NEW YORK STATE OF OPPORTUNITY. | Department of State

Walkable Communities

Planning for Pedestrians

A Division of New York Department of State

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Why plan for pedestrians?

- Benefits: environmental, health, and economic
- Walkable communities characteristics
- Building and rediscovering walkable communities

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2013 National Assoc. of Realtors Survey

76% want single-family detached houses:

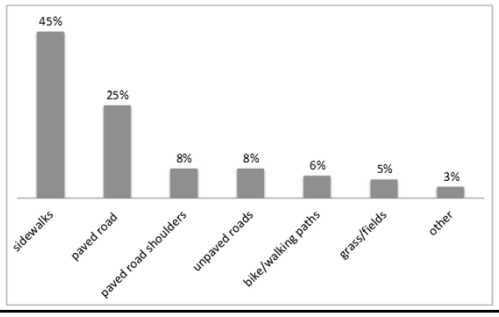
52% (suburban) large yard, indicating:
- Drive to amenities
- Ample parking
- Low or no access to public transit
- Long commute

24% (urban) small yard, indicating:
- Walk to amenities
- Some parking
- Access to public transit
- Short commute

Survey generational differences

Under Age 40	Over Age 50
• **high priority on transit alternatives** (walking, biking, and public transit) • **high priority revitalizing cities**	• **64% agreed with this statement:** • **"Car is king; nothing will replace my car as my main mode of transportation"**

Walking facilities



Facility barriers

- High speed or heavy traffic
- No sidewalks
- Narrow walkways
- Surfaces poorly constructed or maintained
- Physical features (rivers, RR tracks, major arterials lacking crossings)

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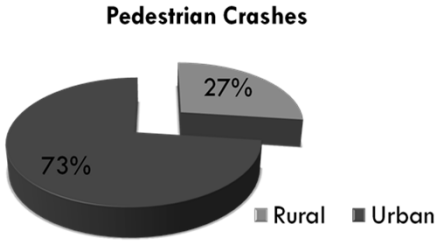
Rural vs. urban crashes



There are more crashes in urban areas, but more fatalities in rural areas.

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Measuring your walkability

- Walkability audits
- **RateMyStreet:** uses Google Maps to score based on disability access, crime, safety, sidewalks, etc.
- **Walk Score:** scores address based upon proximity to amenities, but does not include sidewalks, safety or topography

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Walkable Community characteristics

- Intact centers
- Residential densities, mixed income, mixed use
- Public space
- Universal design
- Speed controlled key streets
- Well linked streets & trails
- Properly scaled design
- Many people walking

Intact centers

Have centrally located:

- Variety of stores and businesses (open 8+ hours daily)
- Library (open 10+ hours daily)
- Post office, civic buildings
- Youth and senior services

And avoid:

- Strip malls and leap frog development
- Office parks
- Public facilities outside municipal centers
- Isolated schools

Mixed uses and density near center

- Variety of building types and affordability
- Higher densities

Public space

- Lively places for gathering, playing, and associating like parks and plazas
- Easily accessed by all, within 1/8 mile (700') of all homes

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Americans with Disabilities Act

- Chapter 11, 2010 Building Code of NYS: Accessibility
- Requires pedestrian facilities be planned, designed, constructed, and maintained to accommodate people with disabilities
- Applies to new construction and reconstruction (i.e., barrier removals)
- **About 70% of Americans will be temporarily or permanently disabled at some point in life**

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Well linked streets & trails

- Streets are block form, grid or other highly connected patterns
- Avoid cul-de-sac or other fractured patterns (or repair using trail connectors)
- Update official map and zoning to discourage long, disconnected streets

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Properly scaled design

Homes within 2 mile walking radius of most services:

- Elementary school: within 3 miles
- High school: within 1 mile
- Parks: within ⅛ mile
- Bus tops within ¼ to ½ mile

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Where are the cars?

Street design
Traffic calming
Parking standards

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Complete Streets law

Complete Streets design principles:

- bicycle lanes,
- crosswalks,
- pedestrian control signalization,
- bus pull outs,
- curb cuts,
- raised crosswalks,
- ramps, and
- sidewalks,
- traffic calming measures

Public projects with federal and state funding subject to DOT oversight must consider Compete Streets design principles

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Speed controlled streets

- Municipalities can design their streets for safety
- Speeds set for safe, courteous travel
- Wider streets: accidents per mile per year increase
- Safest streets: narrow, slow, 24' wide streets
- Most dangerous streets: 36' wide streets (typical of conventional subdivisions)
- Avoid one way streets to hasten exits to suburbs

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Pedestrian friendly street design

- Narrow streets: less conducive to higher speeds
- Lighting on shorter poles or lower fixtures
- Planting buffers with landscaping and trees provide shelter and shade without obstructing sight
- Street furniture: benches, drinking fountains
- Public art, banners, paving, cultural and historic elements to promote “sense of place”
- Signs and signals for both pedestrians and motorists

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Traffic calming

Volume control

- Full closures
- Half closures
- Median barriers

Speed control

- Roundabouts
- Chicanes
- Center island narrowings
- Speed humps, raised crosswalks

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Parking standards

- Decrease minimum parking standards
- Bicycle parking
- Valet parking
- Permeable parking lot surfaces

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Design principles

Sidewalks
Shoulders
Intersections
Safe Routes to Schools
Trails

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Problem sidewalks

Recommended sidewalk widths

- Central business district (CBD):
  - 8' minimum
- Commercial/industrial outside CBD:
  - 5' minimum with 2' planting strip or 7' without planting strip
  - 4' or 5' wide planting strip when possible
- Residential outside CBD:
  - 5' on arterial/collector streets with 2' planting strip
  - 5' on local streets with 2' planting strip in R1 zones

Sidewalk setback/planting strip

- Space for utility and lighting poles, signs, fire hydrants, parking meters, etc.
- Allows for alignment of sidewalks with curb ramps and crosswalks at intersections
- Space for landscaping
- Space for seasonal leaf and snow storage

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Trails and greenways

Widths:
- 10' for two-way multi-use path

Clearance:
- 3' on each side; 5' buffer on roadside
- 8' minimum overhead

Surface:
- asphaltic concrete for most uses
- Portland cement for pedestrians (not bikes or skaters)

Maintenance:
- Routine work ensures user safety; prolongs facility life
- Good signage:
- Warning, directional, and informational

Safety:
- Proximate homes & businesses increase visibility & security
- Multi-use paths should accommodate maintenance & emergency vehicles
- Routine maintenance is crucial

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Intersections and crosswalks

- Short wait
- Adequate crossing time
- Appropriate intervals
- Clear space
- Visibility
- Legibility
- Accessibility
- Separation from traffic

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School site selection

- Establish school as strong center of community
- Low traffic locations within neighborhoods best
- Trails/pathways for direct links to neighborhoods
- Sidewalks streets leading to school
- Minimize parking to encourage walking or biking
- Use traffic calming
- Well designed, frequent intersections and crossings:
  - Good visibility, lighting, trees for shade and shelter

