A Sustainable Vision for West Union

Integrated Green Infrastructure to Achieve
A Renaissance of
West Union's Downtown District and Neighborhoods

Prepared for:

The City of West Union, Iowa

And the

Iowa Department of Economic Development

Prepared by:

Conservation Design Forum

Conservation Research Institute

September 12, 2008

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I. Introduction

The City of West Union is a small Iowa town that typifies many primarily agriculturally-based rural communities. It is the Fayette County seat, with a population of less than 3,000. The people of West Union have a long standing history of civic pride and leadership, and have maintained very high quality community amenities, services, and infrastructure. As the community has aged, it has once again become time to renovate and improve "Main Street" (actually Vine Street) and many other aspects of the infrastructure in the downtown district. The City's leadership has decided to pursue a new, sustainable approach towards improving this infrastructure in a way that will provide a range of benefits, and serve the citizens and merchants of West Union well beyond the time when traditional infrastructure typically needs replacement or reconstruction.

A Unique Opportunity

A number of related factors have aligned recently that, in combination, present West Union with a truly unique opportunity to develop leading edge green, or sustainable, community infrastructure:

- **First**, the city has already determined the need to replace streets, sidewalks, utilities, and stormwater management systems in the downtown as a matter of first priority. Conceptual designs envision a six-block area of this infrastructure undergoing major renovation in the very near future.

- **Second**, recent events throughout the country have underscored the vulnerability of conventional infrastructure and land management practices, resulting in flooding, property loss, and environmental degradation. A range of applications and materials in urban green infrastructure sustainable practice have recently been developed and used, and are becoming widely available throughout the country. These practices improve the performance and reduce the perpetual maintenance and operations costs of community infrastructure, while doing a superior job of protection and restoration of the environment and ecological functions.

- **Third**, individual health and fitness levels have declined to the point where state and federal initiatives are promoting land use and transportation patterns that make walking and bicycling safe and convenient alternatives to driving between homes, schools, jobs, and services. A number of public agencies, many municipalities, and national organizations such as the Congress for New Urbanism (CNU) all identify and communicate the direct correlation between pedestrian-friendly conditions and healthier citizens.

- **Fourth**, rapidly rising energy costs have amplified the need to rethink community transportation infrastructure as well. A nationally-based "complete streets" initiative is now underway to reinvent community infrastructure to better serve citizens with facilities that integrate a range of transportation alternatives within public rights-of-way, which is a direction the nation is beginning to embrace. Communities such as West Union are in an advantageous position in that interconnected pedestrian and bicycle-friendly streets and corridors are fairly easily adapted into the existing community fabric as compared with typical post WWII suburbs on the outskirts of many larger cities.

- **Fifth**, studies have shown that communities are better served from a fiscal standpoint with pedestrian scale, multi-purpose streets. Retail sales are better in shopping areas served by safe, attractive streetscapes. Tourists are drawn to these kinds of authentic town settings. Property values are increased as well.

- **And finally**, the Iowa Department of Economic Development (IDED) has recognized the need for Iowa to become a leader in community-scaled, green infrastructure practices as a critical component of sustainable communities. It is now strongly promoting green streets as an essential element of the draft Green Communities checklist, and is committed to the long-term evolution of these concepts. IDED has selected West Union as one of two pilot communities in the entire state to help demonstrate its new green streets initiative. Along with this designation comes a range of resources and assistance.

Background from IDED

Communities, for-profit and non-profit organizations, and government leaders across Iowa are recognizing that "business as usual" no longer works as we all face the many challenges of today. Challenges that include energy use and supply, climate change, water quality, natural disaster preparation and recovery, transportation issues, an aging population, and livability and walkability for health and recreation. In essence, the challenges are to make our communities more environmentally, economically, and socially sustainable.

Communities across the state are seizing opportunities to marry economic, social and environmental prosperity to create the thriving communities of tomorrow. Local leaders along with engaged citizenry are working towards communities that are more aesthetically pleasing and healthier physically, environmentally and financially. The Iowa Department of Economic Development is also seizing this important opportunity.

