

SITE PLANNING

Circulation

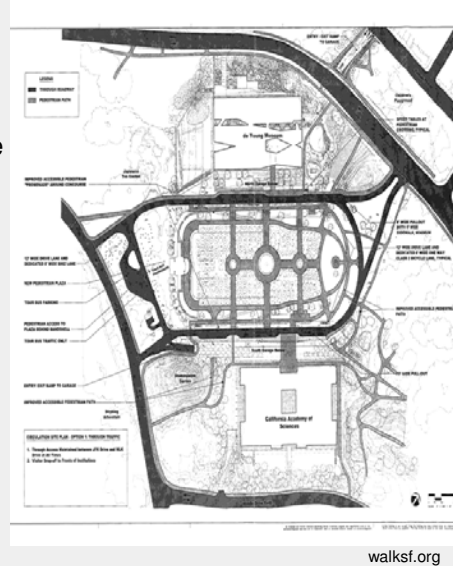
Streets and Roads

Land has little economic value if there is no access. A city can not exist without good circulation. Romans were so successful as empire builders because of their good roads.



Considerations:

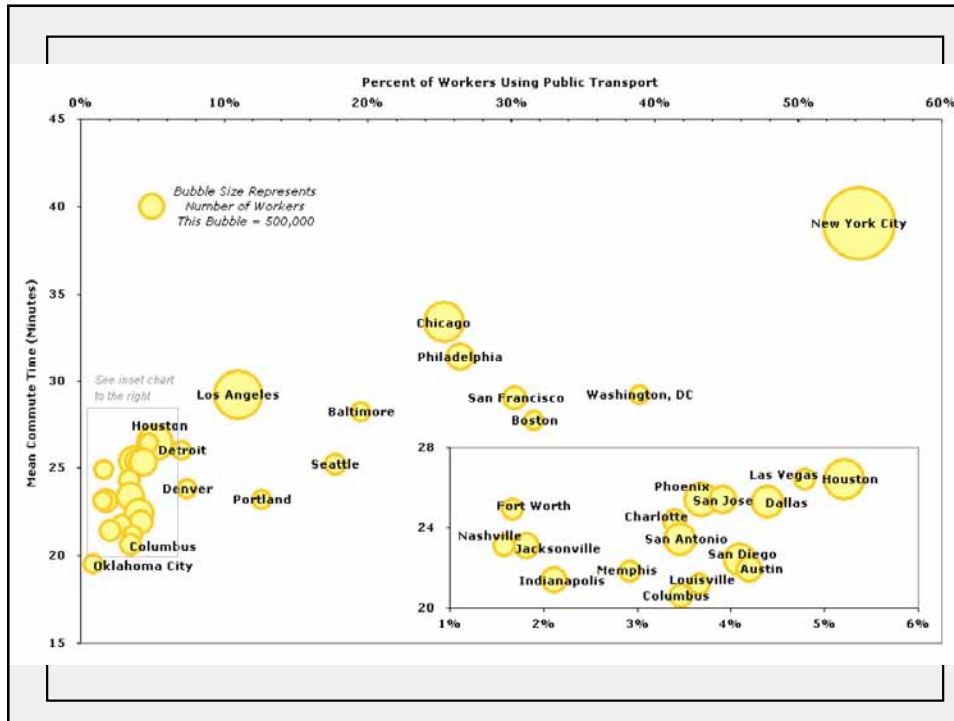
1. All elements of a site must be well serviced by appropriate circulation. Not equal.
2. Design of circulation must relate to the tempo of movement it accommodates, as well as to the general nature of its surroundings. cars fast, pedestrian slow.
3. Layout must satisfy functional demands of program.
4. Flexible for future development
5. In harmony with surroundings.



Influenced by

- concentration and density of population
- topography
- built environment





Transit Oriented Development (TOD)

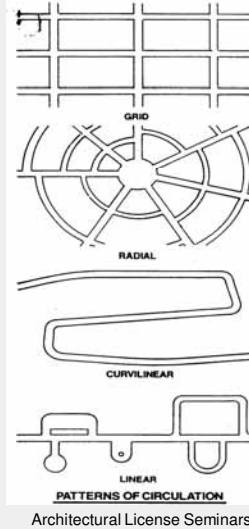
Development projects that provide pedestrian access to public transportation by building near existing transportation hubs.

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Types of vehicular circulation patterns

- Grid pattern
- Radial pattern
- Linear pattern
- Curvilinear pattern
- Switchback road



Grid Pattern

Grid pattern equally spaced streets, perpendicular to each other.



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Radial Pattern

Radial pattern
Central starting point

Growth in several directions.