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Safe Routes To School (SRTS)

- Federal, state, local effort
- Goal: develop and implement projects that encourage walking and biking to school
- Four pronged approach:
  - engineering,
  - enforcement,
  - education, and
  - encouragement

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What municipal officials can do

- Comprehensive Plan
- Zoning and Land Regulations
- Consider walking and non-auto transportation in review

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Comprehensive plan

- Include clear policy statements on pedestrian needs
- Encourage mixed uses, higher density with pedestrian access
- Emphasize pedestrian oriented neighborhoods/community centers over automobile ones
- Highlight street design standards to promote pedestrians safety
- Use grid pattern roads to slow and to disburse traffic
- Require pedestrian facilities with all new development

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Residential area zoning

Encourage

- Variety of housing and density
- Small-scale shops, schools, and offices near residential areas
- Narrow, grid pattern streets with alleys
- Sidewalks/walkways on both sides of streets

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Residential area zoning

Discourage

- Gated or walled subdivisions
- Auto-oriented uses like drive-throughs
- Excessive parking requirements
- Cul-de-sacs, dead ends
- Front of lot garages
- Large retail outlets
- Large parking lots

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Commercial area zoning

Encourage

- Office/retail mix; housing on upper floors
- Projects close to transit stops
- Awnings and overhangs
- Public spaces as part of projects
- Bicycle parking at front entrances
- Regularly spaced trees/benches
- Large parking lots cut into 300' blocks with curbs, sidewalks, trees

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Commercial area zoning

Discourage

- Building less than 2 stories high
- Subdivision for single family homes
- Buildings with side or rear entrances
- Front of lot parking and garages
- Perimeter walls around projects
- Cul-de-sacs and dead ends
- Minimum parking standards
- Wide streets

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Office/industrial zoning

Encourage

- Core of retail and commercial services
- Any large parking lots have curbs, sidewalks, and trees
- Bike parking at front entrances
- Park-and-ride lots and transit centers

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PUD/TND zoning

Encourage

- Central community center with park or square
- Retail/professional offices near community center
- All dwellings within 1000' of park or greenway

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TOD zoning

Encourage

- Sidewalks on both sides of streets
- Walkways between schools, homes, transit stations
- Front entrances no more than 10' from sidewalks
- Mixed use development; first floor retail/services
- On street parking, within or under buildings
- Regularly spaced trees, benches

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Transit zone zoning

Discourage:

- Auto-uses and excessive curb cuts
- Superstores exceeding 50,000 sf
- Buildings less than 2 stories high
- Residential development with 1+ off street parking space per unit
- Office development with 1+ parking space per 600 sf of building floor area
- Dead ends, cul de sacs, walled perimeters

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Site Plan Review

- Designate review board, enforcement
- Submission requirements
- Review elements

- Build to street with parking in back
- Connected parking lots with pedestrian zones
- Pedestrian amenities (benches, trees, landscaping)
- Good lighting, clear sight lines
- ADA compliant sidewalks, ramps

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Site Plan Review

- Review elements include pedestrian design
- Review board: Oversee approval of designs consistent with plans and regulations

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What can municipal officials do?

- Install sidewalks as part of capital projects, and/or automatic with any new development
- Adopt sidewalk construction standards
- Provide incentives for architectural design protecting pedestrians from the weather (canopies or arcades)
- Construct walkways within 1.5 miles of schools
- Incorporate policies to promote walkability in comprehensive plans
- Modify zoning, including reducing minimum parking

Contact the Department of State

(518) 473-3355	Training Unit
(518) 474-6740	Legal Department
(800) 367-8488	Toll Free

Email: localgov@dos.ny.gov
Website: www.dos.ny.gov
http://www.dos.ny.gov/lg/lut/index.html

Walkability Checklist

How walkable is your community?

Take a walk with a child and decide for yourselves.

Everyone benefits from walking. These benefits include: improved fitness, cleaner air, reduced risks of certain health problems, and a greater sense of community. But walking needs to be safe and easy. Take a walk with your child and use this checklist to decide if your neighborhood is a friendly place to walk. Take heart if you find problems, there are ways you can make things better.

Getting started:

First, you'll need to pick a place to walk, like the route to school, a friend's house or just somewhere fun to go.

The second step involves the checklist. Read over the checklist before you go, and as you walk, note the locations of things you would like to change. At the end of your walk, give each question a rating. Then add up the numbers to see how you rated your walk overall.

After you've rated your walk and identified any problem areas, the next step is to figure out what you can do to improve your community's score. You'll find both immediate answers and long-term solutions under "Improving Your Community's Score..." on the third page.

Partnership for a Walkable America

Pedestrian and Bicycle Information Center

U.S. Department of Transportation

Take a walk and use this checklist to rate your neighborhood's walkability.

How walkable is your community?

Location of walk _____

_____

Rating Scale:

1	2	3	4	5	6
awful	many problems	some problems	good	very good	excellent

1. Did you have room to walk?

☐ Yes ☐ Some problems:

- ☐ Sidewalks or paths started and stopped
- ☐ Sidewalks were broken or cracked
- ☐ Sidewalks were blocked with poles, signs, shrubbery, dumpsters, etc.
- ☐ No sidewalks, paths, or shoulders
- ☐ Too much traffic
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

2. Was it easy to cross streets?

☐ Yes ☐ Some problems:

- ☐ Road was too wide
- ☐ Traffic signals made us wait too long or did not give us enough time to cross
- ☐ Needed striped crosswalks or traffic signals
- ☐ Parked cars blocked our view of traffic
- ☐ Trees or plants blocked our view of traffic
- ☐ Needed curb ramps or ramps needed repair
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

3. Did drivers behave well?

☐ Yes ☐ Some problems: Drivers...

- ☐ Backed out of driveways without looking
- ☐ Did not yield to people crossing the street
- ☐ Turned into people crossing the street
- ☐ Drove too fast
- ☐ Sped up to make it through traffic lights or drove through traffic lights?
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

4. Was it easy to follow safety rules? Could you and your child...

☐ Yes ☐ No Cross at crosswalks or where you could see and be seen by drivers?

☐ Yes ☐ No Stop and look left, right and then left again before crossing streets?

☐ Yes ☐ No Walk on sidewalks or shoulders facing traffic where there were no sidewalks?

☐ Yes ☐ No Cross with the light?

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

5. Was your walk pleasant?

☐ Yes ☐ Some unpleasant things:

- ☐ Needed more grass, flowers, or trees
- ☐ Scary dogs
- ☐ Scary people
- ☐ Not well lighted
- ☐ Dirty, lots of litter or trash
- ☐ Dirty air due to automobile exhaust
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one) _____

1 2 3 4 5 6 _____

How does your neighborhood stack up? Add up your ratings and decide.

1. _____
2. _____
3. _____
4. _____
5. _____

Total _____

26-30	Celebrate! You have a great neighborhood for walking.
21-25	Celebrate a little. Your neighborhood is pretty good.
16-20	Okay, but it needs work.
11-15	It needs lots of work. You deserve better than that.
5-10	It's a disaster for walking!

