances to a building or structure in accordance with the minimum standards prescribed in the following table:*

<u>Total Number of Required Parking Spaces</u>	<u>Minimum Number of Required Parking Spaces - Disabled</u>
0 - 9	Nil
10 - 100	1
101 - 2 500	1% of the total required parking spaces
2 501 and greater	25

e. That clause 6(26)(6) be deleted.

f. That section 6 be amended by adding the following subsection:

AISLE WIDTH

(1) *The minimum aisle width shall be 7.0 m (23.0 ft.).*

(2) *Notwithstanding clause (1) of this subsection, the minimum aisle width may be 5.5 m (18.0 ft.) only where a one-way aisle is provided for ingress and egress to and from parking spaces with a parking angle not exceeding 60°.*

3. That Zoning By-law 1227 (former Town of Port Credit) be amended as follows:

a. That subsections 4(45) and (47) be deleted and the following be substituted therefor:

(45) *“AISLE” means an internal roadway adjacent to a parking and loading space which provides vehicular ingress and egress to and from the parking or loading space.*

(47) *“PARKING SPACE” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a minimum width of 2.75 m (9.0 ft.) and a minimum length of 5.2 m (17.1 ft.), exclusive of any aisle or driveway.*

b. That section 4 be amended by adding the following definitions:

“PARKING ANGLE” means the angle not exceeding 90° formed by the intersection of the side of a parking space and a line parallel to the adjacent aisle or driveway.

“PARALLEL PARKING SPACE” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a parking angle not exceeding 15°, and having a minimum width of 2.75 m (9.0 ft.) and a minimum length of 7.25 m (23.8 ft.), exclusive of any aisle or driveway.

“PARKING SPACE - DISABLED” means an unobstructed rectangular area for the temporary parking or storage of a motor vehicle, having a minimum width of 4.6 m (15.1 ft.) and a minimum length of 5.2 m (17.1 ft.), exclusive of any aisle or driveway, and specifically designated in accordance with The Corporation of the City of Mississauga’s Disabled Persons Parking By-law.

c. That clause 6(21)(2) be deleted and the following be substituted therefor:

(2) *Where land is used for a purpose set forth in Column 1 and/or Column 2 in Schedule “A”, which is part of this By-law, parking and loading spaces shall be provided and maintained on the same lot in accordance with the minimum standards prescribed in Column 3 for each such use.*

d. That clause 6(21)(3) be deleted and the following be substituted therefor:

(3) *Parking spaces - disabled shall be provided and maintained on the same lot in proximity to the main entrances to a building or structure in accordance with the minimum standards prescribed in the following table:*

<u>Total Number of Required Parking Spaces</u>	<u>Minimum Number of Required Parking Spaces - Disabled</u>
0 - 9	Nil
10 - 100	1
101 - 2 500	1% of the total required parking spaces
2 501 and greater	25

- e. That clause 6(21)(6) be deleted.
- f. That section 6 be amended by adding the following subsection:

AISLE WIDTH

- (1) *The minimum aisle width shall be 7.0 m (23.0 ft.).*
 - (2) *Notwithstanding clause (1) of this subsection, the minimum aisle width may be 5.5 m (18.0 ft.) only where a one-way aisle is provided for ingress and egress to and from parking spaces with a parking angle not exceeding 60°.*
4. That the By-law Enforcement Division of the Corporate Services Department prepare amendments to Disabled Persons Parking By-law 134-83, as amended, regarding the width and the total number of parking spaces designated for the disabled in accordance and concurrently with the proposed amendments to the Zoning By-laws.

TABLE OF CONTENTS

	<i>Page</i>
1.0 BACKGROUND	1
2.0 ZONING BY-LAWS PROVISIONS	1
3.0 PARKING SPACE AND AISLE REVIEW	2
3.1 Parking Module	2
3.2 Vehicle Dimensions	3
3.3 Changes in Vehicle Dimensions	4
3.4 Comparison of Parking Space and Aisle Standards with Other Municipalities ...	5
3.5 Side Door Clearance Space	5
3.6 Proposed Revised Definition of “PARKING SPACE”	6
3.7 Definition of “AISLE”	7
3.8 Legal Non-Conforming Parking Spaces	7
3.9 Committee of Adjustment Variances	7
3.10 Payment-in Lieu of Off-Street Parking Program (PIL)	8
4.0 ANGLED PARKING	9
4.1 Zoning By-law Provisions	9
4.2 Requirements of Other Municipalities	9
4.3 Proposed Aisle Width for Angled Parking	9
4.4 Effects of Allowing Angled Parking	10
4.5 Parallel Parking	10
4.6 Proposed Revised Definition of “AISLE”	10
5.0 REVIEW OF PARKING PROVISIONS FOR THE DISABLED	11
5.1 Zoning By-laws Provisions	11
5.2 Disabled Persons Parking By-law 134-83, As Amended	11
5.3 Discrepancies of Parking Provisions for the Disabled Between the Zoning By-laws and the Disabled Persons Parking By-law 134-83	12
5.4 Highway Traffic Act, R.R.O. 1990, REG. 581 - Disabled Person Parking Permits	12
5.5 Comparison of Parking Provisions for the Disabled with Other Municipalities ..	12
5.6 Proposed Revised Parking Provisions for the Disabled	13
5.7 Proposed Revisions to the Disabled Persons Parking By-law 134-83, As Amended	16
6.0 CONCLUSION	16
7.0 RECOMMENDATIONS	17
APPENDICES and SKETCHES	

TABLES

	<i>Page</i>
1. Number of Variances in Parking Space Dimensions and/or Aisle, 1989-1998	8
2. Discrepancies of Parking Provisions for the Disabled	12
3. Parking Spaces Designated for the Disabled on 12 Surveyed Sites, June and November 1999	14

APPENDICES

- A. Summary of Vehicle Dimensions (1998 Models)
- B. Average Dimensions of Vehicle Models, 1985 - 1998
- C. Parking Space Dimensions and Aisle Widths of Selected Municipalities
- D. Angled Parking Space Provisions of Selected Municipalities
- E. Parking Provisions for the Disabled of Selected Municipalities

SKETCHES

- 1. Parking Lot with Existing Parking Space Dimensions Standard
- 2. Parking Lot with Proposed Parking Space Dimensions Standard
- 3a. Parking Lot with 75° Angled Parking
- 3b. Parking Lot with 60° Angled Parking
- 3c. Parking Lot with 45° Angled Parking
- 4. Comparison between Parallel Parking and 30° Angled Parking

APPENDICES

- A. Summary of Vehicle Dimensions (1998 Models)
- B. Average Dimensions of Vehicle Models, 1985 - 1998
- C. Parking Space Dimensions and Aisle Widths of Selected Municipalities
- D. Angled Parking Space Provisions of Selected Municipalities
- E. Parking Provisions for the Disabled of Selected Municipalities

SKETCHES

1. Parking Lot with Existing Parking Space Dimensions Standard
2. Parking Lot with Proposed Parking Space Dimensions Standard
- 3a. Parking Lot with 75° Angled Parking
- 3b. Parking Lot with 60° Angled Parking
- 3c. Parking Lot with 45° Angled Parking
4. Comparison between Parallel Parking and 30° Angled Parking