

Circulation and Parking in the Campus Environment



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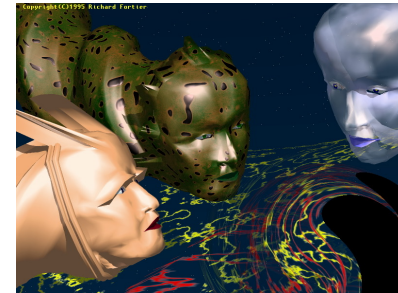
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Today's Discussion

**Basic Principles in
Campus Circulation
and Parking Systems**

**Discuss Various
Planning
Considerations for
each System**

**Trends and Future
Considerations**



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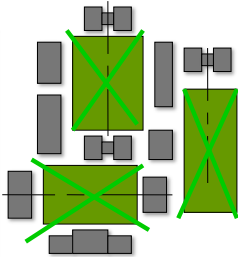



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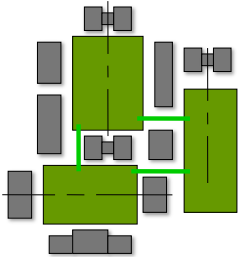

Open Space/Pedestrian Concepts



Quadrangles

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Open Space/Pedestrian Concepts




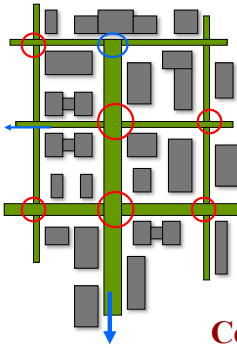
Yards/Quads

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Open Space/Pedestrian Concepts

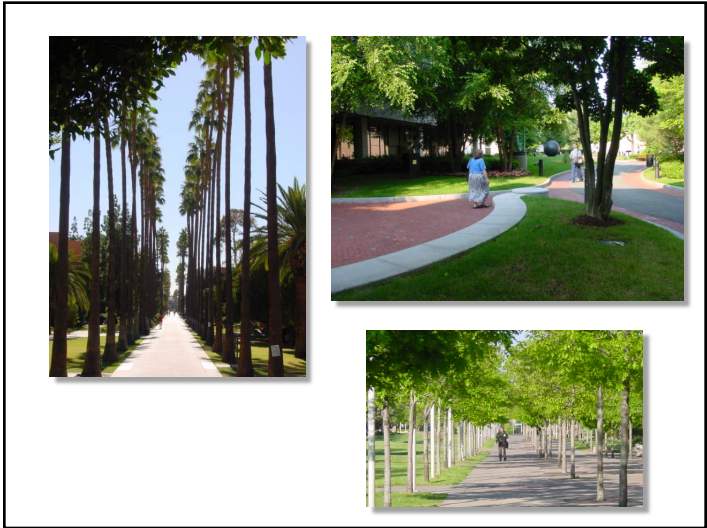


Corridors

8



9



10




11



12



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Campus Edges

Link to Community
Identity/Image
Gateways
Access Points
Varying Circulation
Systems
Informal/Formal

14



15



16



17



18

1.38 MPH

2.5-3.0 FPS

2.5-3.0 FPS (1.875 MPH)

vs 4-5 FPS (3.05 MPH)

\$3000 PLF

VS

\$75 PLF

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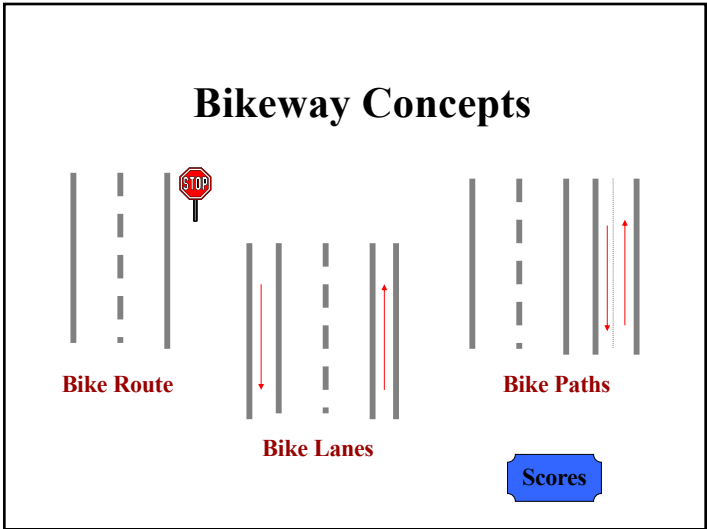
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Bikeways