Now that you've identified the problems, go to the next page to find out how to fix them.

Now that you know the problems,
you can find the answers.

Improving your community's score...

	What you and your child can do immediately	What you and your community can do with more time
1. Did you have room to walk? Sidewalks or paths started and stopped Sidewalks broken or cracked Sidewalks blocked No sidewalks, paths or shoulders Too much traffic	• pick another route for now • tell local traffic engineering or public works department about specific problems and provide a copy of the checklist	• speak up at board meetings • write or petition city for walkways and gather neighborhood signatures • make media aware of problem • work with a local transportation engineer to develop a plan for a safe walking route
2. Was it easy to cross streets? Road too wide Traffic signals made us wait too long or did not give us enough time to cross Crosswalks/traffic signals needed View of traffic blocked by parked cars, trees, or plants Needed curb ramps or ramps needed repair	• pick another route for now • share problems and checklist with local traffic engineering or public works department • trim your trees or bushes that block the street and ask your neighbors to do the same • leave nice notes on problem cars asking owners not to park there	• push for crosswalks/signals/ parking changes/curb ramps at city meetings • report to traffic engineer where parked cars are safety hazards • report illegally parked cars to the police • request that the public works department trim trees or plants • make media aware of problem
3. Did drivers behave well? Backed without looking Did not yield Turned into walkers Drove too fast Sped up to make traffic lights or drove through red lights	• pick another route for now • set an example: slow down and be considerate of others • encourage your neighbors to do the same • report unsafe driving to the police	• petition for more enforcement • request protected turns • ask city planners and traffic engineers for traffic calming ideas • ask schools about getting crossing guards at key locations • organize a neighborhood speed watch program
4. Could you follow safety rules? Cross at crosswalks or where you could see and be seen Stop and look left, right, left before crossing Walk on sidewalks or shoulders facing traffic Cross with the light	• educate yourself and your child about safe walking • organize parents in your neighborhood to walk children to school	• encourage schools to teach walking safely • help schools start safe walking programs • encourage corporate support for flex schedules so parents can walk children to school
5. Was your walk pleasant? Needs grass, flowers, trees Scary dogs Scary people Not well lit Dirty, litter Lots of traffic	• point out areas to avoid to your child; agree on safe routes • ask neighbors to keep dogs leashed or fenced • report scary dogs to the animal control department • report scary people to the police • report lighting needs to the police or appropriate public works department • take a walk wih a trash bag • plant trees, flowers in your yard • select alternative route with less traffic	• request increased police enforcement • start a crime watch program in your neighborhood • organize a community clean-up day • sponsor a neighborhood beautification or tree-planting day • begin an adopt-a-street program • initiate support to provide routes with less traffic to schools in your community (reduced traffic during am and pm school commute times)
A Quick Health Check Could not go as far or as fast as we wanted Were tired, short of breath or had sore feet or muscles Was the sun really hot? Was it hot and hazy?	• start with short walks and work up to 30 minutes of walking most days • invite a friend or child along • walk along shaded routes where possible • use sunscreen of SPF 15 or higher, wear a hat and sunglasses • try not to walk during the hottest time of day	• get media to do a story about the health benefits of walking • call parks and recreation department about community walks • encourage corporate support for employee walking programs • plant shade trees along routes • have a sun safety seminar for kids • have kids learn about unhealthy ozone days and the Air Quality Index (AQI)

Need some guidance?
These resources might help...

Great Resources

WALKING INFORMATION

Pedestrian and Bicycle Information Center (PBIC)
UNC Highway Safety Research Center
730 Airport Road , Suite 300
Campus Box 3430
Chapel Hill, NC
27599-3430
Phone: (919) 962-2202
www.pedbikeinfo.org
www.walkinginfo.org

National Center for
Bicycling and Walking
Campaign to Make
America Walkable
1506 21st Street, NW
Suite 200
Washington, DC 20036
Phone: (800) 760-NBPC
www.bikefed.org

WALK TO SCHOOL DAY WEB SITES

USA event: www.walktoschool-usa.org
International: www.iwalktoschool.org

STREET DESIGN AND TRAFFIC CALMING

Federal Highway Administration
Pedestrian and Bicycle Safety Research Program
HSR - 20
6300 Georgetown Pike
McLean,VA 22101
www.fhwa.dot.gov/environment/bikeped/index.htm

Institute of Transportation Engineers
www.ite.org

Surface Transportation Policy Project
www.transact.org

Transportation for Livable Communities
www.tlcnetwork.org

WALKING COALITIONS

America Walks
P.O. Box 29103
Portland, Oregon 97210
Phone: (503) 222-1077
www.americawalks.org

Partnership for a Walkable America
National Safety Council
1121 Spring Lake Drive
Itasca, IL 60143-3201
Phone: (603) 285-1121
www.nsc.org/walkable.htm

PEDESTRIAN SAFETY

National Highway Traffic Safety Administration
Traffic Safety Programs
400 Seventh Street, SW
Washington, DC 20590
Phone: (202) 662-0600
www.nhtsa.dot.gov/people/injury/pedbimot/ped

National SAFE KIDS Campaign
1301 Pennsylvania Ave. NW
Suite 1000
Washington, DC 20004
Phone: (202) 662-0600
Fax: (202) 393-2072
www.safekids.org

WALKING AND HEALTH

US Environmental Protection Agency
Office of Children's Health Protection (MC 1107A)
Washington, DC 20460
Phone: 202-564-2188
Fax: 202-564-2733
www.epa.gov/children/
www.epa.gov/airnow/
www.epa.gov/air/urbanair/ozone/what.html
www.epa.gov/sunwise/uvindex.html
www.epa.gov/otaq/transp/comchoic/ccweb.htm

President's Task Force on Environmental Health Risks and
Safety Risks to Children
www.childrenshealth.gov

Centers for Disease Control and Prevention
Division of Nutrition and Physical Activity
Phone: (888) 232-4674
www.cdc.gov/nccdphp/dnpa/readyset
www.cdc.gov/nccdphp/dnpa/kidswalk/index.htm

Prevention Magazine
33 East Minor Street
Emmaus, PA 18098
www.itsallaboutprevention.com

Shape Up America!
6707 Democracy Boulevard
Suite 306
Bethesda, MD 20817
www.shapeup.org

ACCESSIBLE SIDEWALKS

US Access Board
1331 F Street, NW
Suite 1000
Washington, DC 20004-1111
Phone: (800) 872-2253;
(800) 993-2822 (TTY)
www.access-board.gov

WALKABLE COMMUNITIES

Plan for pedestrians as a top priority in all cities, villages, and town centers, creating a safe and attractive network of sidewalks and crossings within a 5 to 10 minute walk of the center.

One of the fundamental requirements of a successful center is making people feel comfortable walking around. Virtually everyone is a walker, if you include wheelchair users who also need good sidewalks. And walkers are shoppers. Except for banks and burger joints, people still have to get out of their cars to become customers. Attractive sidewalks are the economic lifeblood of centers, good for bottom-line business by enticing people to browse from store to store, rather than making only one quick stop.

