



The City That Soars!

REQUEST FOR PLANNING COMMISSION ACTION

Meeting Date	May 22, 2012
Agenda Item	Workshop
Title	Orientation on potential parking requirement changes related to storm water management
Submitted By	Deborah Jones, Staff Liaison

Description	The Commission will receive information from staff on recommended updates to the City's off-street parking ordinances designed to improve management of storm water run-off.
Background	<p>As part of the City's ongoing efforts to promote best practices in the reduction of storm water run-off and the improvement of water quality, staff recommends amending Sections 113-314 and 113-315 of the City Code to reduce the amount of impervious surface required for parking and to allow alternative designs for parking lot margins. These measures are encouraged by the Metropolitan Council.</p> <p>The proposed changes are a reduction in parking space size from 9' x 20' to 9' x 18' and a reduction in minimum required width of parking lot aisles to 24 feet, dimensions in line with today's standards and the recommendations of the Metropolitan Council. The amendment would also allow alternate curbing and pavement edge designs to direct runoff water to filtration basins and rain gardens at the discretion of the zoning administrator and city engineer.</p>
Budget Impact	Unknown
Attachment(s)	<ul style="list-style-type: none"> • Portions of Falcon Heights City Code, Sections 113-314 and 113-315 • Parking Lot Design BMP - Metropolitan Council • Parking Stalls and Driveway Design Guidelines - City of Menlo Park, CA • Parking Lot Design (excerpt) - publication of Asphalt Paving Association of Iowa
Action(s) Requested	<ul style="list-style-type: none"> • None at this time. The purpose of this workshop is to provide information and background in preparation for a public hearing and Commission action in June. The ordinance amendment draft will be provided prior to the hearing.

Subdivision II. - Off-Street Parking

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Sec. 113-314. - Miscellaneous provisions.

...

(c) *Parking spaces.*

(1) Each parking space shall not be less than nine feet wide and 20 feet in length exclusive of an adequately designed system of access drives. Smaller spaces for parking to be used only by compact cars may be permitted if approved by the city council.

(2) Parking lots that separate vehicles based on size may be designed with parking spaces less than or greater than nine feet wide and 20 feet in length depending upon the size of the vehicle as long as adequate space is provided for easy and safe ingress and egress for the vehicle.

(3) Proposed reductions in or additions to the parking space size must be submitted in a dimensioned site plan with the sizes of the vehicles to use parking spaces indicated to the zoning administrator for review and approval.

(4) Signs specifying the vehicle size to use the parking space may be required by the zoning administrator.

(5) Parking spaces for the handicapped shall not be less than 12 feet wide and 20 feet in length.

...

(Code 1993, § 9-13.04(5); Ord. No. 0-91-10, § 1, 6-19-1991; Ord. No. 0-96-01, § 4, 2-28-1996)

Sec. 113-315. - Design and maintenance of off-street parking areas.

...

(b) *Calculating space.* When the calculation of the number of off-street parking spaces required results in a fraction, such fraction shall require a full space.

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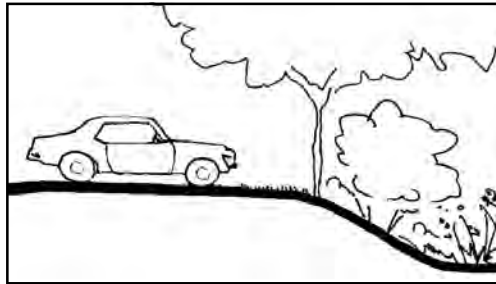
(f) *Curbing and landscaping.* All open off-street parking area designed to have head-in parking along the property line shall provide a bumper curb not less than five feet from the side property line or a guard of normal bumper height no less than three feet from the side property line. When said area is for six spaces or more, a curb or screening not over four feet in height shall be erected along the front yard setback line and grass or planting shall occupy the space between the sidewalk and curb or screening. Wheel guards as approved by the zoning administrator may be utilized.

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(k) *Determination of areas.* The parking space per vehicle shall not be less than 350 square feet of parking and maneuvering area or an area equal to the width of the parking space multiplied by the length of the parking space plus 15 feet.

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Impervious Surface Reduction Parking Lot Design



Description

Two main strategies can help reduce runoff volume or provide water quality benefits in parking lots: reducing paved surface area and incorporating plants and infiltration swales into designs.

Reduced Paved Surface

Pavement reduction can be accomplished in three main ways:

- *Changing municipal codes to reduce parking requirements.* To avoid excessive paving, codes should set a minimum *and* maximum number of spaces a development can provide. Parking demand ratios should be based on site-specific parking generation studies.
- *Reducing stall dimensions.* This can be accomplished by creating dedicated compact car spaces and then offering spillover parking areas with pervious surfaces. Determine the most space-efficient design for the site, which may be angle parking (to reduce driving lane width) or conventional stalls.
- *Promoting shared parking lots.* Allow shared lots between businesses with peak parking demand at different times of the day or week. For example, a restaurant that requires parking primarily evenings and weekends could share parking with an office building with weekday parking needs.