Network connects multiple centers



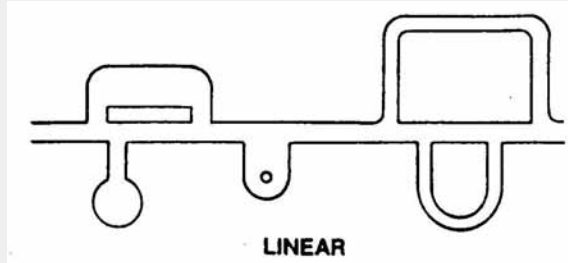
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Radial Pattern



Linear Pattern

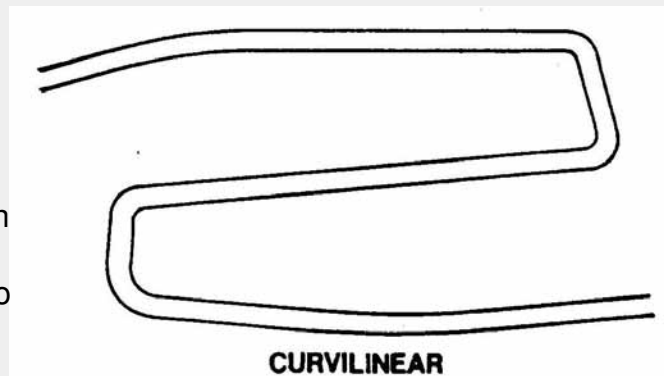
Linear pattern of circulation occurs along a series of straight lines. frontier town, and suburban strips



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Curvilinear

Curvilinear pattern of circulation generally follows land contours. Can also be used in flat areas to reduce traffic speeds and monotony.



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Switchback Road

Switchback road

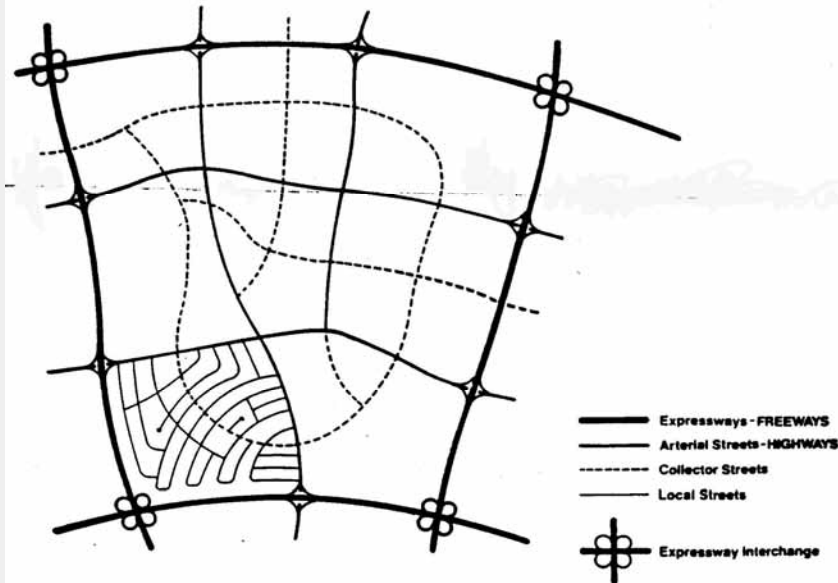
is a road that doubles back on itself with a hairpin curve.

Utilized to reduce grade in climbing steep topography



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Classification of Traffic Arteries



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Types of Streets

- Way
- Loop street
- Intersection
- Collector Street
- Interchange
- Network



ece.utexas.edu

Types of Streets - Way

Way is a street, alley, or other thoroughfare or easement permanently established for passage of persons or vehicles.

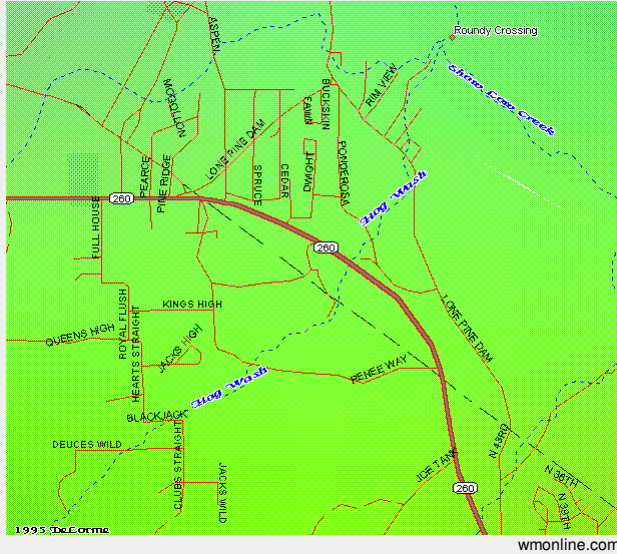


johnbarth.com

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Types of Streets - Loop street

Loop street is a minor street which comes off a major street, runs for a short distance, and then returns to the major street.