A convenient sidewalk system insures a proper balance between walking and vehicles, helping to restore the street as a social space. Too often walkers are only considered obstructions to the flow of faster traffic, even though slower speeds are essential in centers. Over 80% of pedestrians are killed in 40 mph accidents, while only 15% die at 20 mph. One out every seven traffic fatalities are pedestrians (1 of 4 in New York State), so we need to put a much higher priority on safe sidewalks and crosswalks.

The First Steps to Walkability

Step 1- Take photos or videotape your streets
If the main sidewalks are not fairly full in the afternoons and friends are not stopping for long conversations on the corners, go to Step 2.

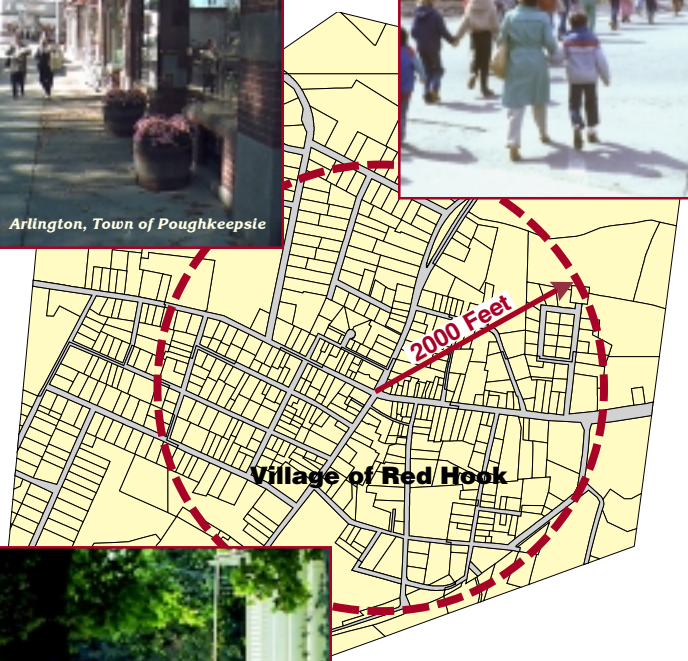
Step 2 - Observe and talk to seniors and kids
Over 30% of people cannot drive because of age, income, or disability. If a 12-year-old and her grandpa cannot easily walk from their homes to the center, find a nice place to sit, and some interesting things to do, go to Step 3.

Step 3 - Map all pedestrian features
Do an inventory of sidewalks, crosswalks, benches, bus stops, bike racks, and high pedestrian generators (post offices, schools, public parking, etc.). Also note obstacles to walking, such as 30+ mph or overly wide roads, lack of sidewalks and crosswalks, no buffer from traffic, gaps between storefronts, or stores behind parking lots.

Step 4 - Agree on a list of priority projects
Work with public officials, business owners, and other key groups to fill in the gaps to a continuous walking network, beginning with easier tasks like striping new crosswalks, mapping sidewalk extensions, and getting local boards to include pedestrian enhancements in every site plan.

Arlington, Town of Poughkeepsie

Arlington, Town of Poughkeepsie



Village of Fishkill

A compact mix of community uses and a continuous pedestrian network within a 1/4 mile to 2,000 foot radius of the neighborhood center encourages walking for short trips, to nearby schools, and between stores in the business area.

Pedestrian-Friendly Guidelines

Sidewalk Design:

- 5-foot minimum width (6-foot wide better); 8 to 15 feet in main street commercial areas.
- 7-foot minimum height clearance.
- Durable materials (concrete or brick pavers best).
- At least 5 feet (preferably 6 feet) back from curb to separate walkers from traffic and road spray, allow room for street trees and snow storage, and prevent side slopes at each driveway.
- Meet Americans with Disabilities Act requirements.

Sidewalk Locations:

- Both sides along central circulation streets, in commercial districts, near schools, and in residential areas with more than 4 units per acre.
- At least on one side in residential areas with 1 to 4 units per acre.
- Optional one side or wide shoulder in areas with less than 1 unit per acre.

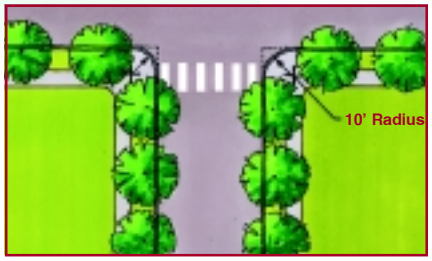
Crosswalks:

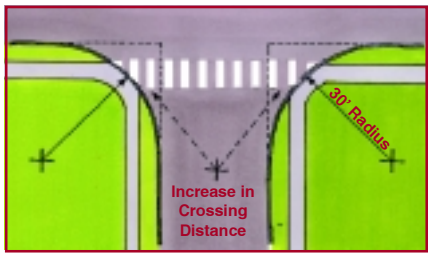
- As short as possible with small corner radii.
- About 10 feet wide, well lit, boldly marked with bar stripes or textured surface, and at every major intersection and selected higher volume mid-block crossings.
- Extend curbs/sidewalks into parking lanes to shorten crosswalks and increase visibility.

Traffic:

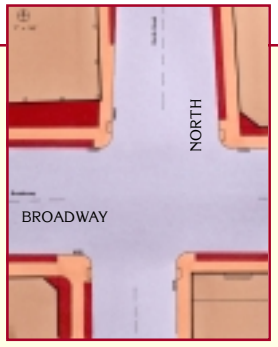
- Slow speeds to under 30 mph in centers, preferably under 20 mph in higher pedestrian areas.
- Provide pedestrian signals and eliminate right turn on red at major crossing locations.

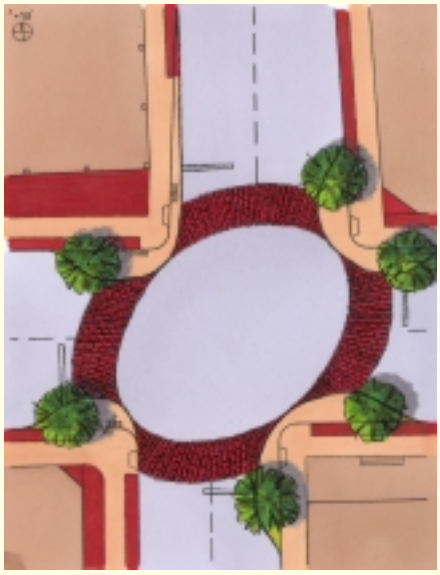
New York drivers need to be reminded that walkers have rights too. Additional crosswalks with bold markings will help announce equal access for walkers and cars in centers.





Corner radii in centers should be as small as possible to shorten crosswalks and slow down turning vehicles. Where a traditional 5 to 10-foot radius produces a 36-foot crossing distance, a new 30-foot radius can create a 60-foot crosswalk.





