

We Can Make Places in Acton Better with Sidewalks

Here's How

Guidelines for Acton Sidewalk Design



by the Sidewalk Committee, Town of Acton, version one
with help from Town Staff, the Design Review Board, the Transportation Advisory Committee, and Town Citizens

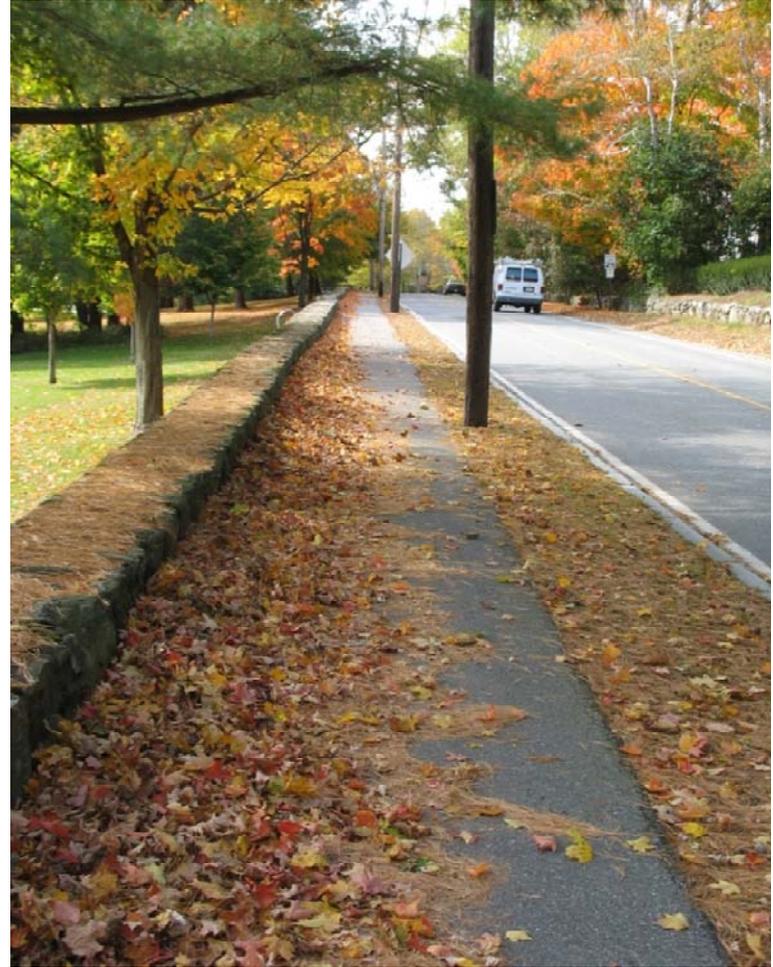
Guidelines for Acton Sidewalk Design

- I. Summary of Goals (page 3)
- II. Visual Examples (pages 4-9)
- III. Issues (pages 10 – 16)
 - Width
 - Landscape Buffer
 - Materials
 - Lighting
 - Environmental Impact
 - Accessibility
 - Obstacles and Curb Cuts
- IV. Addenda (pages 17 – 21)
 - A: Landscape
 - B: Internet Resources