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Types of Streets - Intersection

Intersection is the point at which two streets come together or cross.



ci.puyallup.wa.us

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Types of Streets - Collector

Collector Street is a street into which minor streets empty and which leads to a major arterial. Tillary, Jay/Smith Streets

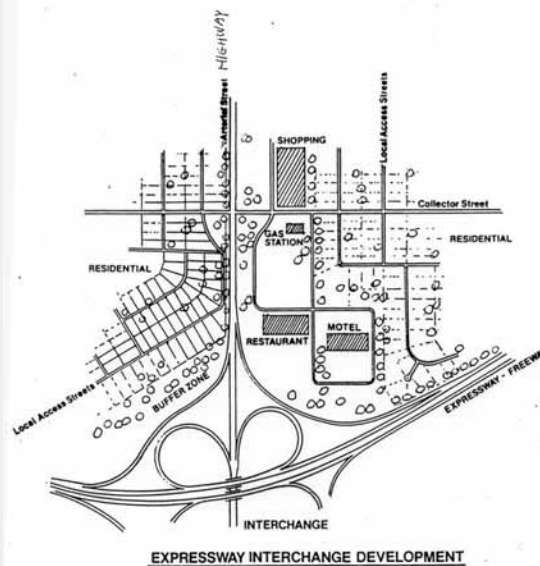


accsat.com

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Types of Streets - Interchange

Interchange is the junction of a freeway with entering or exiting traffic.



EXPRESSWAY INTERCHANGE DEVELOPMENT

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Types of Streets - Network

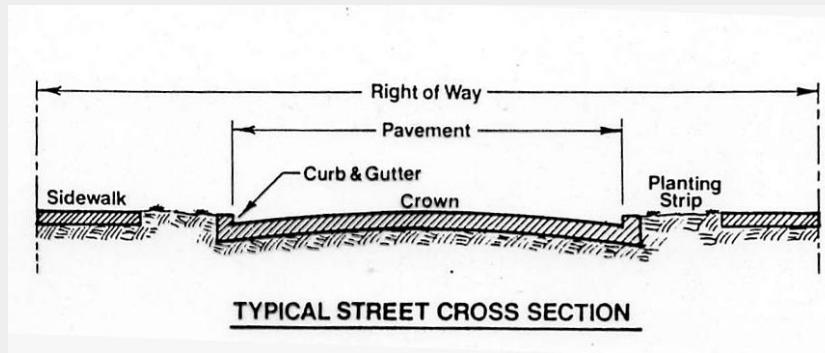
Network is a system of circulation channels which covers a large area.



berkeley.ca.u

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Street – Right of Way



TYPICAL STREET CROSS SECTION

PARKING

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- On street parking
- Off-street parking is space provided for vehicular parking outside the dedicated street right-of-way.
- At-grade parking lot
- Parking garages

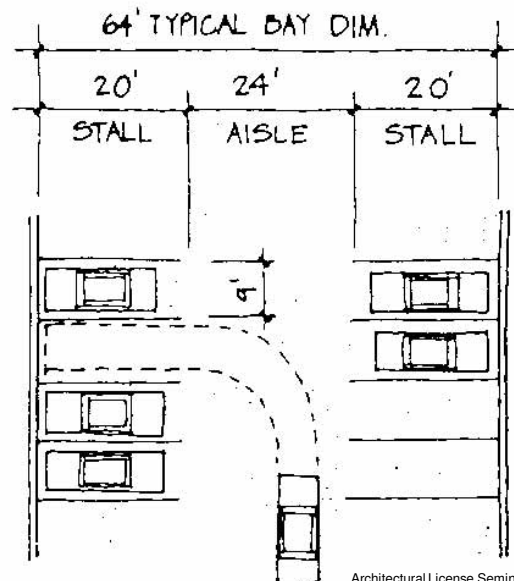


Reiser-Umemoto.com

Parking Dimensions 90 deg.

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- 90 deg, Angle
(20' x 9' stalls)
- 11.1 Cars for each 1000 lineal ft. of curb
 - 290 Square Ft. per car area requirement
 - Accommodates most Cars
 - Permits 2 way Traffic
 - More difficult to maneuver



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Parking Dimensions 60 deg.

60 deg, Angle (20' x 9' stalls)

- 9.7 Cars for each 1000 lineal ft. of curb
- 333 Square Ft. per car area requirement
- Easy access
- 1 way Traffic aisles
- Most popular configuration
- Relatively economical

64' TYPICAL BAY DIM.

23' CLEAR

18' AISLE 23' STALL

Wasted space

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Parking Dimensions 45 deg.

45 deg, Angle (20' x 9' stalls)

- 7.8 Cars for each 1000 lineal ft. of curb
- 333 Square Ft. per car area requirement
- Easy access
- 1 way Traffic aisles
- Relatively economical

52' TYPICAL BAY DIM.