A redesign for the "four corners" intersection in Tivoli calls for textured brick crosswalks, street trees, and flared sidewalks out into the parking lanes to slow traffic, increase pedestrian visibility, and prevent illegal parking too close to the intersection.

Pedestrians are the lost measure of a community... To plan as if there were pedestrians may be a self-fulfilling act.

Peter Calthorpe

Sources:
Anton Nelessen, *Visions for a New American Dream*, 1993
Peter Calthorpe, *The Next American Metropolis, Ecology, Community, and the American Dream*, 1993

Plan On It

A Dutchess County Planning Federation eNewsletter

DUTCHESS COUNTY PLANNING FEDERATION

March/April 2015

Getting to the Root of the Issue:

Ensuring Sidewalks and Street Trees Can Successfully Coexist

By Emily Dozier, AICP, Senior Planner

We planners love street trees — they can transform a wide, hot road into a narrower, cooler and more pleasant place, and dramatically enhance the quality of a main street. However, street trees and sidewalks can make life difficult for one another, and these conflicts make some communities hesitant to install one or the other — sidewalks out of fear that existing trees will not survive, or street trees to avoid the maintenance issues caused by tree roots. But given that communities in Dutchess County and around the world have beautiful, tree-lined sidewalks, we know it is possible to have both.

So, how can street trees and sidewalks get along?

Understanding Street Tree Basics

Tree roots grow under sidewalks when there is sufficient oxygen, water, and space. However, soil beneath sidewalks is often highly compacted. When roots encounter dense soil or pavement, they change direction, stop growing, or adapt by remaining close to the surface. This can make them susceptible to drought and can also cause the sidewalk to lift. Dense soils can also cause tree roots to rot if the soil is waterlogged.

An example of lifted sidewalk pavers due to interference from tree roots.

Trees need adequate pervious space for their roots to grow. If possible, plant trees in a landscaped buffer adjacent to the street. Tree wells or trenches with groundcover, permeable pavers, or another surface that allows water to infiltrate can also be used. Make sure there is sufficient soil volume for the tree's ultimate size. If you have limited space, try to connect areas under the sidewalk so air, water and roots can move below the surface. In areas with heavy pedestrian traffic, tree grates, guards, or covered trenches can be used.

This groundcover and grass planting strip allows water to infiltrate down to the tree's roots.

When selecting a tree variety, keep in mind that street trees should be hardy, salt-resistant, deep-rooted, and not drop fruits or seed pods. If you are adding new trees to a row of existing street trees, select a variety that has similar watering requirements. At the same time, keep in mind that a diversity of species can help resist disease. To maximize

the benefits of street trees, select ones that can achieve a height and spread of 50 feet for residential streets and 40 feet for commercial streets within ten years. Work with a landscape professional to select the most appropriate trees for the specific location.

This tree well in the parking lane calms traffic and protects the crosswalk. Photo credit: FHWA.

We recommend placing street trees between the curb and sidewalk. Trees near the curb are much more effective at visually narrowing the street, calming traffic, creating a canopy to shade the sidewalk and street, and buffering traffic for pedestrians. If that's not possible and you have on-street parking, consider placing tree wells in the street between parking spaces. These can be integrated into curb extensions, which calm traffic and shorten crosswalks. Finally, you could plant trees on the inside of the sidewalk, but this may require the property owner's agreement and cooperation. We recommend spacing trees 20 to 30 feet apart in town centers, villages and cities with slow speed limits (30 mph or less), and 30 to 40 feet apart in higher-speed areas.

Measures to Prevent Tree-Sidewalk Conflicts

When installing new sidewalks or street trees, these measures can help ensure a successful tree-sidewalk relationship:

Gravel sub-base is a layer of washed gravel or other free-draining material under the sidewalk can help prevent roots from growing up and lifting the sidewalk. Alternatively, in well-drained soil, foam insulation boards beneath the concrete may also be used.

Structural soil is an engineered mix of crushed gravel and soil that provides both space for tree roots and sufficient support for overlying pavement. It is useful where compacted soil is required, such as under sidewalks.

Case study: Town of Hyde Park, Route 9 and Market Street

In 1999, the Town of Hyde Park's Shade Tree Commission installed street trees along Route 9 and Market Street using structural soil—the first such project in the region. They dug 5 foot wide by 3 foot deep trenches under the entire length of the sidewalks and filled them with structural soil to increase the roots' access to air and water. Pervious brick pavers were installed along the sidewalk to allow water to filter into the soil. Utility wires were relocated underground to avoid conflicts with the trees and increase the attractiveness of the area. In the 15 years since they were planted, the trees have continued to thrive and make the historic crossroads area of Hyde Park more attractive.

Photo credit: Google street view

Root barriers are plastic panels that can be installed in the soil along a sidewalk or around a tree to guide roots downward and away from sidewalks. They can be used for existing or new trees, but work best in well-drained soil.

Unlike bluestone and asphalt, which are prone to lifting and cracking, ***flexible or porous pavement*** can be used on sidewalks or in tree wells to reduce maintenance. While it won't prevent roots from lifting sidewalks, it can accommodate some lifting while still maintaining a relatively smooth, firm walking surface.

Rubberized sidewalk pavers. Photo credit: FHWA.

Keep Maintenance in Mind

Try to plant trees in the fall to minimize watering needs. Develop a maintenance agreement that specifies who is responsible for regular inspections, watering, pruning and other maintenance. Choosing native trees from local nurseries will minimize maintenance requirements. Using native soil when planting can also help the tree adapt to local conditions. If your community is faced with tree-sidewalk conflicts, here are some techniques to correct the problem:

- **Shave sidewalks**: If a sidewalk is lifted, the top can be shaved to even out the surface and reduce tripping hazards.
- **Install a wedge**: Another option if a sidewalk is lifted is to install a wedge of asphalt or concrete to bring the lower level up to the lifted edge.
- **Re-route the sidewalk**: Sidewalks that are being lifted due to tree roots can be re-installed further from the tree trunk. You may need permission from the adjacent property owner to re-route the sidewalk.
- **Ramp the pavement**: Sidewalks can be ramped or 'bridged' over tree roots. This involves more construction than shaving or installing a wedge. The ramped sidewalk must still meet the ADA maximum slope of 5%.

Case study: Village of Millbrook Sidewalk Improvement Plan

The Village of Millbrook shaves sidewalks to remove tripping hazards as part of its annual sidewalk improvement plan. The Village has found shaving to be much more cost effective than replacing sidewalk sections, and more effective at reducing trip hazards and preserving the pavement than sidewalk grinding. The cost is programmed into the Village budget each year. By taking responsibility for the condition of sidewalks, the Village ensures that its sidewalks are maintained consistently and in a timely manner.

A sidewalk in the Village of Millbrook that has been shaved to even out the surface where lifting occurred.

- **Use paver blocks**: Paver blocks or rubber pavers can be used to replace paved sidewalks in areas with root damage. Such pavers do not prevent lifting, but allow for a smoother transition if lifted and can be more easily replaced if needed.