To support Iowa's communities in their greening efforts, the Community Development Division of the Iowa Department of Economic Development (IDED) is revising its operations and programming to ensure that all of the division's current programs, efforts, policies and initiatives dealing with community growth and development have an environmentally conscious approach that promotes sustainability. The department has also begun to synthesize its green efforts with other state and local efforts.

While all of these efforts are important, team members of the Community Development Division realized that to truly make a positive, transforming impact in a community, the various resources of the division and its partners must be integrated together and focused in on one or two communities at a time to have a large and more immediate impact. Therefore, the department launched an internal effort in January 2008 to identify one or two communities to participate in a pilot to demonstrate a holistic approach to implementing sustainable community concepts across a downtown or entire community.

After overlaying many differing criteria, the department selected West Union as a model pilot community. Some of the reasons for selecting West Union include:

- Existing participation in the Main Street Iowa community
- Two of Iowa's three main investor-owned utilities serve West Union
- IDED staff had already completed façade designs for 22 buildings in West Union
- IDED has current affordable housing projects in West Union
- West Union was already planning a nearly $4 million streetscaping project
- West Union is a county seat
- The county courthouse and a middle school anchor West Union's town square
- West Union's population of 2,549 is representative of many Iowa communities
- The people of West Union have made several recent investments in their future including expansion of health care services, a recreation park, new aquatic center, new performing arts center, and participation in a regional Kellogg Foundation nutrition and fitness initiative.

Integrated Visioning Workshop

This document is the product of an intensive, two-and-a-half day visioning session conducted in West Union from June 24th through the 26th of this year. It represents a critical milestone in the on-going planning and implementation process for West Union to realize and benefit from the full potential of a green infrastructure initiative, and what that effort will then set into motion for the community. During the workshop, the participants identified the desired community elements and qualities for West Union articulated in this report. The vision and concepts described and illustrated in this document include suggestions for alternative roadway designs and materials, rainwater deployment, pedestrian-friendly public spaces, and the enhancement of community retail and residential properties. The integration of these urban design elements into the street design for Vine Street as an initial pilot project, and eventually adapted to other streets and infrastructure throughout West Union, compliments and puts into practice recommendations of the Iowa Department of Economic Development's Main Street Iowa program.

Workshop Participants

West Union and IDED are extremely grateful to those who contributed their time and talent to the workshop, and look forward to their continued involvement, along with many others, as this vision becomes realized. In addition to the project team members from CDF and CRI, the following individuals participated in the workshop:

Participant	Affiliation
Bob Anderson	Reporter - The Union
Bill Bennett	Fayette SWCD
Craig Bennett	West Union Realtor
Neal Bentley	West Union Resident/Teacher
Jon Biederman	TeKippe Engineering
Jerry Blue	West Union Newspaper (The Union)
Jane Blumhagen	West Union Chamber of Commerce/Business Owner
Jim Boelman	West Union Resident/Business Owner
Teresa Bomhoff	USDA-RD
Robin Bostrom	Main Street West Union
Tobin Britt	West Union Resident
Carrie Davis	Fayette SWCD
Merlin Dunt	West Union Mayor/Resident
Martin Games	West Union City Administrator/Resident
Gail Hackman	Main Street West Union/Business Owner
Derek Heins	West Union Resident
Tim Lane	IDPH
Mike Lauer	Main Street West Union/Business Owner
Jim Maloney	TeKippe Engineering
Mark Moser	Main Street West Union/Resident
Karla Organist	Main Street West Union
Wayne Petersen	IDALS
Greg Ptacek	Main Street West Union/Resident
Brian Reichter	West Union Chamber of Commerce
Tim Reinders	Main Street Iowa
Vicki Rowland	Fayette County Supervisor
Ron Saboe	Main Street West Union/Business Owner
Darlene Strachan	Main Street Iowa
Brent Tapper	West Union Resident
Jeff Tisc	IDALS
Kara Wedemeier	Main Street West Union/Business Owner
Brad Whelan	West Union Resident
Bruce Williams	Department of Cultural Affairs
Dick Woodard	Main Street West Union/Business Owner