- Types of Routes
 - Paths
 - Lanes
 - Routes
- Dismount Zones
- Connectivity w/ Community
 - Signage
 - Rules and Regulations





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Bikeway Parking

- Parking
 - Racks
 - Lockers
 - Locations
 - In Buildings




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Bicycle Rack Costs

\$25-\$100 per Bike

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Bicycle Locker Costs

\$400-\$750 per Bike

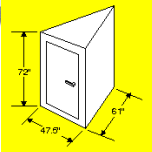
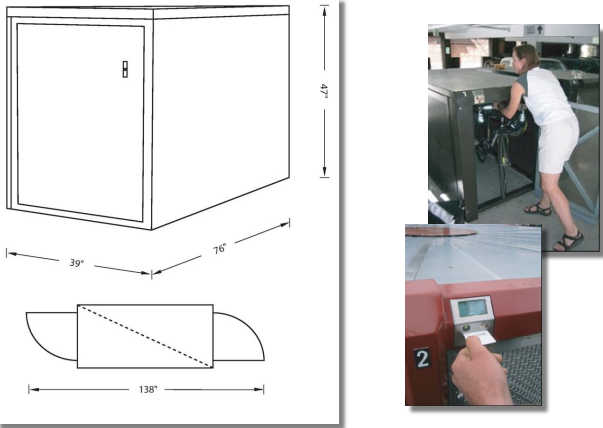


Diagram	Dimensions
	CIRCLE (10' 0" H. Diameter)
	OUTSIDE 90° CORNER
	HALF CIRCLE (10' 0" H. X 5' 0" W)
	INSIDE 90° CORNER
	STRADDLE LINE (5' 0" H. X 4' 0" W for each unit)

26



47"
39"
76"
138"

27



Revenue/Rentals

\$75-\$125 per Year



28



**Number of bike
spaces in one car
space: 10-12**

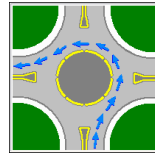
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**These Numbers Represent
Options to Place This**



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- Bike Registrations
- Enforcement
- Dismount Zones
- Bicycles in Buildings
- Repair Shops
- Other Services



FACTS
**500,000-750,000 bikes
stolen per year**
**53% chance on
Campus**

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KU Ban



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- More than half of all Americans live less than five miles from where they work according to Bicycling magazine.
- Only 1.67% of Americans commute by bicycle.
- In Japan, 15% commute by bicycle
- About 12 bicycles can be parked in the space required for one automobile.
- Traffic jams in the 29 major cities cost commuters an estimated \$24.3 billion each year.
- There are approximately 139 million automobiles in the United States.
- The number of bicycles in the U.S. is estimated to be about 103 million.
- One hundred bicycles can be produced for the same energy and resources it takes to build one medium-sized automobile.
- The average cost of a new car in the U.S. is \$13,532.
- The average cost of a new bicycle in the U.S. is \$385.
- The average number of barrels of oil consumed daily in the United States is 17 million.
- Driving consumes 43% of those barrels of oil.
- Industrial world cities typically use at least one third of their land for roads and parking lots for motor vehicles.
- Commuting by bicycle produces zero pollution.
- On average, the commute to work accounts for only one out of five auto trips taken by drivers each day.
- The number of bicycle commuters doubled between 1983 and 1990, according to the Bicycle Institute of America.
- In China, bicycles outnumber cars 250 to 1.