Planting Strategies.

Vegetation is an effective and attractive way to reduce runoff, and smaller parking lots free up more space for landscaping.

Leaves, stems and branches intercept rainwater, which then evaporates. A significant amount of stormwater can evaporate from beds of tall grasses, wildflowers, shrubs, and trees. Furthermore, deep-rooted prairie plants create channels that help encourage infiltration (see Figure 1). They also hold up to a half-inch of stormwater on their leaves and in the thatch they create.

Purpose

	Water Quantity
Flow attenuation	<input type="checkbox"/>
Runoff volume reduction	<input checked="" type="checkbox"/>

	Water Quality
Pollution prevention	
Soil erosion	<input type="checkbox"/>
Sediment control	<input checked="" type="checkbox"/>
Nutrient loading	<input checked="" type="checkbox"/>

Pollutant removal (*only if runoff is directed into planted swales*)

Total suspended sediment (TSS)	<input checked="" type="checkbox"/>
Total phosphorus (P)	<input checked="" type="checkbox"/>
Nitrogen (N)	<input checked="" type="checkbox"/>
Heavy metals	<input checked="" type="checkbox"/>
Floatables	<input checked="" type="checkbox"/>
Oil and grease	<input checked="" type="checkbox"/>
Other	
Fecal coliform	<input type="checkbox"/>
Biochemical oxygen demand (BOD)	<input type="checkbox"/>

<input checked="" type="checkbox"/>	Primary design benefit
<input checked="" type="checkbox"/>	Secondary design benefit
<input type="checkbox"/>	Little or no design benefit

Impervious Surface Reduction Parking Lot Design

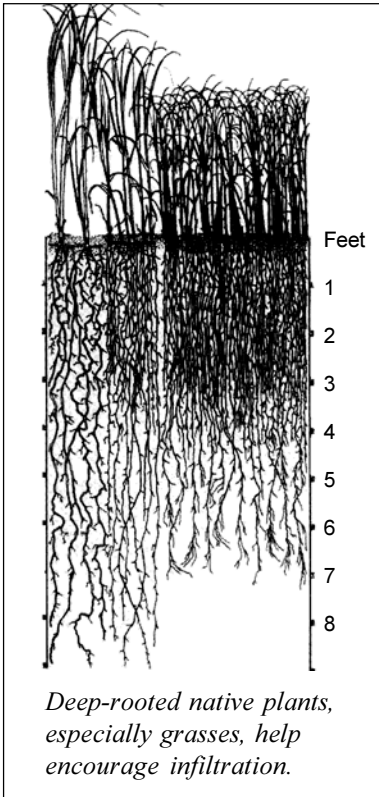


Figure 1

Shallow-rooted turf grass is not nearly so effective; substitute deep-rooted perennial plantings for sod wherever possible.

Even if extensive perennial planting is not possible, include trees to canopy paved areas. In addition to intercepting rainwater, the summer shade they provide helps to reduce the urban heat island effect and make parking lots more pleasant places to be.

Infiltration

Planted areas can also be designed specifically to accept runoff of parking areas (as shown in Figures 2, 3 and 4), providing temporary storage and on-site infiltration. See Rain Garden information in On-Lot Infiltration BMP.

Advantages

- Reducing parking surface reduces the need for stormwater runoff management.
- Less paving means lower development and maintenance costs.
- Grasses, wildflowers, shrubs and trees hold water that is then evaporated, reducing runoff.
- Channels created by deep roots encourage infiltration.
- Shade from trees helps reduce the urban heat island effect and make the area more comfortable for people.

- Planting native vegetation creates wildlife habitat.
- A variety of vegetation creates a more interesting and aesthetically pleasing environment.
- Trees shade impermeable surfaces, keeping stormwater cool and reducing urban heat island effect.