Objectives

West Union will be best served by a public realm that

- Is safer and more inviting for walkers, handicapped persons, and bicyclists,
- Encourages alternative transportation choices to the automobile,
- Promotes physical activity and public health,
- Creates opportunities for social interaction,
- Provides a beautiful, authentic, comfortable setting conducive to dining and shopping,
- Appeals to all ages,
- Promotes a vibrant setting for shops and eateries,
- Enhances the environment.

A complete, **integrated streetscape design** that strives to achieve these goals will most likely **bring more people to the downtown district of West Union** (*see Appendix ii, The Economic Benefits of Walkable Communities*). Amenities such as street trees, appropriate lighting, and artistically constructed street furnishings can provide functional comforts, as they reinforce a sense of place and urban character. Simple and attractive practices designed to slow, cleanse, cool, and retain rainwater runoff from impervious surfaces can reduce the direct concentrated discharge of polluted runoff into downstream aquatic resources, and lower the costs of infrastructure construction and maintenance.

Intended Results

The focus of this visioning effort is two-fold for the sustainable redevelopment and improvement of West Union's downtown district, and the eventual renewal of every block and neighborhood in the City over time:

1. To serve as a guide to influence an expanded, sustainable approach towards immediate community infrastructure and public space redevelopment, including the currently planned six-block streetscape project on Vine Street;
2. To influence and inspire a sustainable approach towards any improvement, renovation, or development of existing or new buildings, infrastructure, and other public improvements, as well as private expenditures and investments in similar elements.

As the first phases of infrastructure are completed, they will further inform and provide tangible demonstrations to build upon for West Union and other communities in Iowa and throughout the country.

II. West Union's Mission and Vision

MISSION STATEMENT

The mission of Main Street West Union is to preserve and enhance the vitality of our downtown through the education and encouragement of all citizens to work together to promote our community as a vibrant place to shop, work and live.

VISION STATEMENT

- West Union will tap the talents of its citizens to create a vibrant county seat community where things are happening.
- Education and collaboration among all citizens combined with strong leadership will increase community spirit and awareness.
- Restored buildings will house thriving businesses with every storefront filled.
- More people will be strolling and shopping in the clean and well-lit downtown.
- Growth from new West Union residents, more students in the local school system and good working committees will bring more volunteers who will help ensure that our downtown is an exciting place to work, find information, shop, live and have fun.
- Our revitalized town will be a place where people love to go and want to return.

CITY OF WEST UNION STORM DRAIN SYSTEM

III. First Principles to Achieve West Union's Vision

1. Collaborative Process
    - Work together to create great public and private space that serves the community.
    - Incorporate West Union's committed leadership and their local knowledge with an experienced team of professionals.
    - Realize West Union's green vision through an integrated planning, design, and implementation process.

2. Sustainable Community Investment
    - Maximize the economic value, ecological performance, and energy efficiency of every surface, element, resource, and material in West Union.
    - Deploy cost effective, multiple-benefit, multiple-purpose improvements with durable, lasting techniques and materials.
    - Invest in energy efficient structures and systems with a greater reliance on renewable energy sources.
    - Ensure resource-efficient implementation and operations/maintenance.
    - Secure a wide range of support and supplemental funding through a wholly integrated green approach.

3. Great Setting for Local Business
    - Develop the public realm in a way that is supportive of shops, restaurants, and other local businesses and commerce located in West Union.
    - Prioritize pedestrian safety, comfort, and enjoyment.
    - Ensure each business and amenity is accessible to all.
    - Provide ample seating.

4. Healthy Natural Environment
    - Incorporate natural systems to enhance all public space.
    - Integrate healthy water, trees and ornamental plantings to all places.
    - Treat all water as a valuable resource; incorporate rainwater into the public realm in a visible way.
    - Plan public spaces to be used for a variety of community activities.