16' CLEAR

11' AISLE 20'-6" STALL

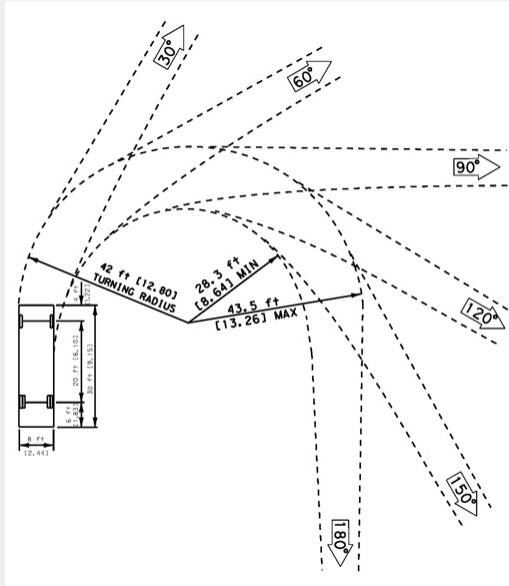
wasted space

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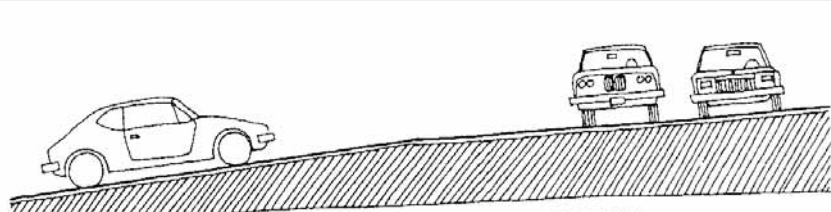
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Turning Radius

16' sub-compact
 25' for full sized cars
 45-50' for trucks, fire engines.



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AUTO DRIVEWAY RAMP SLOPE:
 1 FOOT RISE IN 10' RUN
 OR 1:10 (10% SLOPE)

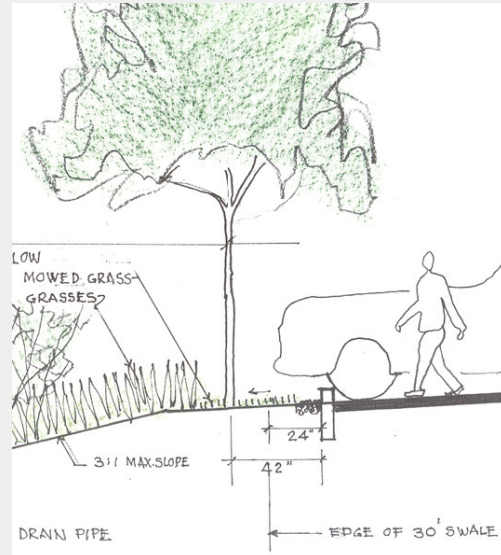
PARKING LOT SLOPE:
 1 FOOT RISE IN 20' RUN
 OR 1:20 (5% SLOPE)

MAXIMUM SLOPES FOR VEHICLES

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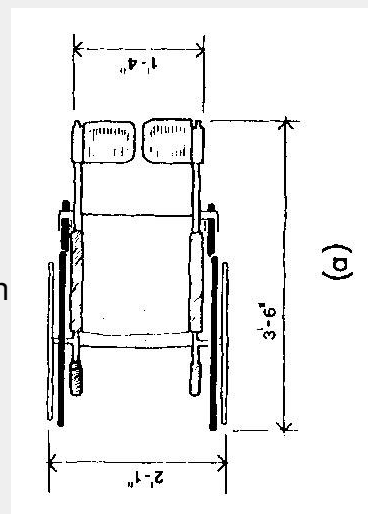
Wheel stops

A wheel stop prevents the car from hitting a wall or encroaching on an adjacent path or plantings.



Accessibility issues

- **Barrier-Free** - means having no environmental barriers, thereby permitting free access and circulation by the disabled.
- **Handicapped** - individuals have physical impairments that result in functional limitations.



Handicapped Parking

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Handicapped parking is a space designated for the physically handicapped persons, consisting of a typical space with an adjacent aisle no less than five feet wide and with the ability to reach an accessible route.

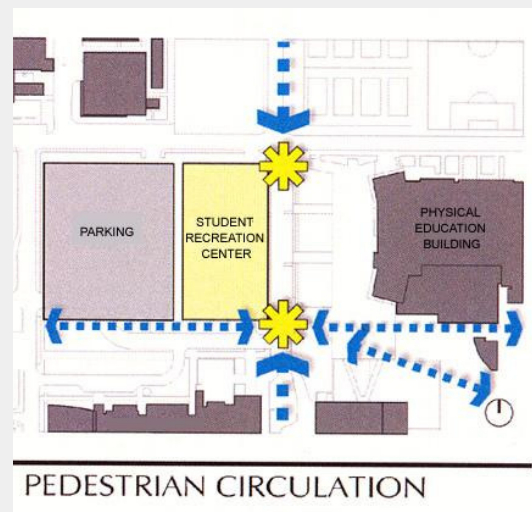


www.elitecrete.co

Pedestrian Circulation

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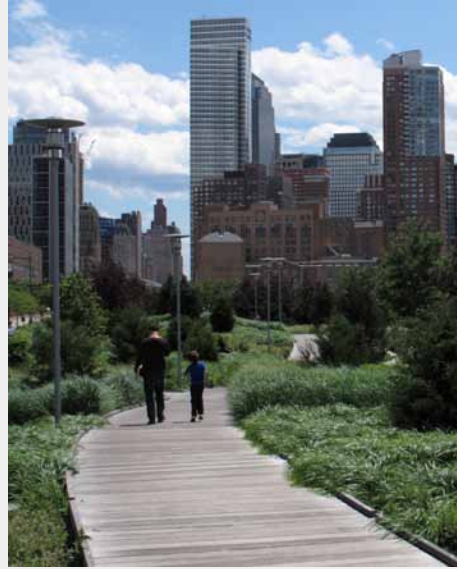
criteria, pedestrian systems, connections, paths, materials used, accessibility, lighting, signage.