Limitations

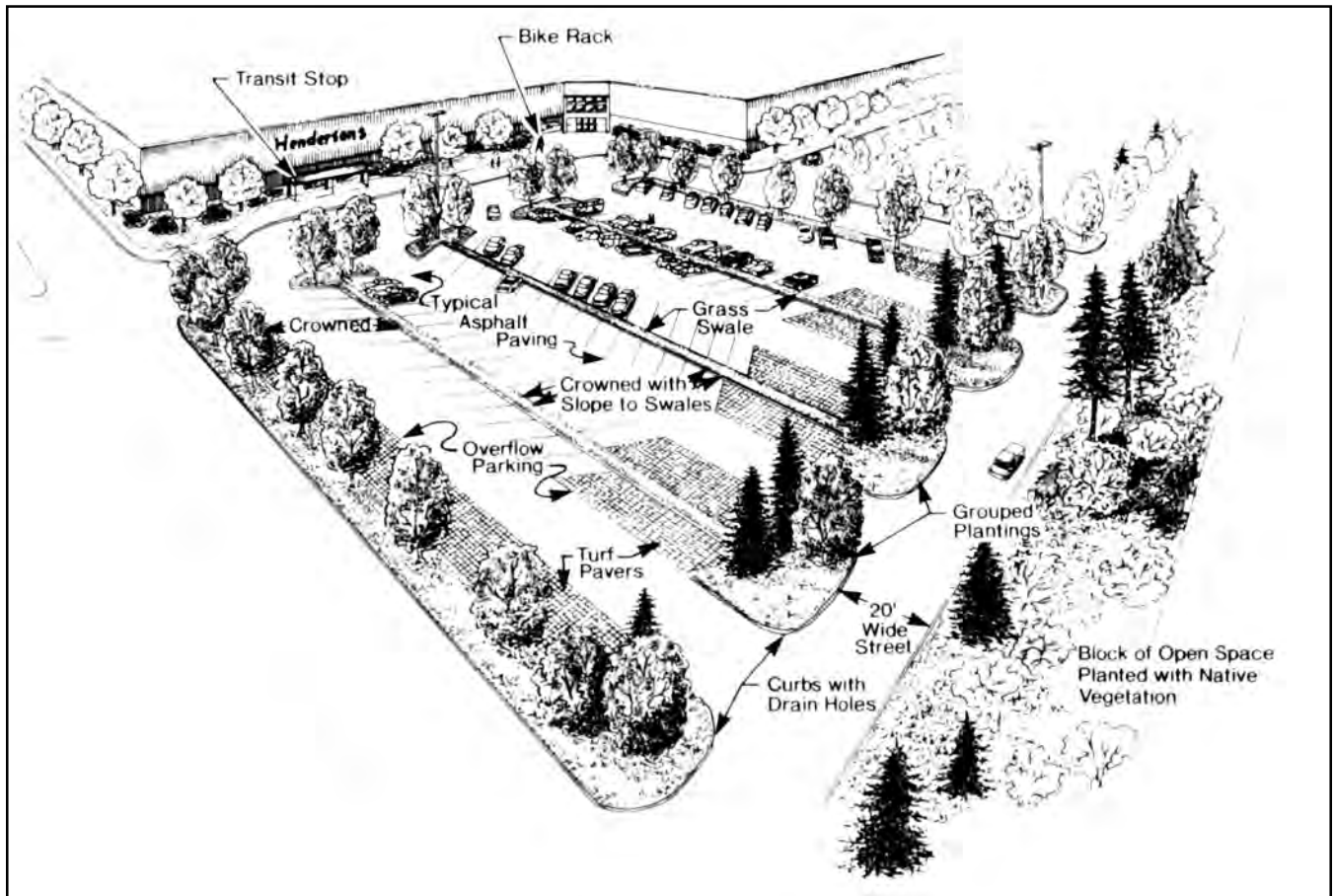
- Municipalities may have firm parking requirement that do not encourage innovation.
- Space allocated for parking lot in a given development may not be sufficient to include significant planted areas.
- Soil type may limit infiltration and/or planting success.

Land Use	"Better Site Design" Parking Ratio
Single family home	2 spaces or less per dwelling unit (driveway spaces count)
Professional offices	3.0 spaces or less per 1,000 ft. ² gross floor area
Retail	4.0 - 4.5 spaces or less per 1,000 ft. ² gross floor area

Table 1

Source: Adapted from CWP, 2000.

Impervious Surface Reduction Parking Lot Design



Source: Robert W. Droll, ASLA, in Wells 1994.

Requirements Design

- Revise outdated, overly generous parking ratio requirements. (See Table 1.)
- Use minimum stall dimensions.
- Use the most space-efficient stall configuration for the site (See Turf Pavers BMP).
- In larger commercial parking lots, design 30 percent of the spaces for compact cars only.
- Use pervious surfacing in summer spillover parking areas.
- If soils are suitable, drain parking lot runoff into infiltration islands using curb cuts or flat curbs.
- If soils are unsuitable, excavate to a depth of 3 feet and fill with a planting soil mix.
- Plant native or vigorous nonnative perennials rather than turfgrass over as much of non-paved surfaces as possible. See Plant List on following page.

Impervious Surface Reduction Parking Lot Design

- Aim to have canopy trees at maturity cover at least 50 percent of paved surfaces. Since tree height and spread will generally be smaller than normal in parking lot growing conditions, compensate by planting more trees closer together.
- Irrigation systems are usually necessary for parking lot island plantings, unless sufficient runoff is directed into them..