5. Beauty Crafted into West Union

- Make all infrastructure and amenities both functional and beautiful expressions of West Union so that it endures.
- Nurture a guild of local artists and craftsmen to craft beautiful, durable infrastructure to serve the community.
- Develop “complete streets” that provide transportation options and full accessibility for all uses and citizens in a beautiful way.

6. Vibrant Economy for Northeast Iowa

- Cultivate local enterprise, art, and craftsmanship to support and enhance the economy of Northeast Iowa.
- Create an economically diverse, sustainable commercial district where goods and services are available in the community, with an emphasis on locally grown and produced products.

7. West Union’s Unique Context

- Enhance awareness and appreciation for West Union’s unique natural and cultural history.
- Integrate public art, water, landscape, buildings and infrastructure with cultural references in a way that help’s preserve and interpret the community’s rich heritage.
- Reinforce the West Union’s character and sense of place.
- Connect with Northeast Iowa’s regional trail infrastructure.

8. Inspiration through Education

- Educate about sustainable community living through practical demonstration.
- Inspire all residents- individuals, families, youth, and seniors- and enfranchise them in West Union through the renewal of the community.

IV. Process for Success

The vision for West Union set forth by the community is much more than a set of streetscape components. Rather, it is a wholly integrated design program for the entire public realm that is informed by the most current sustainable practice and that honors the history and culture of West Union. There is only one way to produce the desired qualities articulated in this report, and to achieve the greatest value and effectiveness of these concepts. It is accomplished through the combination of:

-A committed sponsor,

-An experienced team of professionals,

-An integrated, collaborative design process, and

-Implementation by skilled local artisans and craftsmen

A Committed Sponsor

Successful realization of sustainable practice requires strong support from those who will make decisions throughout the process and by the constituents they represent. The leadership of West Union has demonstrated a firm commitment to the pursuit of the most sustainable, long-term solutions for the community. West Union's adopted mission and vision statements exemplify the communities desire to achieve a highly desirable, sustainable public realm as an essential element to the community.

An Experienced Team of Professionals

In order to develop high-performance green infrastructure, a team of qualified professionals well-versed in sustainable practice is enlisted from concept through implementation of the project. These practitioners will work as a collaborative team in concert with the community to develop the plan in a way that optimizes the whole, rather than individual components. These include:

- *Civil Engineer*
- *Landscape Architect,*
- *Urban Planner,*
- *Architect,*
- *Energy Engineer,*
- *Traffic Engineer,*
- *Lighting Engineer,*
- *IT Engineer,*
- *Artist,*
- *Wayfinding Graphic Designer,*
- *Ecologist, and*
- *Retail Specialist.*

These professionals, trained and experienced in sustainable practice, augmented with strong local knowledge, come together and work in concert with the community.

An Integrated, Collaborative Design Process

All of the critical professional disciplines are included in the design dialogue throughout the project process, which generally includes:

- *conceptual planning;*
- *schematic design and preliminary costing;*
- *design development, preliminary engineering, pricing and funding;*
- *construction documentation, final engineering, and permitting; and*
- *construction administration, implementation, and commissioning.*

Regular planning and design workshops are conducted to bring the disciplines together to work out solutions simultaneously, and to enlist community leaders and stakeholders in decisions to be made throughout the process. Although such a design and construction process can have a greater upfront, one-time, cost than the typical process, it is the only way to achieve the best long-term value in the creation of a place as is envisioned for West Union's Main Street redevelopment program and all future community initiatives.

Implementation by Skilled Local Artisans and Craftsmen

One of the qualities emphasized in West Union's vision is the expression of the community's history, cultural, and natural beauty in the town infrastructure. This is accomplished through the engagement of artists and graphic designers during the design process, and the enlistment of skilled local craftsmen to implement certain elements of the public improvements. This is the aspect of the process that assures West Union's community improvements will create the greatest value, reinforce an authentic sense of local character, and be most appropriate for West Union.