- **Shave roots**: If other solutions are not feasible, tree roots can be shaved and new concrete installed. However, it is best not to cut large roots (more than 2 inches in diameter), to limit shaving to one-third of the root's diameter, and to not shave roots that are closer than three times the trunk diameter from the tree's base. Rigid foam can be installed between the shaved root and the concrete to prevent a root callus from lifting the new pavement.

This sidewalk was routed around the street tree.

- **Remove roots**: As a last resort, roots at the edge of a sidewalk can be removed and the sidewalk replaced. Root removal can endanger the tree's stability, so enlist the help of a professional before removing roots.

Did You Know?

Street trees provide many benefits to a community, including:

Property Values: Large trees can increase commercial and residential property values by up to 10 percent.[1]

Retail sales: In tree-lined retail areas, people shop more often, longer, and spend about 12 percent more than in retail districts without trees.[2]

Stormwater: 100 mature trees capture approximately 139,000 gallons of rainwater a year—water is absorbed, evaporates, and slowly soaks into the ground, reducing runoff.[3]

Air Pollution: 100 trees remove 53 tons of carbon dioxide and over 400 pounds of air pollutants.[4]

Crime: a 10 percent increase in tree canopy is associated with a 12 percent drop in crime.[5]

Other Issues to Consider

Here are other issues to consider when installing street trees:

Signs: To ensure building or street signs are visible, consider installing tall trees, with the lowest branches 12 to 14 feet above the ground, and provide adequate clear space between trees and signs.

Street lights: Pedestrian-scale lights are best, as they generally don't conflict with street trees. If needed, place trees and street lights about 10 feet apart.

Utility wires: Depending on the height of the utility wires, there are two options: either install tall trees so the canopy is above the utility wires; or short trees that won't need drastic trimming around utilities.

Underground utilities: Mark out any underground utilities in the area to avoid planting trees over them.

Technical Guidance

View our technical appendix for more detailed information about some of the topics covered in this article.

Local Planning Tools

A tree ordinance can create a tree commission, require a tree inventory and management plan, and outline tree maintenance requirements. Good ordinances also require coordination between a tree commission and other municipal bodies, and provide for the tree commission to review proposed site plans.

Currently, seven municipalities in Dutchess County have a shade tree commission or similar body. These committees are responsible for the regulation, planning, care and control of all trees on municipal property and right-of-way. To ensure that local goals for street trees and sidewalks are coordinated, consider establishing a joint sidewalk/street tree committee or appointing a tree committee member as a liaison to the local sidewalk committee, if one exists.

The "Right Tree in the Right Place"

Ultimately, successful street trees rely on selecting the right tree for the location and making sure it has adequate soil, water, and air to thrive. There are many options for creating sidewalk environments that support trees. Work with your local tree commission, a landscape professional, and the roadway owner (NYSDOT, Dutchess County DPW, or your local Highway Superintendent) to ensure the success of your street trees.

[1] 2004 study by University of Pennsylvania's Wharton School; cited in Urban US Forest Service, Trees Pay Us Back, 2005.
[2] University of Washington's Center for Urban Horticulture study; cited in US Forest Service, Trees Pay Us Back, 2005.
[3] US Forest Service, Trees Pay Us Back, 2005.
[4] US Forest Service, Trees Pay Us Back, 2005.
[5] Baltimore Sun, May 19, 2012; study by US Forest Service.

More Information

Greenway Guide: Street Trees

Cornell Community Forestry

Cornell Urban Horticulture Institute

Bartlett Tree Research Technical Report: Sidewalk Repair Near Trees

NYS Urban Forestry Council

More Information *(continued)*

NYSDEC Urban and Community Forestry

Arbor Day Foundation

Planting Street Trees Beyond the Right of Way, by Al Wegner

FHWA: Construction Techniques to Lessen Maintenance for Sidewalks and Paths

Click here to view past issues of *Plan On It*.

This newsletter was developed by the Dutchess County Department of Planning and Development, in conjunction with the Dutchess County Planning Federation.

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Natural Features
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Multiple Uses
Parking Areas
Transit Access
Public Space
Landscaping
Architecture
Sign
Design Standards

Design Principles for Commercial and Industrial Sites

By Holly L. Thomas

Site plan decisions have a lasting effect on a community's appearance and function. The design of development projects is, therefore, a matter of public concern. This report briefly presents elements that form the basis for better site planning and twelve principles for designing and evaluating commercial and industrial site plans. It is a framework for a series of educational briefs that will address many of these principles in more detail.

Keys to Better Site Planning

Several elements ensure that new development or redevelopment projects will turn out well for all concerned.

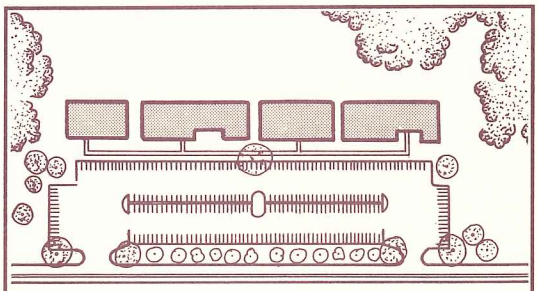
First, a well thought-out comprehensive plan and zoning consistent with that plan should support high standards for all development. Weak regulations lead to weak or cumbersome decisions. Outdated or inconclusive plans are not likely to match the community's needs and are difficult to defend if challenged.

Second, zoning and site plan standards should be well crafted, up to date, and innovative. They should include design guidelines or standards to ensure that new development will fit harmoniously with the best of what already exists.

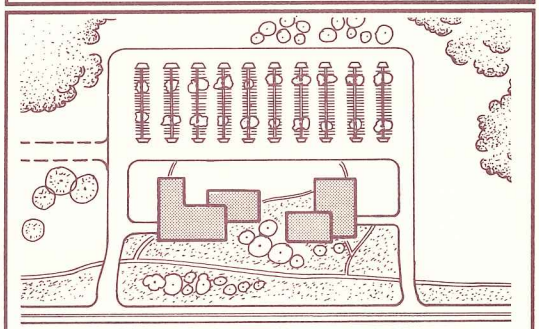
Third, the community must lead developers to consider the interrelationships among sites. These interrelationships can include traffic patterns, open space connections, routes for bicyclists, pedestrians, and transit vehicles, visual impacts, links to housing and recreation for prospective employees and clients, and so on.

Fourth, every project should be held to the high standards needed to accomplish the community's goals. Local officals should consistently enforce environmental protection, open space, landscaping, parking, circulation, pedestrian access, and other standards.

Fifth, the community should understand how its standards can improve a project's quality and marketability. Development is a risk-ridden business and these risks are voluntarily incurred. The best designers and developers know how to profit while meeting community standards and are attracted to careful communities.