Requirements Construction

- To avoid compaction, do not drive on planting areas during construction.
- After construction, loosen soils in planting areas to a depth of 24 inches, to a maximum compaction of 85 percent standard proctor density. Till the upper 10 inches of soil.

Maintenance

- Planted areas must be weeded monthly during the first two to three years. After that, weeding once or twice a growing season may suffice.
- Regular watering will be necessary during dry spells. Limit irrigation to a maximum of two inches per week.
- During winter plowing, push street snow away from swales whenever possible in order to avoid accumulation of road sand.

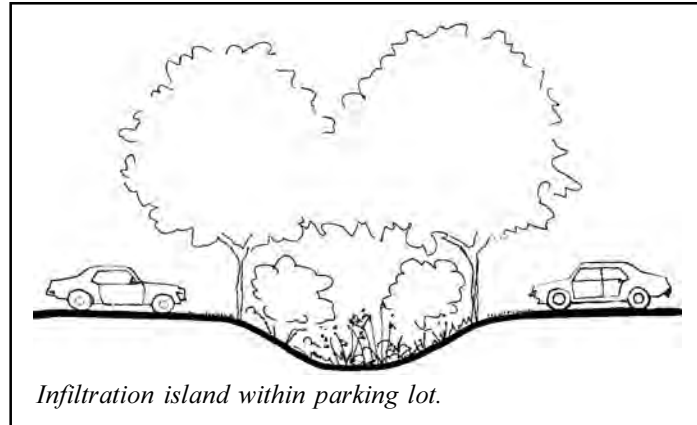


Figure 3

Source: VBWD, 2000

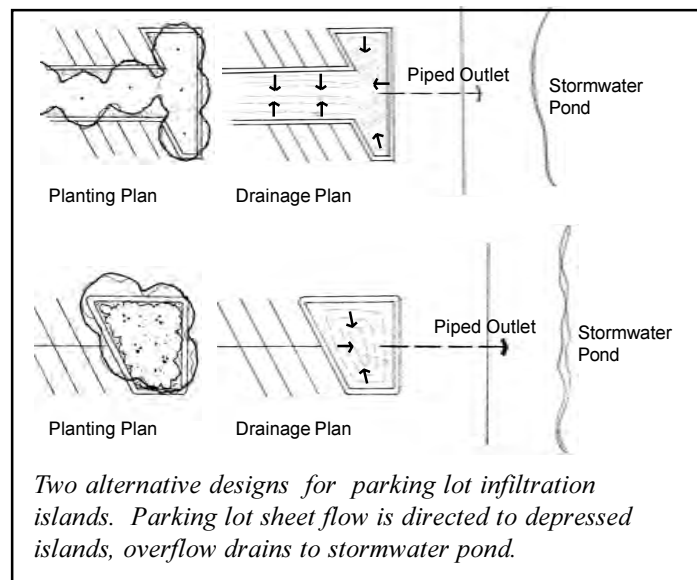


Figure 4

Source: VBWD, 2000

Impervious Surface Reduction Parking Lot Design

Rainwater Gardens Plant List

Source: Fred Rozumalski, Barr Engineering

Mesic-Dry Soils (Sunny)

Native

Butterfly Flower	<i>Asclepias tuberosa</i>
Purple Prairie Clover	<i>Dalea purpureum</i>
Purple Coneflower	<i>Echinacea purpurea</i>
Bee balm	<i>Monarda fistulosa</i>
Little Bluestem	<i>Schizachyrium scoparium</i>
Spiderwort	<i>Tradescantia bracteata</i>

Non-Native

Yarrow 'Coronation Gold'	<i>Achillea 'Coronation Gold'</i>
Feather Reed Grass 'Karl Foerster'	<i>Calamagrostis 'Karl Foerster'</i>
Daylily	<i>Hemerocallis spp.</i>
Blazingstar 'Kobold'	<i>Liatris 'Kobold'</i>
Silverfeather Grass	<i>Miscanthus sinensis</i>
Garden Phlox	<i>Phlox paniculata</i>
Black-Eyed Susan 'Goldsturm'	<i>Rudbeckia fulgida 'Goldsturm'</i>

Mesic-Dry Soils (Shady)

Native

Wild Columbine	<i>Aquilegia canadensis</i>
Wild Geranium	<i>Geranium maculatum</i>
Obedient Plant	<i>Physostegia virginiana</i>
Jacob's Ladder	<i>Polemonium reptans</i>
Solomon's Seal	<i>Polygonatum biflorum</i>
Zig Zag Goldenrod	<i>Solidago flexicaulis</i>
Canada Violet	<i>Viola canadensis</i>
Culver's Root	<i>Veronicastrum virginium</i>