V. Build upon Existing Planning Efforts

Considerable effort has already been put forth to articulate and conceptualize a public improvement initiative that was well underway when IDED first approached West Union about the potential to become a model pilot community. Conceptual plans for streetscape enhancements done in concert with urgently needed street and sidewalk replacement and utility upgrades were developed, priced, and communicated to the community over the past two years by Main Street West Union and TeKippe Engineering, a West Union-based civil engineering firm. Many of the fundamental issues associated with a project of this nature have already been addressed in this previous effort. This green vision builds upon the foundation laid in that effort, as well as two other initiatives led by IDED:

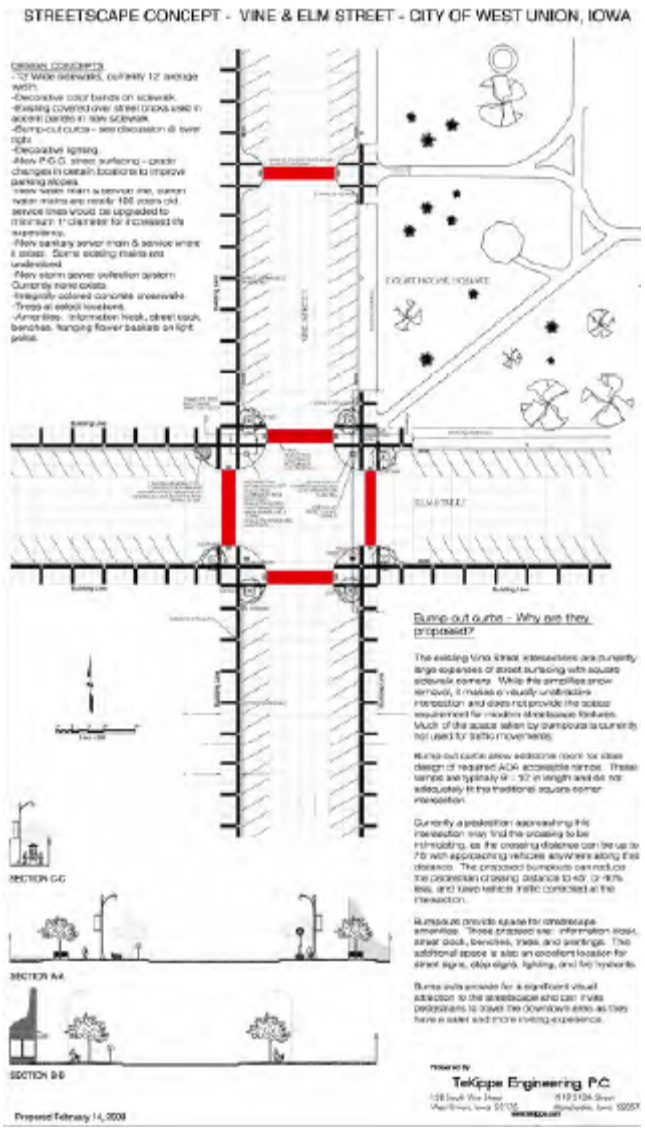
Façade Renovation Studies- Many of the buildings on Vine Street, around the courthouse square, and elsewhere in downtown are original historic structures that give a wonderful context and character to West Union's downtown. Over the years, the façades have been modified and in some cases partially or fully obscured by other materials. IDED has provided façade restoration studies for a number of these buildings to return them to their original, historically appropriate but functional condition. Some of the buildings have already been renovated according to these recommendations. The sustainable vision outlined in this report anticipates the careful integration of energy-saving enhancements as well, such as better glazing, insulation, and updated mechanical systems, in concert with other sustainable practices.