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Circulation

Vehicular

Public

Service

Commercial

Mass Transit

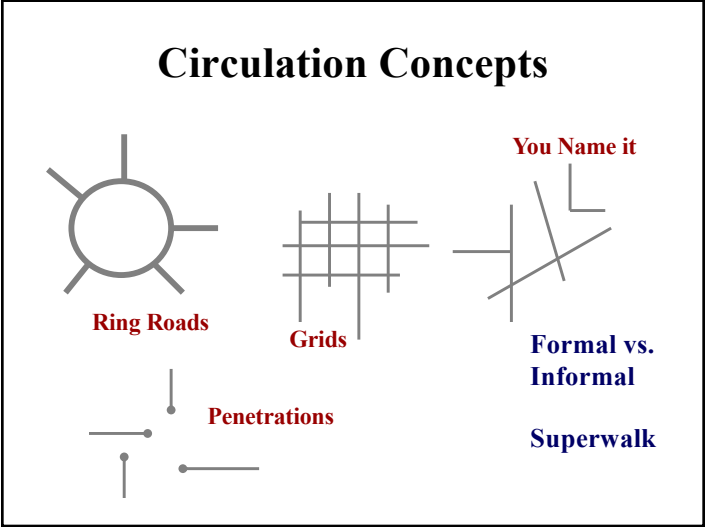
Bus

Train/Light

Rails/Sub

Shuttles

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Mass Transit

Increase Interactivity

Reduces Pollution

Pedestrian Orientation

Less Parking and Hard Surface

Less Expensive

Partnerships and Access to Community

Campus Scheduling

Bus

Rail

Light Rail

Commuter Track

Car Pooling

Ferry

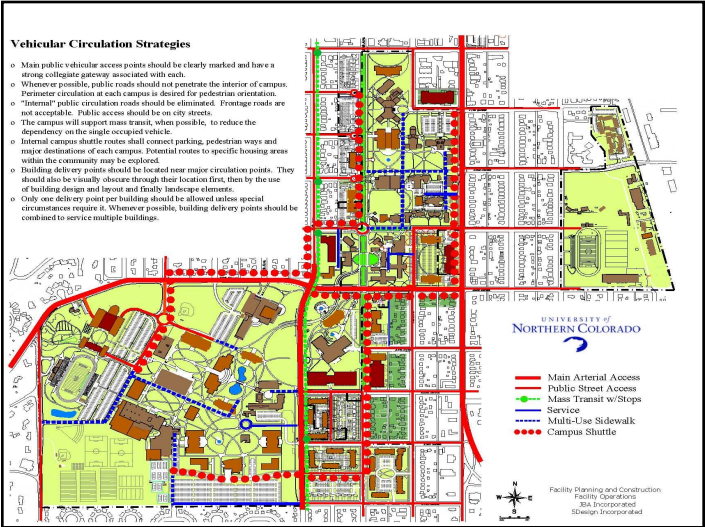
Shuttles

Off Campus

Internal

Other

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Service



Trash
Emergency Vehicles
Internal Deliveries
External Deliveries
Recycle
Operations and Management
Security
Renovations and Construction

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Strategies



Separation
Integration
Super-sidewalks
Scheduling
Screening
Alternative Modes for Internal Needs

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Accessibility



Mobility Impaired

Dimensions

Audio Impaired

Visually Impaired

Sensory Clues

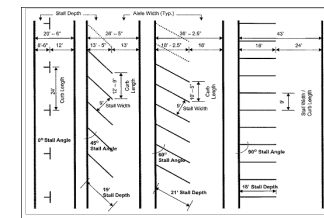
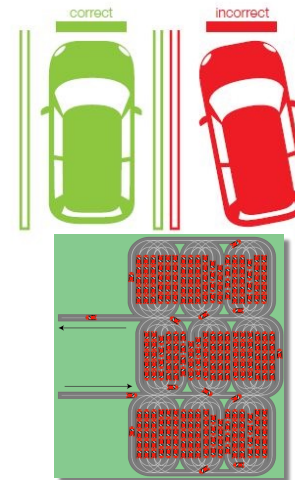
Other Issues

Relationship to the Americans with Disabilities Act (ADA)