Non-Native

White Comfrey	<i>Symphytum grandiflorum</i>
Tufted Hair Grass	<i>Deschamsia caespitosa</i>
Bigroot Geranium	<i>Geranium macrorrhizum</i>
Daylily	<i>Hemerocalis spp.</i>
Hosta 'Royal Standard'	<i>Hosta 'Royal Standard'</i>
Tigerlily	<i>Lilium tigrinum</i>

Wet Soil (Sunny)

Native

Giant Hyssop	<i>Agastache foeniculum</i>
Canada Anemone	<i>Anemone canadensis</i>
Marsh Milkweed	<i>Asclepias incarnata</i>
New England Aster	<i>Aster novae-angliae</i>
Turtlehead	<i>Chelone glabra</i>
Joe-Pye Weed	<i>Eupatorium maculatum</i>
Obedient Plant	<i>Physostesia virginianum</i>
Boneset	<i>Eupatorium perfoliatum</i>
Queen of the Prairie	<i>Filpendula rubra</i>
Blueflag Iris	<i>Iris versicolor</i>
Great Blue Lobelia	<i>Lobelia siphilitica</i>
Switchgrass	<i>Panicum virgatum</i>
Mountain Mint	<i>Pycnanthemum virginianum</i>
Tall Meadow Rue	<i>Thalictrum dasycarpum</i>
Culvers Root	<i>Veronicastrum virginicum</i>
Golden Alexander	<i>Zizia aurea</i>

Non-Native

Joe-Pye 'Gateway'	<i>Eupatorium purpurescens 'Gateway'</i>
Daylily	<i>Hemerocalis spp.</i>
Siberian Iris	<i>Iris sibirica</i>
Tigerlily	<i>Lilium tigrinum</i>
Switchgrass 'Heavy Metal'	<i>Panicum virgatum 'Heavy Metal'</i>

-list continued on next page-

Impervious Surface Reduction Parking Lot Design

Plant List (continued)

Wet Soils (Shady)

Native

Cardinal Flower	<i>Lobelia cardinalis</i>
Ostrich Fern	<i>Matteuccia struthiopteris</i>
Virginia Bluebells	<i>Mertensia virginica</i>
Sensitive Fern	<i>Onoclea sensibilis</i>

Non-Native

Pink Turtlehead	<i>Chelone layonii</i>
Daylily	<i>Hemerocalis spp.</i>
Obedient Plant	<i>Physostegia virginiana</i>

Shrubs (Sunny)

Black Chokeberry	<i>Aronia melanocarpa</i>
Red-Osier Dogwood	<i>Cornus sericia</i>
Low Bush Honeysuckle	<i>Diervilla Ionicera</i>
Annabelle Hydrangea	<i>Hydrangea arborescens</i> 'Annabelle'
Pussy Willow	<i>Salix discolor</i>
High Bush Cranberry	<i>Viburnum trilobum</i>

Shrubs (Shady)

Black Chokeberry	<i>Aronia melanocarpa</i> 'alata'
Red-Osier Dogwood	<i>Cornus sericia</i>
Low Bush Honeysuckle	<i>Diervilla Ionicera</i>
Annabelle Hydrangea	<i>Hydrangea arborescens</i> 'Annabelle'

Trees (consider soils when making selections)

Autumn Blaze Maple	<i>Acer x freemanii</i> 'Jeffersred'
Black Ash	<i>Fraxinus nigra</i> 'Fallgold'
Seedless Green Ash	<i>Fraxinus pennsylvanica</i> 'Marshall's Seedless'
Swamp White Oak	<i>Quercus bicolor</i>
Kentucky Coffeetree	<i>Gymnocladus dioica</i>

Sources

1. Center for Watershed Protection. 2000. "An Introduction to Better Site Design" in *Watershed Protection Techniques*. Vol. 3, No. 2. Ellicott City, MD.
2. Center for Watershed Protection. 1998. *Better Site Design: A Handbook for Changing Development Rules in Your Community*. Ellicott City, MD.
3. Schueler, Tom. 1995. *Site Planning for Urban Stream Protection*. Center for Watershed Protection, Silver Spring, MD.
4. Valley Branch Watershed District. 2000. *Alternative Stormwater Best Management Practices Guidebook*. Lake Elmo, MN.
5. Well, Cedar. 1994. "Skinny Streets and One-Sided Sidewalks: A Strategy for Not Paving Paradise" in *Watershed Protection Techniques*, Vol 1. No 3. Center for Watershed Protection. Ellicott City, MD.



PARKING STALLS AND DRIVEWAY DESIGN GUIDELINES

On March 18, 1996, the Planning Commission adopted guidelines for parking stalls and driveways. The guidelines standardize parking stall width dimensions and establish design criteria for review of driveway and parking lot circulation requests.