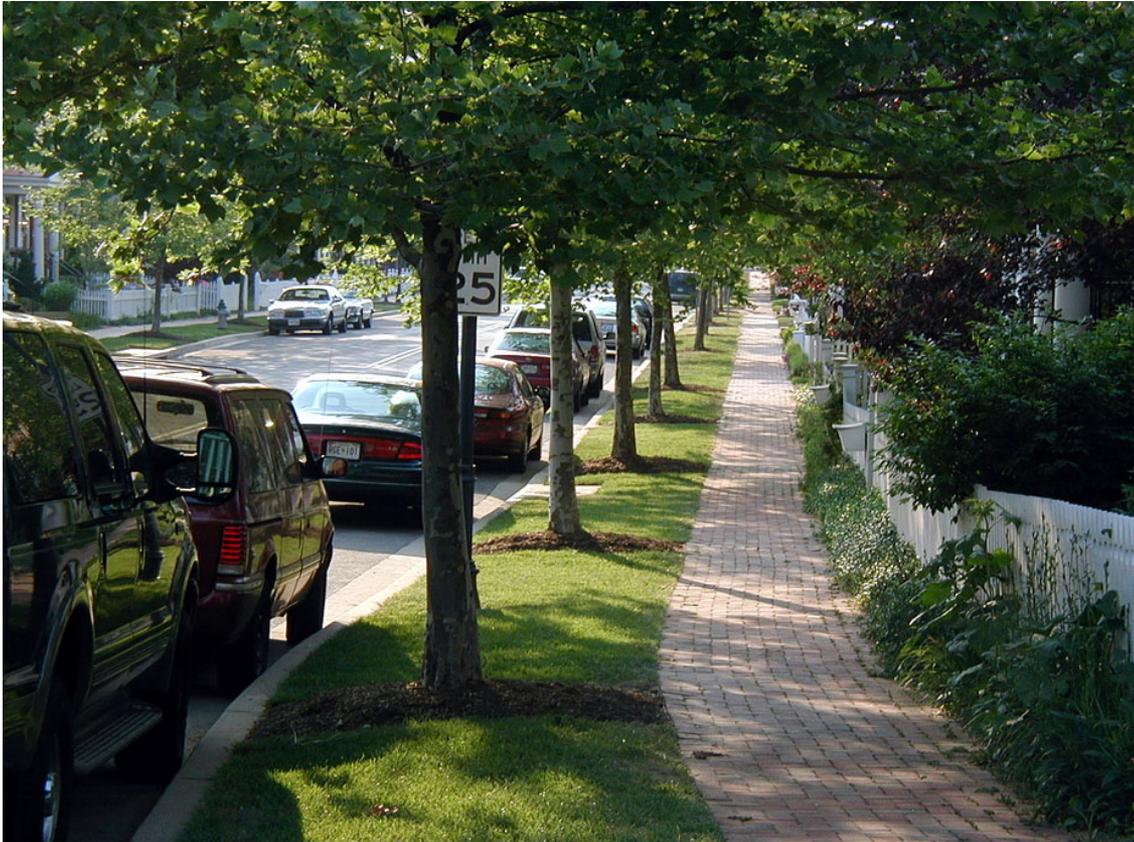
Summary of Sidewalk Design Goals:

- Pleasurable and safe walking experience for all populations
 - protected from road traffic
 - attractive landscaping and/or interesting views
- Contextual sensitivity
 - in keeping with the nature of the area – whether rural, historic, commercial, residential, wooded, or wetlands
 - design materials and design approach consistent with what's already in place
- Ease of maintenance during different seasons
- Longevity of materials
- Environmental sensitivity
 - preservation and enhancement of existing landscape (e.g. preserving trees and/or planting new appropriate trees)
 - protecting wetlands from storm water runoff and road pollutants
- Cost appropriate

A well-designed sidewalk looks like it belongs



Grass, shade trees, or parked cars protect walkers from traffic



And can significantly enhance a neighborhood

Rte 2A - What got built



What could have been



Well-designed sidewalks make a Village more desirable



Contrasting curb materials separate the sidewalk from the road



Cut granite curb and asphalt sidewalk



*Asphalt curb blends in with road:
less safe, less attractive*

Alternatives to grass can be attractive and environmentally beneficial



Acton Sidewalk Guidelines – Issues Checklist

Sidewalk Width

A sidewalk width of five feet (5') is needed for two adult pedestrians to comfortably walk side-by-side, and in most circumstances five feet (5') should be considered the minimum sidewalk width for local or collector streets.

Summary of general width guidelines:	
Local or collector streets	Five feet (5')
Arterials or other major streets	Six to eight feet (6' – 8')
Along parks, schools, and other major pedestrian generators	Eight to ten feet (8-10')

Exceptions – when a narrower sidewalk (four feet, 4') may be appropriate:

- In order to preserve healthy trees or other natural landmarks
- In order to preserve room for a planting strip

Sidewalk Landscape Buffer

An important component of sidewalk design

Planting areas should be provided adjacent to all sidewalks except in cases where physical constraints prohibit such a configuration. A landscaped buffer improves pedestrian safety by separating the pathway from the street. On local or collector streets a minimum width is generally two feet (2'), but wider or varied width buffers (i.e. meandering sidewalk) should be considered when space allows. Allow a minimum four feet (4') width if planting trees (see Addendum A for further notes on trees). From a practical point of view, this strip of land is also a “utility strip” useful for street signs, snow storage, mail boxes, fire hydrants, utility shut-offs, and poles for overhead wires. The approach to the design and planting of this strip must acknowledge its multi-purpose nature.