asi.fullerton.edu

Pedestrian Circulation -Space

- average adult male 24" wide x 18" deep
- Easy movement requires 13 sq ft or a space of 4'-4" x 3'
- Crowd movement 7 sq ft or a space of 3'-6" x 2'
- more space is required on ramps and even more on stairs



Pedestrian Circulation -Capacity

varies with the characteristics of crowd and psychology (concert vs football) (cars vs subway)

- straight line vs random vs diagonal vs curving
- rule of thumb one way sidewalks- 5' wide; collector walks 6'-10' or more



bubbanfriends.org

Pedestrian Circulation -Direction

- People tend to walk in the line of least resistance direct path more curvilinear than straight.



kyle.irev.net

Pedestrian Circulation -Distance

people willing to walk about 1/2 mile or about 12 minutes

- influences spacing of subway stops;
- size of university, commercial developments
- radius of 1/4 mile covers 125 acres



Reiser-Umemoto.com

Pedestrian Circulation - Surfaces

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required characteristics:
stable and firm; relatively
smooth in texture, nonslip.

1. Soft (gravel, soil, soil and plants).
2. Variable (cobblestones, river stone, exposed aggregate, flagstone, sand-laid brick, wood decking)
3. Hard (asphalt, concrete, tile or brick in concrete)

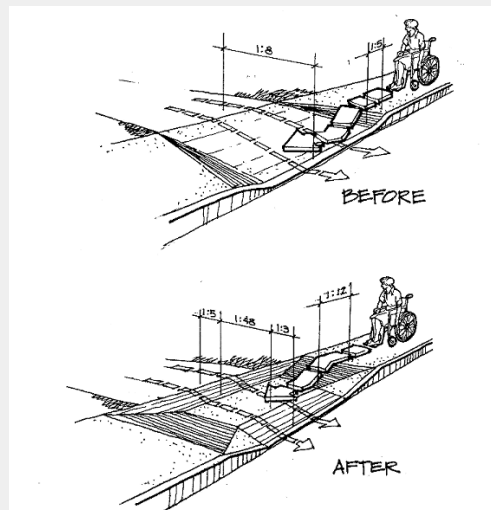


Pedestrian Circulation - Walkway gradients

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•Walks 1- 5% (1:100 to 1:20 gradient can be negotiated by handicapped but if 4-5% provide 5' level area every 100 feet; 3% slopes are preferred

•Ramps 5-8% 1:20 to 1:12 gradient

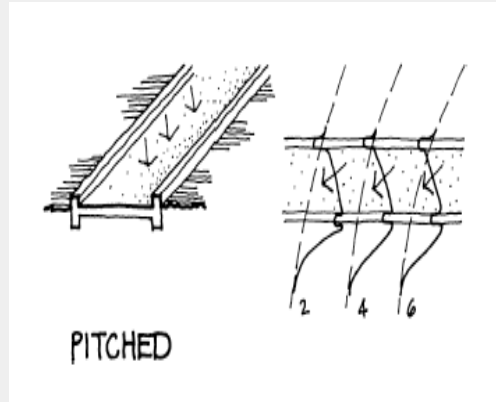


access-board.gov

Pedestrian Circulation - Drainage

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walkways slope laterally
1/4" per foot; wider walks
crowned



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Pedestrian Circulation – Curb cuts

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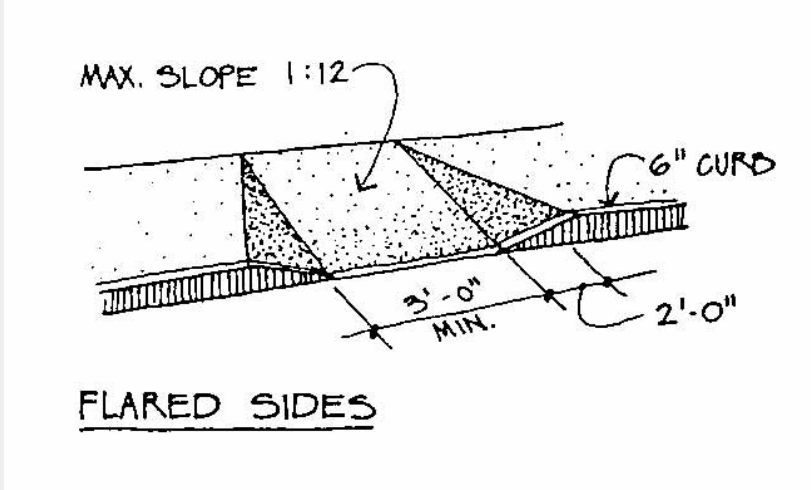
- maximum curb height should be 6 to 6-1/2 inches
- curb ramps should not exceed 8% or a 1:12 gradient
- nonslip surfaces but not corrugated which collects ice and snow and become slippery