General Considerations

Parking Stall Dimensions:

Changes in the vehicle size have changed the parking space dimensions necessary to accommodate large cars and small cars. These vehicle changes have also reduced the aisle width requirements to access a parking stall. Large cars typically need approximately 9 feet of stall width to provide sufficient door opening width, and small cars need approximately 8 feet of stall width.

The one-size-fits-all designs are easier to execute for several reasons: 1) most drivers do not know the size of the vehicle or whether it is a large or small car; 2) most drivers take the first available space regardless of size; and 3) large cars parked in small-car spaces create problems by encroaching on adjacent spaces and possibly on the adjoining aisles.

- The Parking guidelines utilize a one-size-fits-all width of 8 feet 6 inches.

Driveway Design:

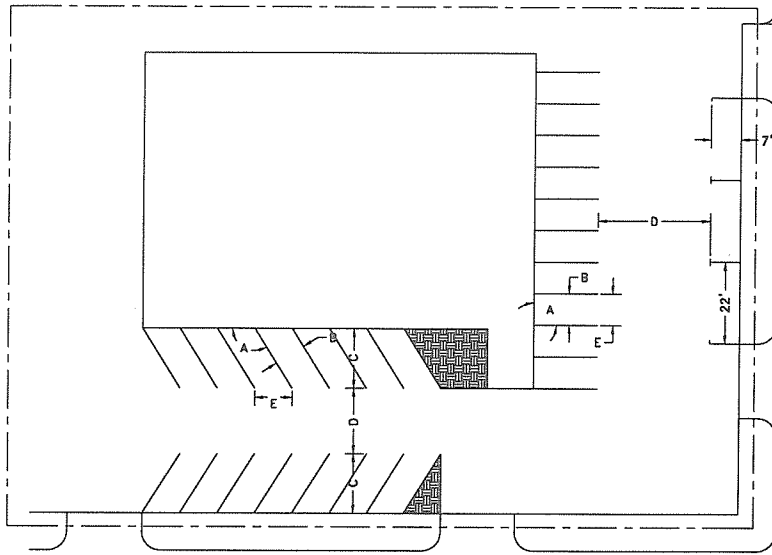
The safety and efficiency of a street depends on the amount and character of interference affecting vehicles moving along it. Significant interference is caused on most roads by vehicles entering, leaving, or crossing at intersecting streets and driveways. In order to minimize accidents and to assure best overall use of the road by the general public, it is necessary to regulate vehicle movements in and out of abutting developments and cross streets.

- The conflict effect of driveways is a function of traffic and pedestrian flow along the street and at the driveway.
- A low volume driveway causes relatively little conflict on a major street, and a high volume driveway causes little conflict on a minor route.
- In areas of high pedestrian activity, designs for low speed vehicular entry and exit may be based on radii and restricted total widths.
- Driveways should be designed for curb lane access with minimal encroachment on travel lanes.
- Design elements of each driveway (location, spacing, sight distance, throat width, radii, angles, and grades) should be based on expected volumes and vehicle characteristics.
- For right-turn entry and exit, the driveway radius should be consistent with the design vehicles sweep path requirements.
- Most driveway design elements are directly related to the layout of the parking area, amount of reservoir space, types of loading facility, circulation pattern, and building placement within the site.

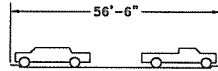
Please refer to the attached *Parking Area Design Guidelines, Handicap Parking Design Guidelines, Driveway Design Guidelines, and Driveways Grade Guidelines* information sheets for specifications and detailed information.

Source: The Dimensions of Parking - Urban Land Institute
National Parking Association, 1993

Parking Lot



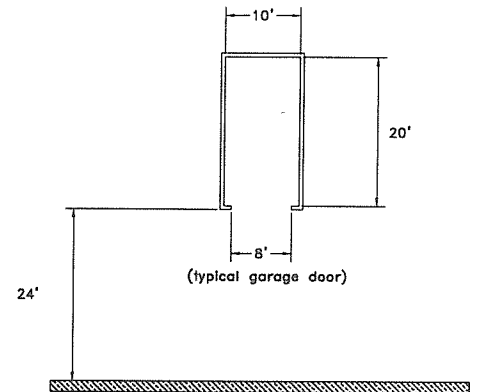
MINIMUM MODULE WIDTH (F)
FACE OF CURB



FACE OF CURB

** FOR 8.5' STALL WIDTH, TWO WAY

Parking Stall



Angle (Degrees) A	Width of Stall (B)	Stall 90 to Aisle (C)	Minimum Width of Aisle (D)		Width Stall, Parallel to Aisle (E)	Minimum Module Width (F)	
			One Way	Two Way		One Way	Two Way
0 (parallel)	7'-0"	22'-0"	—	—	—	—	—
45	8'-6"	16'-6"	12'-6"	20'	12'	45'-6"	53'
60	8'-6"	18'	14'-6"	20'	9'-10"	50'-6"	56'
75	8'-6"	18'	18'-6"	20'	8'-10"	54'-6"	56'
90	8'-6"	16'-6"	N/A	23'	8'-6"	N/A	56'