Planting materials should be chosen which provide visual interest, support the local ecology, require little or no watering or maintenance, and make the pedestrian experience more pleasant. Care should be taken to choose plants whose growth will not create obstructions for the pedestrian nor damage the sidewalk (as certain tree roots may do). In particular, within ten feet (10') of driveways, plants should be no more than thirty-two inches (32") high and tree branches should not hang lower than eighty-two inches (82").

Grass is generally the easiest and least expensive to install but may be harder to maintain over time where mowing is difficult, such as on slopes or near walls. Alternatives should be considered, especially when caretakers can be identified who can provide plants and/or who will care for the area until plants are established (i.e. the property owner or a neighborhood group).

Examples:

- Trees will provide shade and, if placed between the sidewalk and the road, an additional level of pedestrian protection. Shaded surfaces may be 20–45°F (11–25°C) cooler than the peak temperatures of unshaded materials.¹
- A mix of native, low-growing ground covers will provide an alternative to grass that will not need mowing nor frequent watering to survive and remain attractive. Flowers and leaves from native plants will also provide food and habitat for insects that contribute to the natural life cycle of butterflies, birds, and bees, and therefore play indispensable roles in the health of our environment.²
- The nature of the planting materials should be in keeping with the site. Mown grass or compact shrubs may be more in keeping with a commercial district or town center. Wildflowers and grasses may be suitable for certain residential areas and more open landscapes. Larger shrubs can be placed to block undesirable views while not obstructing important sight lines or snow clearing.

See Addendum A for planting guidelines and tree, shrub, and ground-cover suggestions suitable for roadway conditions.

¹ US Environmental Protection Agency, Heat Island Effect, See: <http://www.epa.gov/heatisland/mitigation/trees.htm>

² According to Douglas Tallamy, in *Bringing Nature Home; how native plants sustain wildlife in our gardens* (Timber Press, Portland, OR c 2007) one hour of mowing produces the same pollution as 650 miles driving (p. 118). Preliminary studies show that native plants support between four and 35 times more insects than alien plants (p. 54).

Sidewalk Construction Materials

The ultimate goal is for the new sidewalk to look like it belongs in that location.

Walkway

Bituminous asphalt is an appropriate surface for many areas. It is less expensive than many alternatives, as well as being more environmentally efficient to produce and maintain. Other materials to consider include decomposed granite and crushed stone, brick, pervious paving, or rubber (see p. 14 and Addendum B).

Exceptions -

When a new sidewalk is being constructed to connect to existing sidewalks. In that case, the existing materials in place should be the guideline for the new sidewalk. In most cases, the alternative material will be concrete. Consistency of material choices is a key component in insuring an overall town appearance that is welcoming and appears well cared for.

Curb or Berm

An asphalt berm is a very cost-effective option when the roadway and sidewalk is fairly straight and when there is at least a 2' planting strip. Where the planting strip is wide or raised above street level, there may be no need for a curb at all.

Exceptions: Choice of curb or berm materials should take into consideration:

- Pedestrian Safety

Granite curbs are used to improve safety on sharp turns by making it less likely that a car will stray onto the sidewalk. In this case a vertical granite curb may be most appropriate.

Contrasting curb materials help to visually distinguish the sidewalk from the road, which is especially important when there is no room for a planting strip and/or when the sidewalk material itself is bituminous asphalt. A granite curb, whether sloped or vertical, will clearly demarcate the edge of the roadway from the beginning of the pedestrian environment.

- What's Already There

Final choice of materials should consider what is already in place – existing sidewalks, the adjacent buildings and walkways leading to the sidewalk, stone walls or gates, etc. A granite curb material may be appropriate to complement the stone of an adjacent wall or formality of adjacent buildings.

Stone Walls

A component of creating a sidewalk that fits naturally into the existing environment is to maintain design elements already in place. In particular, stone walls should be preserved in accordance with state law and historic considerations.