pitt.edu

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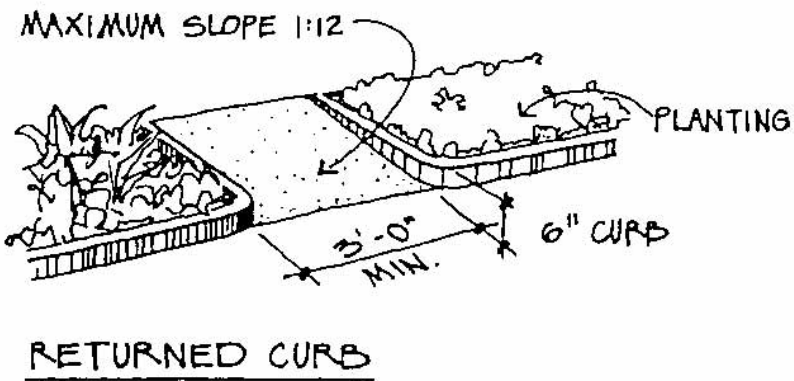
Flared Sides - Curb Ramp



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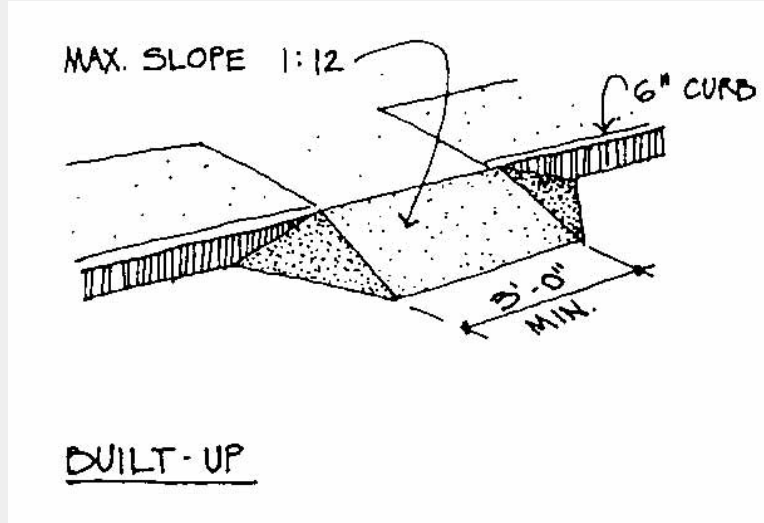
Returned Curb - Curb Ramp



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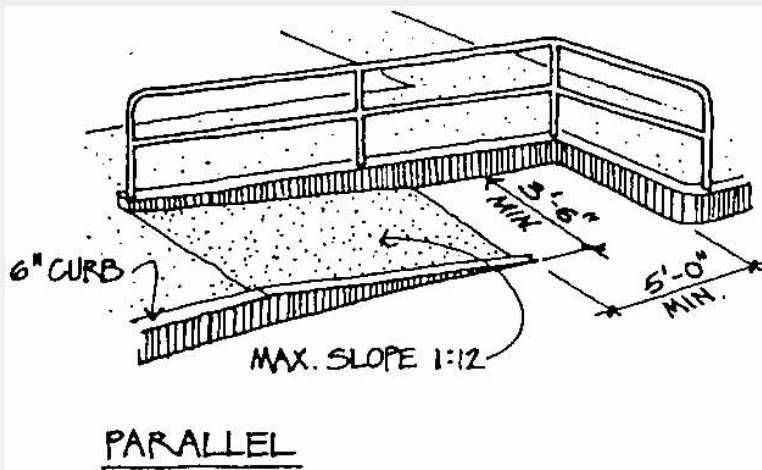
Built-Up - Curb Ramp



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Parallel - Curb Ramp



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Pedestrian Circulation - Stairs

- minimum of 3 risers NO 1 or 2 risers
- if more than 4 risers, provide handrail
- if more than 8' wide, provide center handrail for every multiple of 8'
- exterior stairs have different proportions than interior



arts.uwaterloo.ca

Pedestrian Circulation - Stairs

- exterior typically risers of 5-1/2" tread of 15" or 6" riser to 14" tread
- monumental stairs 3" riser & 19" tread or 4' riser & 17" tread; do not use in heavy traffic areas
- exterior stair rule 2 risers + tread = 26" to 27"
- public stairs never more than 50% gradient

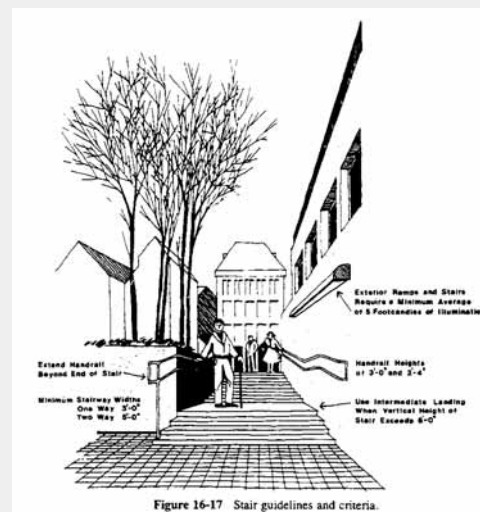


Figure 16-17 Stair guidelines and criteria.