1. The Planning Commission reserves the right to modify the parking lot layout if, in their opinion, the layout illustrates a poor design but complies with the parking guidelines.
2. The Transportation Manager shall have the authority to alter these design guidelines if, in the opinion of the Transportation Manager, it is in the best interest of public safety.
3. Parking stalls that are adjacent to physical obstructions such as walls or utility devices must have an additional 1 foot of width for the parking stall.
4. Parking stalls in a single or two car garage should have minimum dimensions of 10' x 20' each. The back up area should be a minimum of 24' for an 8 foot garage door.

prkstd6b.dwg

Transportation Division
CITY OF MENLO PARK

APPROVED:

[Signature]
Transportation Manager

PARKING AREA DESIGN GUIDELINES

DATE: 3/28/96

Chapter 5

Parking Lot Design

GENERAL CONSIDERATIONS

The parking lot is the first - and the last - part of a building complex to be viewed by the user. It is the gateway through which all customers, visitors, and employees pass. This first impression is very important to the overall feeling and atmosphere conveyed to the user.

Developers want their new facilities to be attractive, well designed, and functional. Though many hours are spent on producing aesthetically pleasing building designs, the same design consideration for the parking area

is often overlooked. Pavements in parking areas that are initially under-designed can experience excessive maintenance problems and a shortened service life.

When properly designed and constructed, parking areas can be an attractive part of the facility that is also safe, and most important, usable to the maximum degree. In addition, parking areas should be designed for low maintenance costs and easy modification for changes in use patterns.



5-2 Parking Lot Design

The information in this chapter will provide a general guide to proper parking area design, construction, and facility layout. Minimum pavement thickness designs are given for various size parking lots, heavily-loaded areas, and industrial parking lots. In addition, this chapter gives comparable designs for both full depth asphalt pavements and asphalt over untreated aggregate base.

General Planning

In developing the parking area plan, several important details should be considered. First and foremost in the mind of the developer may be providing the maximum parking capacity in the available space while ensuring convenience and safety.



If the locality does not have a zoning ordinance identifying specific requirements for off-street parking, the general recommendations in Table 5-1 may be useful.

Rules have been developed for optimizing parking area space. Among them are the following:

1. Use rectangular areas where possible.
2. Make the long sides of the parking areas parallel.
3. Design so that parking stalls are located along the lot's perimeter.
4. Use traffic lanes that serve two rows of stalls.

Table 5-1. Recommended Parking Requirements

Land Use	Spaces/Unit
Residential	
Single-Family	2.0/Dwelling
Multifamily	
Efficiency	1.0/Dwelling
1 -2 Bedroom	1.5/Dwelling
Larger	2.0/Dwelling
Hospital	1.2/Bed
Auditorium/Theater/Stadium	0.3/Seat
Restaurant	0.3/Seat
Industrial	0.6/Employee
Church	0.3/Seat
College/University	0.5/Student
Retail	4.0/1000 GFA
Office	3.3/1000 GFA
Shopping Center	5.5/1000 GLA
Hotels/Motel	1.0/Room
	0.5/Employee
Senior High Schools	0.2/Student
	1.0/Staff
Other Schools	1.0/Classroom

GFA, sq. ft. of gross floor area

GLA, sq. ft. of gross leasable area

Special attention should be given to the flow of traffic in and out of the lot as well as circulating routes inside the lot. Keep entrances far away from busy street intersections and from lines of vehicles stopped at a signal or stop sign. Be sure that the entering vehicles can move into the lot on an internal aisle, thereby avoiding entering congestion caused by involvement with turning vehicles. A pedestrian traffic-flow study is important to provide information about both safety and convenience.



Parking Angle

The most popular angles for parking stalls are 60°, 45°, and 90°. The most common angle for parking is the 60° angle because of the ease of operation it provides. This angle permits reasonable traffic lane widths and eases entry and exit of the parking stall.

Where lot size restricts the dimensions available for aisles and stalls, a 45° angle may be used. The smaller change of direction required to enter and back-out of the stall space permits use of narrower aisles. The 45° angle reduces the total number of parking

spaces for a given area but is the only acceptable angle for a herringbone parking lot pattern.

The 90° parking angle provides the most parking spaces for a given area. The high degree of difficulty for entering and leaving these parking stalls makes this type of parking more suited to all-day parking, such as employee parking. This angle is generally not preferred for “in and out” lots such as those of fast food restaurants and banks.