Lighting

Sidewalks and crosswalks should be illuminated where there is a safety concern. Additionally, any areas that have (or anticipate) high night-time pedestrian traffic should be illuminated, for public safety and convenience. Generally, sidewalks will *not* be illuminated; just as most roads are not illuminated and cars have headlights to drive at night, citizens may need to provide their own lighting for using town sidewalks after dark.

Additional sidewalk lighting may be desirable for reasons other than safety, such as ambience in one or more of the town villages, to encourage shopping or dining, security of buildings, or to display the beauty of town buildings and public spaces at night. The existence, placement, and style of that lighting is beyond the scope of these recommendations.

Guidelines for Road Types:

- Where a sidewalk is routed across an **arterial road**, the crosswalk should be illuminated so that drivers can see pedestrians.
- The Acton Municipal Properties Department should be asked for a recommendation on whether to light a crosswalk over a **collector road**; they will consult with other town government bodies as appropriate, such as the police and fire departments, Planning and Engineering Departments, and the Board of Selectman.
- Crosswalks over **local roads** generally need not be lit.

Implementation of lighting should follow recommendations by the town, with due consideration for placement, visibility, energy efficiency, cost, operations and maintenance, color rendering, outdoor light pollution, neighbor concerns, etc. The currently recommended default lighting over crosswalks for safety (as discussed above) is 50-100 Watt Metal Halide lights with a flat lens. This lighting may vary for extraordinary circumstances, for example, neighbor concerns, proximity to a public park, or lighting in an historic district.

Hours of Operation of sidewalk and crosswalk lighting is similarly left to the town government.

Environmental Impact Considerations

Materials choice

Sidewalk construction materials other than bituminous asphalt or concrete should be considered where feasible to protect environmentally sensitive areas (i.e. wetlands) or to reduce storm water runoff. For instance:

- **Pervious Paving**

Pervious paving includes porous asphalt, pervious concrete, paving stones, manufactured grass/gravel pavers. Advantages in sidewalk situations can include retention of water for trees and other plant life, protection of streams and water supply, groundwater recharging, capturing of some pollutants, and removal of some pollutants. Use requires deep permeable soils and proper site preparation. Some estimates of installation cost indicate 20-25% above standard asphalt. Maintenance through industrial vacuuming or high pressure hosing is required. Clogging may occur if improperly installed or inadequately maintained and if sand is used in winter. Drainage through pervious paving does not occur when the ground is frozen. Effects of freeze-thaw cycle which may damage the paving can be ameliorated through appropriate installation. It is possible that anaerobic conditions may develop in underlying soil which may interfere with microbiological decomposition. Because there is some risk of groundwater contamination, installation near groundwater drinking supplies is not considered advisable until further scientific data becomes available.

- **Rubber**

Rubber sidewalks are a modular form of pervious paving which are particularly useful around tree roots where concrete and asphalt tend to fail after 5-7 years. Use of rubber sidewalks can mitigate the heat island effect of other paved services. They are delivered in 2 x 2.5' interlocking tiles allowing for either a 4' or 5' wide sidewalk. They last for 20-30 years and have been used in cold weather climates such as Alaska and Canada where they have been plowed using sidewalk snowplows. They are made with 100% recycled tire crumb rubber and waste plastic, meet all requirements of sidewalk-worthiness, including stable grade, non-vibration in compliance with ADA requirements, and high coefficient of friction for non-skid both dry and wet.

Materials cost is comparable to asphalt but there are additional labor costs associated with preparing the ground for installation.

See Addendum B for further information

Landscaping

Planting design and plant choices for areas surrounding sidewalks and streets play a big role in the overall appearance and environmental impact of the sidewalk installation or new development. Trees and other landscaped areas near streets, sidewalks, and parking lots can reduce storm water runoff and adverse impacts to water resources. Trees and vegetation intercept rainfall, and the exposed soils associated with plants absorb water that will be returned to ground water systems or used by plants.

In particular:

- Rain Gardens can be installed along sidewalks to mitigate storm water runoff and to provide an attractive pedestrian experience. Regular weeding will be required in the first year until plants get established, and periodically thereafter.
- Use of native plants and shrubs help restore our natural ecosystems and help insure the survival of the full range of wildlife native to our area.

See Addendum B for detailed list of native plants appropriate for different conditions.