Typical Light Industry/Commercial Plaza
Parking in Front Dominates Site, Perfunctory Landscaping, Required Open Space Concentrated at Rear of Site, Building Shapes Uninteresting and Monolithic, No Sidewalk Links, No Plan Made for Access to Adjacent Site



Preferred Light Industry/Commercial Plaza
Parking in Rear, Landscaping Dominates Site, Required Open Space Used to Enhance Site Design, Building Shapes More Interesting, Pedestrian Trail Provided , Accessway to Adjacent Site Reserved for Future Use

Site Planning Principles

With these keys in mind, the following 12 site planning principles should be applied.

1. Preserve and Take Advantage of Natural Features

- Shape the site plan around important natural features, not vice versa; look at these features before the design is even conceived. For example, consider mature trees, rock outcrops, slopes, wetlands, and stream channels as landscape components and opportunities, not obstacles.
- Use natural features as amenities to minimize maintenance costs and environmental impacts and to relate footpaths and the landscape plan to the larger open space system.

Volume 1 Design Series For Planning November 1991

2. Design and Protect the Open Space System

- Establish a minimum open space requirement, and arrange it on each site so that it works as part of a system rather than only as a percentage of lot size.
- Develop an open space system plan for each site, in addition to the landscape planting and drainage plans.
- Link the natural open space system to the landscaping plan by landscaping with native species and low maintenance plants as much as possible.
- Develop community landscaping standards and street tree programs. Encourage groups to "adopt" street fronts, boulevard medians, and other landscaped public spaces to maintain and improve them.

3. Give Pedestrians Priority

- Include walkways in all commercial and industrial site plans; use them to link parking lots, transit stops, and buildings on site and with adjacent properties. Provide connections to nearby residential, recreational, and institutional uses as well.
- Coordinate these pedestrian systems with access for buses and vans.
- Provide benches, shade, and human-scale lighting.
- Provide planted or landscaped strips between the sidewalk and road. Enforce requirements that the landscaping be kept in good condition.
- Encourage traditional street-front designs that group buildings close to roads and use windows to appeal to **passersby in community centers, instead of strip-mall** designs with deep setbacks and less interesting facades.

4. Control the Coverage

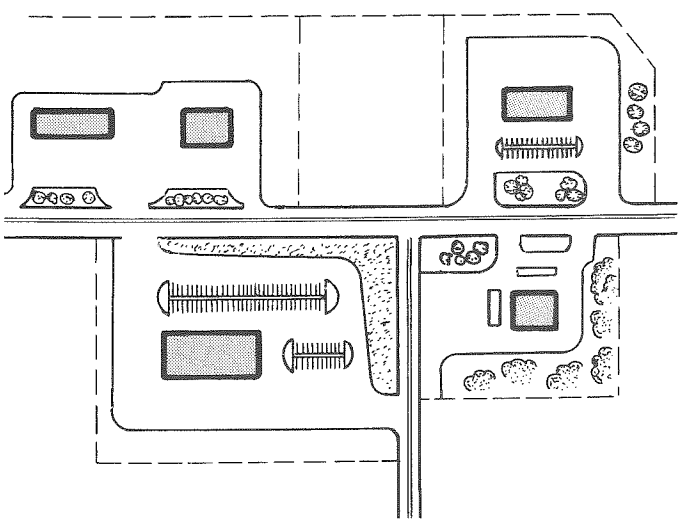
- Establish maximum coverage limits for all paved or impervious surfaces, including all parking areas and drainage systems.
- Tailor those limits to the community; densely settled areas such as cities, village centers, and some hamlets warrant a higher coverage allowance than more sparsely developed areas.

5. Minimize Traffic Impacts

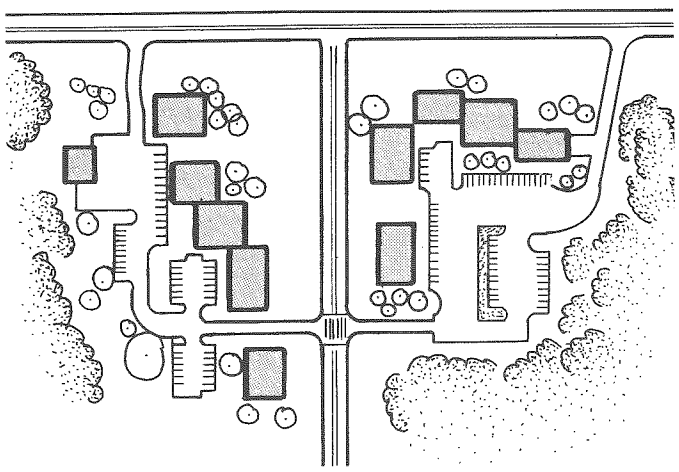
- Require developers to construct and maintain links to adjacent uses. Where adjacent parcels will not be developed for some time, require the developer to leave the accessway clear and provide for its future construction through deed restrictions and bonds or contributions to a transportation improvement fund.
- Require or provide incentives for the sharing of access points, especially near intersections with traffic lights.
- Limit the opportunity for left turns or cross-traffic turns that require new median cuts or an additional signal on a major highway. These turns should be handled through service roads or existing traffic lights.

6. Encourage Bus, Bicycle, Van Access

- Design new projects so that they can accommodate transit vehicles with suitable turning areas, drop-off points, and bus shelters.
- Include bike parking areas and bikeways within all major site designs and downtown development plans. Connect but do not necessarily combine them with pedestrian routes.



Typical Commercial Intersection
Parking in Front, Each Site Has Own Access to Main Road, Minimal and Fragmented Landscaping, Generic Architecture



Preferred Commercial Cluster
Parking Behind Buildings, Shared Access to Both Roads, Ample and Unified Landscaping, More Interesting Architecture

7. Break Up, Conceal, and Buffer the Parking Lots

- Place parking along the side and rear of buildings rather than in front. In community centers, place the buildings near the streets to further conceal the parking and to link the site to the streetfront and sidewalk systems.

- Generously landscape the lot and its perimeter. Include the area within the parking fields in the landscape plan as well, with the planting distributed among islands of shrubs and shade-giving trees.

- In areas that can handle the traffic concentration or where low speeds are called for (as in a community center), offer bonuses in commercial footage in exchange for the construction of parking decks and underground parking areas.

- Use the most current parking generation rates to ensure that parking lots are not over- or under-sized. Allow complementary uses to share some of their parking spaces.

- For large projects, allow developers to postpone full construction of the parking lot until demand is evident. A performance bond can ensure proper compliance.

- In congested highway corridors or downtowns link the required lot size and permitted square footage to efforts to limit traffic. For example, give bonuses for effective ride-sharing and shuttle bus programs.

- Make the parking fit the normal need, not the worst case scenario, and provide alternative, unpaved parking areas for peak volumes. For example, shopping centers can provide grassed fields with trees to accomodate holiday shoppers instead of paving every conceivable space.

8. Encourage a Mixture of Uses

- Look for opportunities to encourage a mixture of uses in one building as well as on one site, as long as those uses complement each other and the site is an appropriate size. Work with building code officers to tailor permitted uses within any one building to fire code and insurance requirements.