Universal Accessibility



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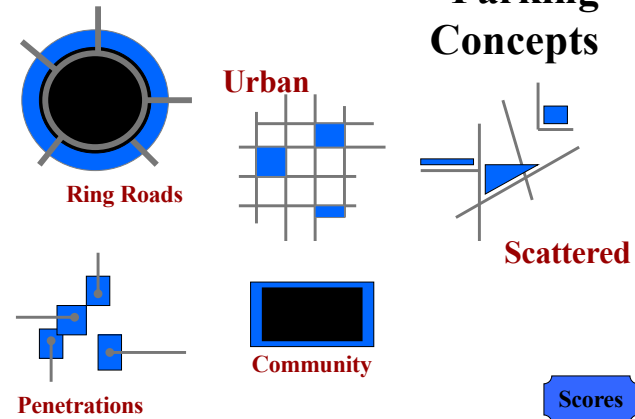
Parking

Faculty, Staff,
Students
Public
Mobility Impaired
Service Vehicles
Commercial
Vehicles
Bicycles
Mass Transit



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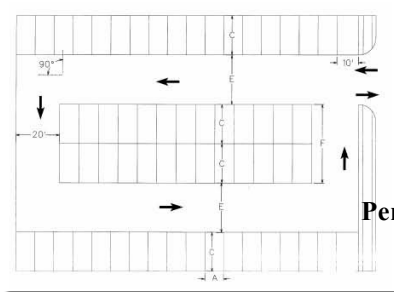
Parking Concepts



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STANDARD-SIZE CAR REQUIREMENTS STANDARD AASHTO

Degree of Angle	Stall Width	Curb Length	Stall Depth	Stall Length	Aisle Width 1-Way/2-Way E	Island Width
0	8.5'	23'	--	--	13'/24'	--
45	9'	12.7'	19.8'	19'	13'/13'	33.2'
60	9'	10.4'	21'	19'	18'/18'	37.4'
90	9'	9'	18'	18'	24'/24'	36'

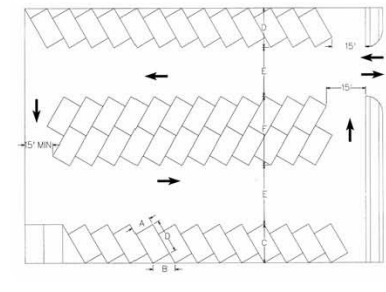


Perpendicular
Parking

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STANDARD-SIZE CAR REQUIREMENTS STANDARD AASHTO

Degree of Angle	Stall Width	Curb Length	Stall Depth	Stall Length	Aisle Width 1-Way/2-Way E	Island Width
0	8.5'	23'	--	--	13'/24'	--
45	9'	12.7'	19.8'	19'	13'/13'	33.2'
60	9'	10.4'	21'	19'	18'/18'	37.4'
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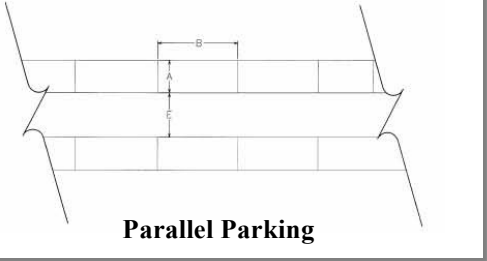


Angled
Parking

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STANDARD-SIZE CAR REQUIREMENTS STANDARD AASHTO

Degree of Angle	Stall Width A	Curb Length B	Stall Depth C	Stall Length D	Aisle Width 1-Way/2-Way E	Island Width F
0	8.5'	23'	--	--	13'/24'	--
45	9'	12.7'	19.8'	19'	13'/13'	33.2'
60	9'	10.4'	21'	19'	18'/18'	37.4'
90	9'	9'	18'	18'	24'/24'	36'



Parallel Parking

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Surface Parking Space Planning

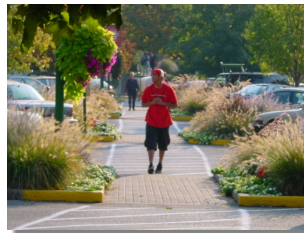
- Spaces are typically 9' x 19'
- 20' minimum pathways
- Perpendicular parking is usually most efficient
- Approximately 350 SF per space on average