Accessibility for People with Disabilities

Sidewalks present unique challenges to accessibility for which specific guidance is considered essential. When designing sidewalks, the Town of Acton recommends that developers refer to <http://www.access-board.gov/prowac/> for guidance to ensure that sidewalks and pathways are accessible to persons with disabilities. This website addresses various issues including access for blind pedestrians, wheelchair access, and various constraints posed by space limitations, roadway design, slope, and terrain. The guidelines cover pedestrian access to sidewalks and streets, including crosswalks, curb ramps, street furnishings, pedestrian signals, parking, and other components of public rights-of-way.

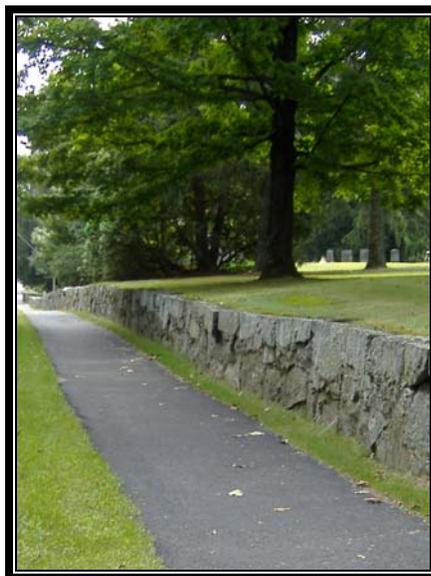
See Appendix B, Accessibility, for links to design guidelines and illustrations

Obstacles

The distance to the bottom of signs placed in or next to a sidewalk should be at least 7' above the sidewalk surface to avoid injury to pedestrians. Guy wires and utility tie-downs should not be located in or across sidewalks at heights below 7'. At crosswalks, any obstacles that interfere with pedestrians' ability to see oncoming traffic or with drivers' ability to see pedestrians (utility poles, signs, or landscaping) should be removed or relocated.

Curb Cuts

There should be only one curb cut for businesses with less than 100' frontage and a maximum of two curb cuts for businesses with wider frontages. In general, curb cuts should be no wider than 30'.



Note: The guidelines provide a checklist of issues to consider in order to achieve our sidewalk design goals. There will be times when the preferred sidewalk layout will require negotiation of easements with property owners; the final design layout will depend on the result of those negotiations.

Addendum A Landscape Guidelines

TREE PLANTING

For more detailed information on tree planting guidelines see Memo from Acton Municipal Properties Director, under Resources: <http://www.acton-ma.gov/index.aspx?NID=108> and/or consult town staff directly.

Location Considerations:

Planting trees in the strip of land between sidewalk and the edge of the road can be attractive and provide a security buffer between pedestrians and automobiles. But this strip of land is referred to by professional arborists as “the death zone” because it is so hostile to trees. Pay attention to the following when assessing tree-planting locations:

- **Wider is better**
- The absolute minimum width of the planting strip should be fully four feet (4'). A planting strip of ten feet (10') in width is much more reasonable.
- Massachusetts General Law Chapter 87 specifically allows the expenditure of public funds for planting Public Shade Tree on private property, within twenty feet of the edge of the right of way. This option should be considered for planting trees along sidewalks on private property, where there is insufficient planting space within the Right of Way.

Choosing Appropriate Trees:

- Evergreen plants are not suitable for sidewalk planting except in very rare circumstances, such as behind a sidewalk for a buffer hedge, evergreen plants are not suitable for sidewalk planting. They tend to be low branched, causing clearance problems, they cast shade in winter, causing icing problems, and most are very salt intolerant.
- Minimum size for trees at the time of planting should be at least two inch (2") caliper, and ten feet (10') in height. This gives enough mass and strength to the trunk to shrug off snow loads, and should be tall enough to be upbranched to provide clearance for pedestrians and vehicles. However, trees should be no larger than three inch (3") caliper and fourteen feet (14') high when planted due to the size of the planting hole required adjacent to the sidewalk.
- The tree stock in any one area should not exceed more than 10% of any one species. Monocultures can lead to widespread tree loss when the population is attacked by an alien invasive insect or disease.
- In matters regarding preservation or replacement of shade trees, the services of a Massachusetts Certified Arborist, or a person certified by the International Society of Arboriculture, should be used.