Brooks, Site Planning

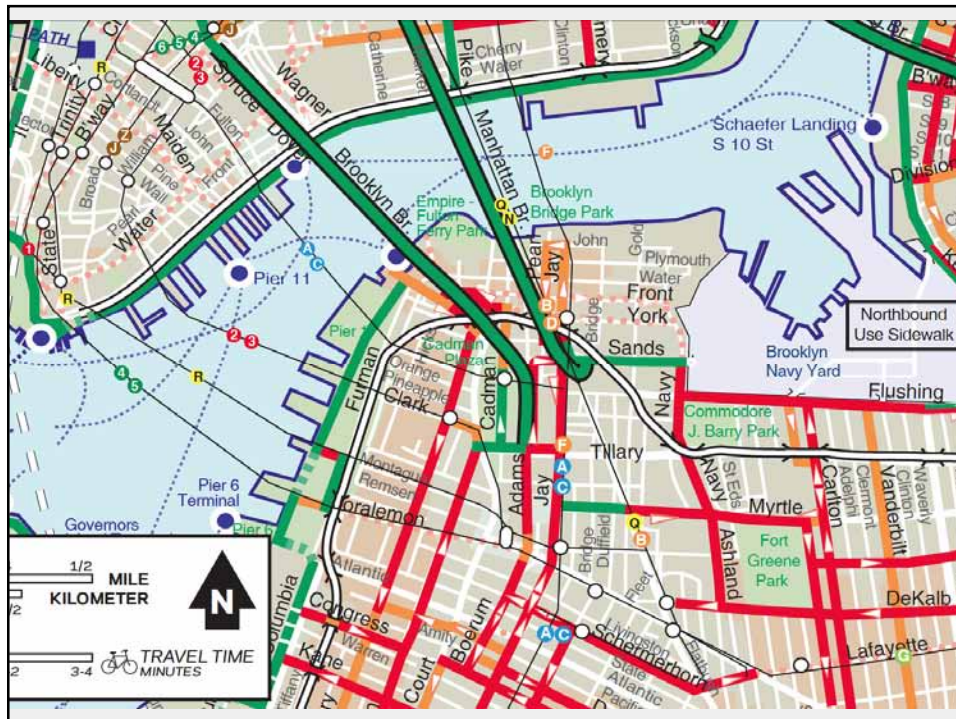
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Bicycle Circulation

NYC defines 3 types of bicycle paths

1. Protected bicycle path, protected separation from cars (green).
2. Bicycle lane, marked separate lane (red).
3. Bicycle route, shared lanes (gold).

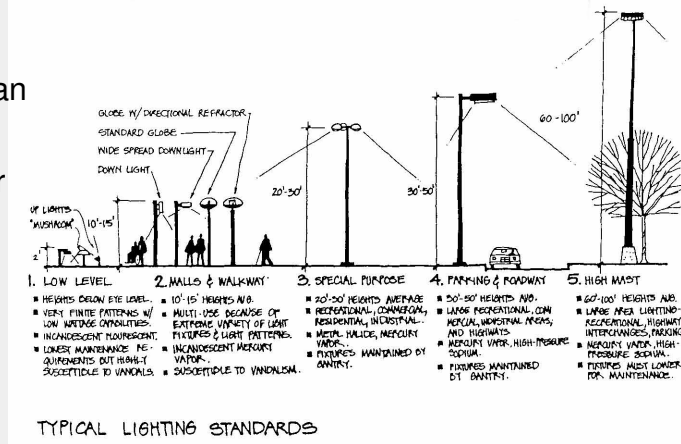
See map next slide



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Lighting

- 1. Pedestrian
- 2. Vehicular



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Low Pedestrian Lighting

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Purpose: to provide safety and security after dark
 Should occur at building entrances, at intersections, stairs, ramps, abrupt changes in grade, dead ends and remote walks
 pedestrian lighting varies from 1/2 to 5 foot-candles (building entrances, steps and intersections)
 LED, incandescent or mercury vapor

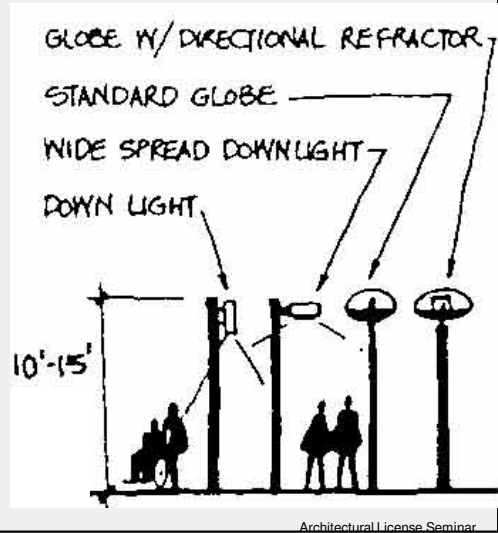


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Pedestrian Lighting Malls and Walkway