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- **Capital Costs**
 - \$2000 - \$3500 per space
- **Maintenance**
 - \$75-\$125 per space per year in cold weather
 - Add \$100 attended
- **Replacement Cycle**
 - 15 years resurface
 - 30 years replacement
- **Loss to building sites**
- **Water detention issues**
- **Security**

Costs



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Parking Structure Space Planning

- Additional Space for Circulation
- Stacking Important
- Approximately 375 SF per space on Average
- Multipurpose Uses



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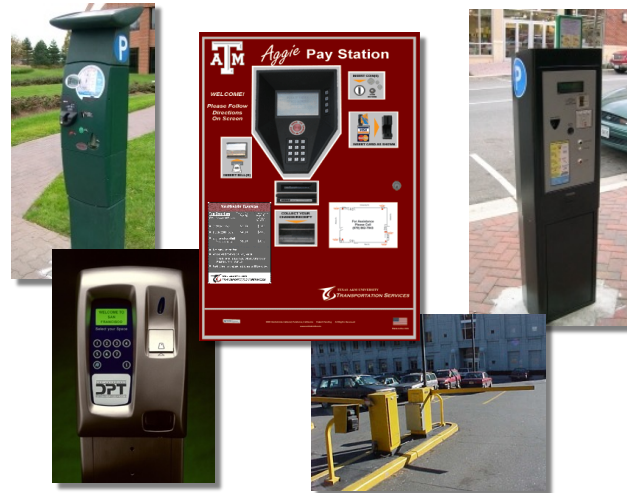
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Costs



- Capital Costs
 - \$13,000 - \$20,000 per space
- Maintenance
 - \$200-\$300 unattended
 - \$350-\$750 attended
- Replacement Cycle
 - 40 - 60 years
- Building Integration and Architecture
- Services and Utility Systems
- Security

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Control Issues

- Pay on Exit
- Pay on Entry
- Capacities
 - % of Occupancy
 - Turn Over
- Cash Business
- Turn Arounds
- Man Power



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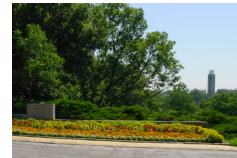


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Wayfinding Concepts



Regional Scale



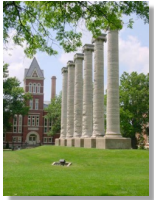
Vistas




Walks

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Wayfinding Concepts




Campus Identity



**Art/
Focal Points**



Signage



Architecture

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Signage

- Integration with Community
- Balance with Wayfinding Techniques
- Princeton Experience
- Reduce Visual Pollution
- Reusable Techniques
- Consistent Campus Theme
- Good Graphics, Less Verbiage



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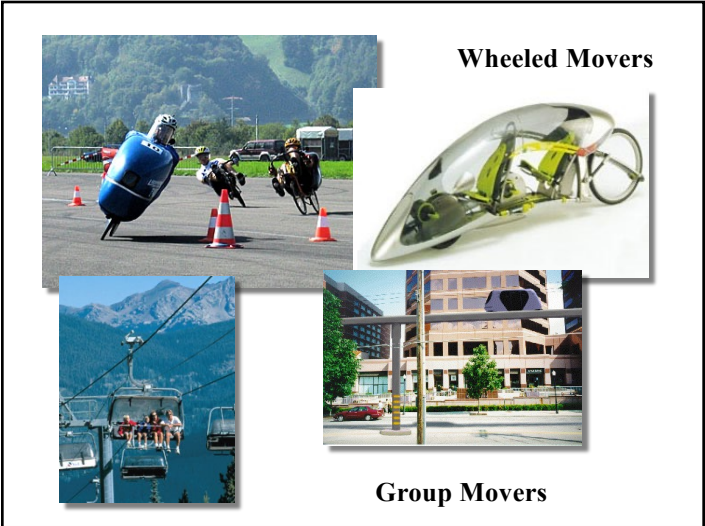

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Students of the Future



**Knowledge
Management
Digital Exploration
Power of Multimedia
No More Walls
No Patience
Interactive
Demanding
Choices/Learning
Styles
Students vs Faculty**