SUGGESTED SIDEWALK PLANTS

COMMON NAME	BOTANICAL NAME	COMMENTS
Larger Growing Trees		
American Elm	Ulmus Americana	only DED resistant varieties, such as "Valley Forge"
Red Oak	Quercus rubra	acorns!
Pin Oak	Quercus palustris	low branches, acorns!
Swamp White Oak	Quercus bicolor	acorns!
Tupelo	Nyssa sylvatica	hard to obtain large specimens
Red Horse Chestnut	Aesculus x carnea	obtain seedless varieties
Green Ash	Fraxinus pennsylvanica	best is "Marshall's Seedless Ash"
European Linden	Tilia cordata	many varieties, susceptible to aphids and Japanese Beetles
Yellowwood	Cladrastis kentuckea	extensive surface roots
River Birch	Betulus nigra	obtain single stem specimens
Freeman Maple	Acer x freemanii	hybrid Red Maple / Silver Maple
Kentucky Coffeetree	Gymnocladus dioicus	slow growing
Honeylocust	Gleditsia triacanthos	many cultivars, "Shademaster" might be best
Zelkova	Zelkova serrata	form is similar to American Elm
London Plane	Platanus x acerifolia	exfoliating bark
European Hornbeam	Carpinus betulus	can get columnar varieties for narrow spaces
Pignut Hickory	Carya ovata	round nuts!)
Smaller Growing Trees		
Japanese Tree Lilac	Syringa reticulata	fragrant, attractive to honeybees
Korean Mountain Ash	Sorbus alnifolia	colorful fruit
Kousa Dogwood	Cornus kousa	late May flowering
Flowering Dogwood	Cornus florida	plant in morning sunny areas
Rose of Sharon	Hibiscus syriacus	late summer flowering, attractive to Humming Birds
Crabapple	Malus sp.	many varieties, 'Adams' might be best along sidewalks
Amur Maple	Acer ginnala	will require frequent pruning
Redbud	Cercis candensis	many have winter dieback
Paperbark Maple	Acer Griseum	exfoliating bark

Hedge Maple	<i>Acer campestre</i>	dense branching, little fall color
Callary Pear	<i>Pyrus callaryana</i>	many cultivars, avoid 'Bradford'
Kwanzan Cherry	<i>Prunus serrulata</i>	vase shaped, profuse pink flowers
English Hawthorn	<i>Crataegus laevigata</i>	("Crimson Cloud" is thornless)
Plants for Hedges and Buffers		
Lilac	<i>Syringa vulgaris</i>	many varieties, need sun for blooming
Rosebay Rhododendron	<i>Rhododendron maximum</i>	native, large growing
Red Cedar	<i>Juniperus virginiana</i>	native, salt tolerant evergreen
Arborvitae	<i>Thuja occidentalis</i>	evergreen
Bayberry	<i>Myrica pensylvanica</i>	native, salt tolerant, semi-evergreen
Rugosa Rose	<i>Rosa rugosa</i>	salt tolerant, withstands drought, thorny
Note: Should not plant shrubs higher than 32" within ten feet (10') of driveways or intersections		
Ground Covers For Sun		Consider height, aggressiveness, walkability, drought and salt tolerance
Bearberry	<i>Arctostaphylos uva-ursi</i>	small, trailing evergreen, 7" h, pinkish-white flowers May, red berries fall
Creeping Juniper	<i>Juniperus horizontalis</i>	
Lowbush Blueberry	<i>Vaccinium angustifolium</i>	deciduous shrub to 2', small white-pink flowers May-June, blueberries June-August, red fall foliage, native (can take part-shade, likes dry soil)
Sedums		low-growing, succulent plant that tolerates hot, dry conditions and poor, stony soils; many varieties with different leaf and flower colors
Thymes	<i>Thymus praecox</i> , <i>Thymus serpyllum</i> , etc	aromatic evergreen ground cover, small flowers late spring/summer (depending on variety), good for dry, infertile soil. Attracts bees.
Ground Covers for Shade		
Wild ginger	<i>Asarum canadense</i>	deciduous native with large heart-shaped leaves, 8", moderately moist soil
Hay-scented fern	<i>Dennstaedtia punctilobula</i>	lacy, yellow-green leaves, dry soil, native
Green-and-Gold	<i>Chrysogonum virginianum</i>	yellow flowers May-Sept, 8", can take full sun, moist soil
Creeping phlox	<i>Phlox stolonifera</i>	pink-violet flowers May, 6", moist soil