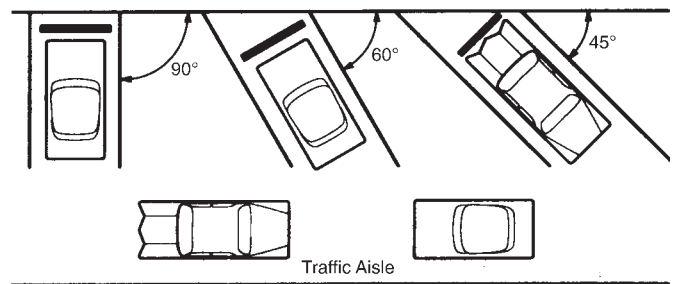


Figure 5-1. Parking lot angles

Parking Space Dimensions

Typical parking stall dimensions vary with the angle at which the stall is arranged in relation to the aisle. Stall widths (measured perpendicular to the vehicle when parked) range from 8-1/2 to 9-1/2 feet. The minimum width for public use parking spaces is 9 feet by 19 feet. Recommended stall dimensions for compacts and similar-sized vehicles are 7-1/2 feet by 15 feet. If a number of such spaces are to be provided, they should be grouped together in a prime area to promote their use. Stall widths for parking lots where shoppers generally have large packages, such as supermarkets and other similar parking facilities, should be 9-1/2 feet or even 10 feet wide.

5-4 Parking Lot Design

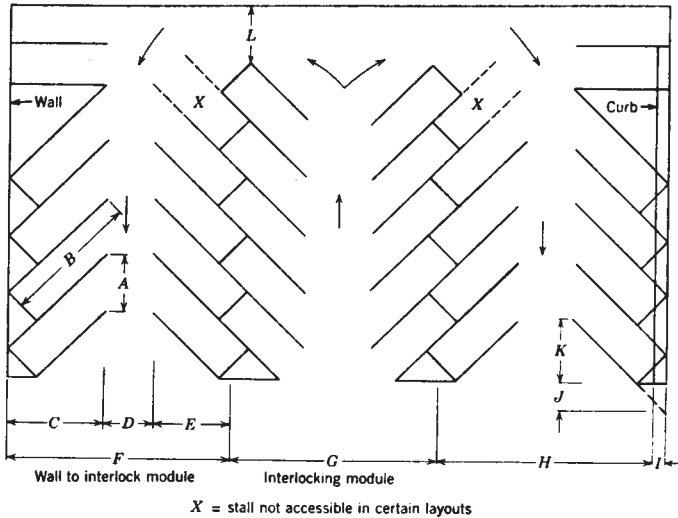


Figure 5-2.

Table 5-2. Parking layout dimensions (ft) for 9 ft stalls at various angles.

STALL LAYOUT ELEMENTS

Dimension	On diagram	On			
		45°	60°	75°	90°
Stall width parallel to aisle	A	12.7	10.4	9.3	9.0
Stall length of line	B	25.0	22.0	20.0	18.5
Stall depth to wall	C	17.5	19.0	19.5	18.5
Aisle width between stall lines	D	12.0	16.0	23.0	26.0
Stall depth, interlock	E	15.3	17.5	18.8	18.5
Module, wall to interlock	F	44.8	52.5	61.3	63.0
Module, interlocking	G	42.6	51.0	61.0	63.0
Module, interlock to curb face	H	42.8	50.2	58.8	60.5
Bumper overhang (typical)	I	2.0	2.3	2.5	2.5
Offset	J	6.3	2.7	0.5	0.0
Setback	K	11.0	8.3	5.0	0.0
Cross aisle, one-way	L	14.0	14.0	14.0	14.0
Cross aisle, two-way	M	24.0	24.0	24.0	24.0

Parking Lot Markings

Markings are a very important element of a good parking lot. The parking area should be clearly marked to designate parking spaces and to direct traffic flow. As specified in the Manual on Uniform Traffic Control Devices (MUTCD), parking on public streets should be marked out by using white traffic paint, except for dangerous areas, which should be marked in yellow.



However, yellow lines are commonly used in off-street parking lots. All pavement striping should be 4 inches in width.

New asphalt surfaces can be marked with either traffic paint or cold-applied marking tape. For best results with paint application, allow the Asphalt Concrete to cure for several days.

Construction Practices

Drainage Provisions

Drainage problems are frequently a major cause of parking area pavement failures. It is critical to keep water away from the subgrade soil. If the subgrade becomes saturated, it will lose strength and stability, making the overlying pavement structure susceptible to breakup under imposed loads.

Drainage provisions must be carefully designed and should be installed early in the construction process. Parking area surfaces should have a minimum slope of 2 percent or 1/4 inch per foot. They should be constructed so water does not accumulate at the pavement edge. Areas of high natural permeability may require an underdrain system to carry water away from the pavement substructure. Any soft or spongy area encountered during construction should be immediately evaluated for underdrain installation or for removal and replacement with suitable materials.