- Encourage the mixing of residential, commercial, and office spaces in downtown or main street business districts and strive for a traditional "main street" feeling in the site design.

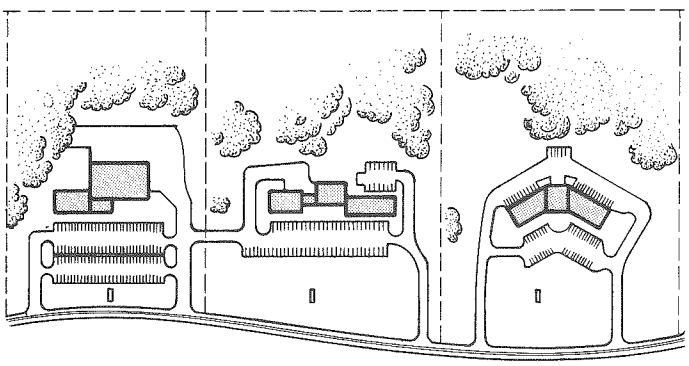
- Encourage second and third floor apartments over small businesses.

9. Use Architecture that Fits the Community

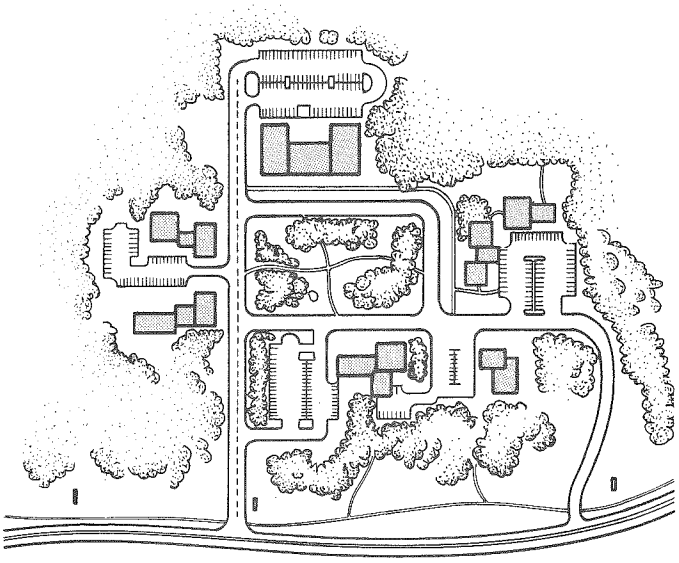
- Make sure that site plan regulations specifically include architectural quality and compatibility among the items to consider in any review.

- Develop specific illustrated architectural guidelines based on local standards, patterns, and preferences.

- In high density areas such as town centers, hamlets, cities and other appropriate areas, use short maximum setbacks to require that buildings be placed near the street. This will help conceal the parking areas and make the sign and landscape designs effective at a smaller scale.



Typical Commercial/Office Strip
Parking in Front, Multiple Curb Cuts, Maximum Visual Intrusion and Site Clearance, No Trail System, Unpleasant Pedestrian Environment, No Common Open Space, Existing Woodland Pushed to Rear of Sites



Preferred Commercial/Office Group
Parking in Interior of Site, Shared Access to Main Road, Minimal Visual Intrusion on Landscape, Sidewalk and Trail System, Common Space for Site Workers and Visitors, Existing Woodland Used as Landscape Buffer

- Encourage conversions of older houses, in keeping with community design themes, rather than their demolition and replacement.

10. Provide a Sense of Public Interest and Public Space

- Include benches and public spaces, covered walkways, arcades, awnings, etc. in the entryways, walkways, and open space systems wherever feasible.

- Make the commercial site interesting and lively. For example, include restaurant patios, courtyards, cafes, or other appropriate outdoor activity areas.

11. Improve the Signs

- Develop design guidelines that call for coordinated styles and materials.

- Limit the number and size of signs permitted for each use or site.

- In high traffic corridors, reduce the number of permitted signs to limit the visual distraction they cause.

- Discourage the use of menu signs with numerous items or long lists of stores.

- Incorporate signs into the architecture. Encourage the use of wall signs rather than free-standing signs.

- Establish sign districts for areas of special concern.

12. Use Design Standards to Pull It All Together

- Develop illustrated guidelines and standards tailored to the appearance and priorities of the community. These should include landscape designs, parking arrangements, sign themes, walkway designs, connections with adjacent properties, and architectural features (such as preferred building materials, height limits, building mass, facade treatments, and roof and window patterns).

- Make the illustrations widely available to residents and developers to give them a clearer idea of what the community wants and where it is willing to be flexible.

- Build in enough flexibility to meet the needs of specific projects while insisting that they enhance the community character.

Taking the Initiative

If local officials and residents don't know what they want their community to be like, a developer cannot be expected to know. Every community must figure out what it wants and write it down. Then it can develop, apply, and enforce standards built on these concepts and others that match its vision. Some of the steps each municipality can take to lead development in the right direction are:

- Periodically survey community opinion about specific needs and ideas, and incorporate these preferences into site-specific strategies and comprehensive plans.
- Publicly acknowledge and reward good examples of architectural or site design and landscaping.

- Provide incentives for and commend examples of cooperation among landowners, businesses, and residents involved in specific community improvement projects (i.e. downtown clean-up campaigns, providing flower beds and landscaping near shared walkways and parks, maintaining planted medians along public highways, etc.)

- Enlist volunteers and civic groups in designing and maintaining areas for public use or benefit, including street trees, mini-parks, walkways, open space links between commercial and residential sites, etc.

- Seek out developers for important sites targeted for commercial or industrial use instead of reacting only to whomever comes before your local boards. Look for a track record of creative and responsible site design.

- Identify and work with owners of lands planned for conservation or a mixture of development and conservation to develop fair and specific ways to protect those lands while allowing for its appropriate use.

- Keep an eye on what is happening in adjacent communities and anticipate how it might affect your own.

Conclusion

Municipal boards can work with developers and achieve community goals if their comprehensive plans and local zoning laws reflect these twelve principles. By incorporating the principles into official documents, decision makers will strengthen their legal authority and will be able to negotiate effectively with developers and residents. Specific illustrated design guidelines based on these principles will further improve the process. Having clear guidance available will also make it easier for community leaders to combine incentives with regulations to produce projects worthy of acclaim.

This is one of a series of brief reports the Planning Department is preparing on community design issues. Subsequent reports will examine design principles in more detail.

Illustrations Adapted From:

The Fort Drum Land Use Team. Community Design Guidelines Manual. Watertown, NY: The Fort Drum Land Use Team, 1990.

Yaro, Robert D., Randall G. Arendt, Harry L. Dodson, and Elizabeth A. Brabee. Dealing with Change in the Connecticut River Valley: A design Manual for Conservation and Development. Amherst, MA: Center for Rural Massachusetts, University of Massachusetts at Amherst, 1988.

Financial assistance for this Technical Memorandum was received from the U.S. Department of Transportation and the New York State Department of Transportation. The conclusions and recommendations are the responsibility of the Dutchess County Department of Planning.