Addendum B Internet Resources

Topic	Link	Comments
Federal Standards		
	http://www.fhwa.dot.gov/environment/sidewalk2/contents.htm	
General Design guideline examples		
	http://www.allstonbrightoncdc.org/pdfs/Green%20Streets%20Guide%20for%20Allston%20Brighton.pdf	Guidelines for new Allston/Brighton development. Includes useful before and after pictures as well as landscape options for reducing stormwater runoff
	http://www.ci.minneapolis.mn.us/public-works/trans-plan/DesignGuidelines_StreetsSidewalks_022708.pdf	Feb 2008 Design Guidelines for Streets and Sidewalks in Minneapolis
Accessibility		
	http://www.fhwa.dot.gov/environment/sidewalks/chap4a.htm	Federal Highway Administration. Guidelines for urban areas. Helpful illustrations for how to create accessible sidewalks.
	http://www.access-board.gov/prowac/alterations/guide.htm	United States Access Board, design guidance for rights of way including sidewalks
Environmental Considerations		
	http://www.pavement.com/Downloads/RT/RT3.05.pdf	Strategies for reducing heat island effect of paved surfaces
	http://eetd.lbl.gov/HeatIsland/	ditto
	www.epa.gov/heatisland	Impact of heat islands, mitigation strategies, and other resources
	http://www.buildinggreen.com/menus/drillBC.cfm?BuilderCategoryID=14	Green products and strategies related to site work and landscaping
	http://www.mass.gov/envir/smart_growth_toolkit/pages/CS-lid-acton-new.html	Acton Discovery Museum case study in low-impact development including pervious paving
	http://bringingnaturehome.net/native-gardening	Includes native plant list for East coast suburban landscape. Data on importance of landscape choices for preserving biodiversity and the health of our ecosystem.
	http://www.newfs.org/publications-and-media/articles/the-biodiversity-all-stars.html/	Discussion of top native plants for supporting biodiversity, by Bill Cullina for the New England Wildflower Society
	http://www.mass.gov/Eoeea/docs/eea/water/raingarden.pdf	Rain gardens including list of MA appropriate plants for different conditions.
	http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/SPU_001805.asp	Rain Gardens for Storm water management. Seattle Street Edge Alternatives (SEA Streets) Project.

Grass alternative planting materials and “no-mow” grass		
	www.stepables.com	Commercial nursery specializing in walkable groundcovers
	http://classygroundcovers.com/	Commercial nursery specializing in bulk orders for groundcovers. Useful images.
	http://www.prairienursery.com/store/index.php?cPath=11&main_page=index	Low maintenance turf mix for sun or partial shade. Once established, requires little or no watering or fertilizing and limited or no mowing.
Pervious Paving		
	http://www.concretenetwork.com/pervious/	Multiple links to information about pervious concrete paving
	http://www.boston.com/news/local/massachusetts/articles/2008/10/26/pavement_thats_porous_gains_ground/?page=2	Oct 26, 2008 Boston Globe article about growing use of porous pavement in Northeast projects.
	http://www.mapc.org/regional_planning/LID/permeable_paving.html	Metropolitan Area Planning Council
	http://water.wikia.com/wiki/Permeable_paving	Wikipedia definition
	http://www.cityofboston.gov/environment/pdfs/hpb_guidelines.pdf	Boston sustainable design guidelines include pervious paving
Alternative materials: rubber, decomposed granite and crushed stone		
	http://www.rubbersidewalks.com/default.aspx	Sole source manufacturer of modular pervious paving using recycled materials. Contact Dan Joyce: danjoyce@rubbersidewalks.com , 714-964-1400.
	http://www.kafkagranite.com/decomposed_granite/index.php	Useful for a more rustic or historic look than regular asphalt or concrete
Traffic calming		
	http://seedmagazine.com/news/2006/12/where_the_sidewalk_ends.php?page=all	
	http://www.pps.org/info/placemakingtools/casesforplaces/livememtraffc#WIDENING%20SIDEWALKS/NARROWING%20STREETS%20AND%20TRAFFIC%20LANES	
	http://www.walkinginfo.org/engineering/calming.cfm	
	http://www.pedbikeimages.org/category_front.cfm?categoryId=67	Pedestrian and bicycle information center image library