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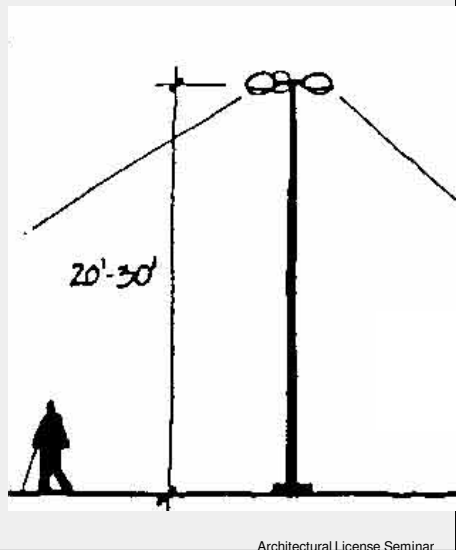
- 10-15' light
- Multi use because of extreme variety of light fixtures
- Incandescent and Mercury Vapor
- Susceptible to vandalism



Special Purpose Lighting

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- 20'-30' height average
- Recreational, commercial, residential, industrial
- Metal halide, mercury vapor



Vehicular Lighting

For drivers OK to use mercury vapor, metal halide and high-pressure sodium; poor color rendition but economical

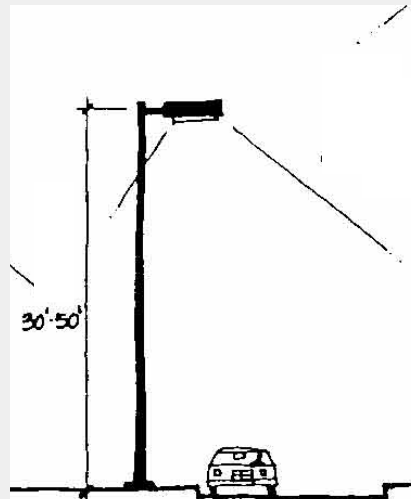
Street light 30-50 foot high, spaced 150-250' apart (1/2 foot candle at local roads and parking areas)



urban75.org

Vehicular Lighting Parking and Roadway

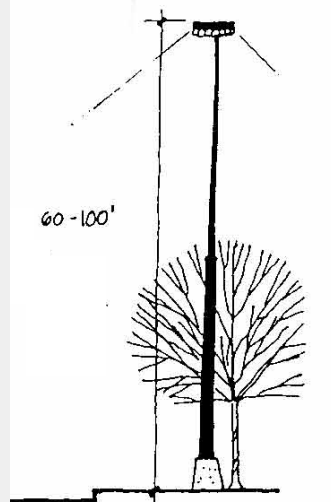
- 30'-50' height average
- Large area lighting- recreational, commercial, highway, industrial
- Mercury vapor, high pressure sodium



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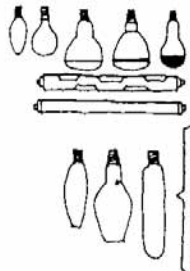
Vehicular Lighting High Mast

- 60'-100' height average
- Large area lighting-recreational, highway, interchanges, parking
- Mercury vapor, high pressure sodium



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Lamp Types and Characteristics



LAMP TYPE	WATTAGE RANGE	EFFICIENCY (lumens/watt)	LIFE (hours)	COLORS STRENGTHENED	COLORS DIMINISHED	REMARKS
INCANDESCENT	15-1000	LOW	750-2000	YELLOW, RED, ORANGE	BLUE	GOOD COLOR RENDITION
DELUXE COOL WHITE FLUORESCENT	15-215	MEDIUM	7,500-15000	ALL	NONE	BEST OVERALL COLOR RENDITION
DELUXE WHITE MERCURY VAPOR	90-1000	MEDIUM	10,000-24,000	BLUE, RED, YELLOW	GREEN	GOOD COLOR RENDITION
METAL HALIDE	175-1000	HIGH	7,500-10,500	YELLOW, BLUE, GREEN	RED	GOOD COLOR RENDITION
HIGH INTENSITY DISCHARGE HIGH PRESSURE SODIUM	250-1000	HIGH	10,000-15,000	YELLOW, GREEN, ORANGE	RED, BLUE	POOR COLOR RENDITION

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Light Pollution



Cut-off luminaires are now required in many municipalities to reduce night sky light trespass and pollution

Signage

Four principal functions

1. *to regulate or control* -STOP, emergency exit, no parking. Most common; involve health & safety
2. *to give directions* - IN, OUT, To parking. Accompanied by directional graphics arrows
3. *to provide information* - You are here large scale maps of universities orientating
4. *to give identification* Voorhees, Faculty parking



innerface-signage.com