Downtown Streetscape Initiative- In October of last year, IDED's Main Street Iowa and the Iowa Downtown Resource Center completed a Technical Assistance Visit, which included a workshop and summary report, to advise West Union about the potential for multi-purpose, multi-benefit pedestrian-scale streetscape improvements. The results of this effort were summarized in the report "Downtown Streetscape: Where are we? What do we need? What do we want?"

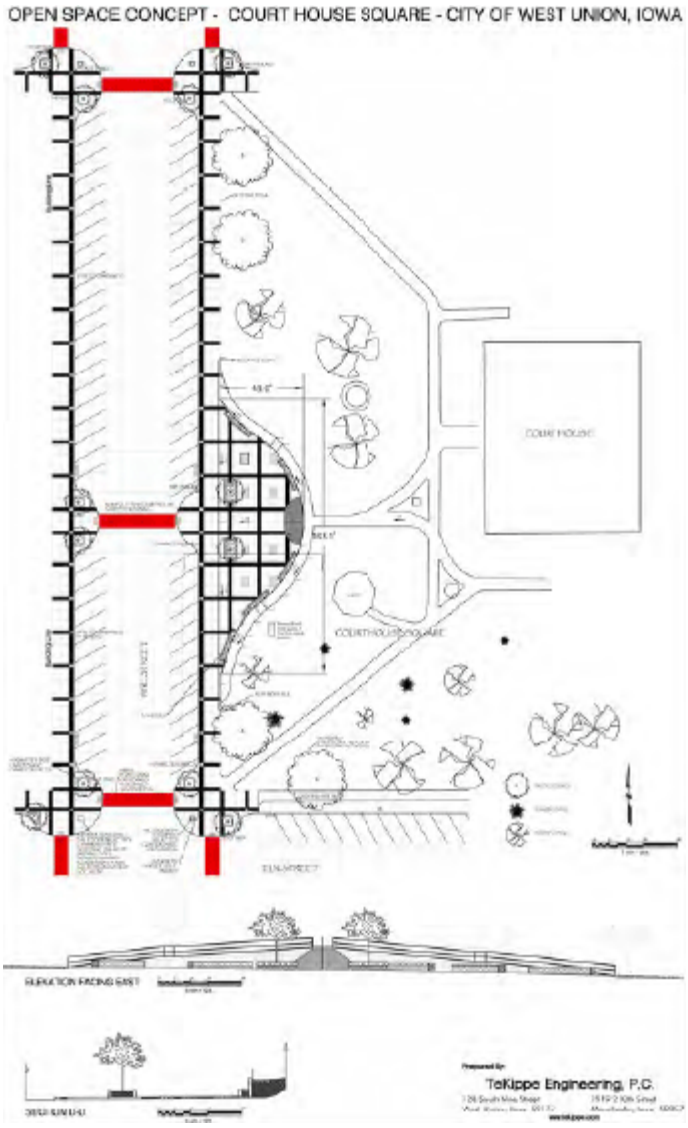
Illustrations from the TeKippe streetscape plans follow, and the other information is available through IDED and the City of West Union.

STREETSCAPE CONCEPT
FOR THE
CITY OF WEST UNION

STREETSCAPE CONCEPT
FOR THE
CITY OF WEST UNION
VINE & ELM STREET



STREETSCAPE CONCEPT
FOR THE
CITY OF WEST UNION
COURT HOUSE SQUARE



VI. Integrated Community Elements

During the visioning workshop, a number of *desirable community elements*, or components of a sustainable streetscape, were presented, discussed, and prioritized. A list of top priorities and strategies emerged from the dozens of ideas discussed. The following ten areas represent the consensus of the group with respect to those community elements most essential to West Union's successful green infrastructure initiative:

1. Optimal Street Design and Dimensions

- Pavement Width - two driving lanes with center "flexible" lane for parking, standing, deliveries, snow storage, etc.
- Snow removal - consider snow melt system using renewable energy sources (see Appendix i for more information)
- Accommodate bicycles - bike lanes and storage

Snowmelt system, downtown Holland, MI

Bicycle Rack (and dog leash holder!)

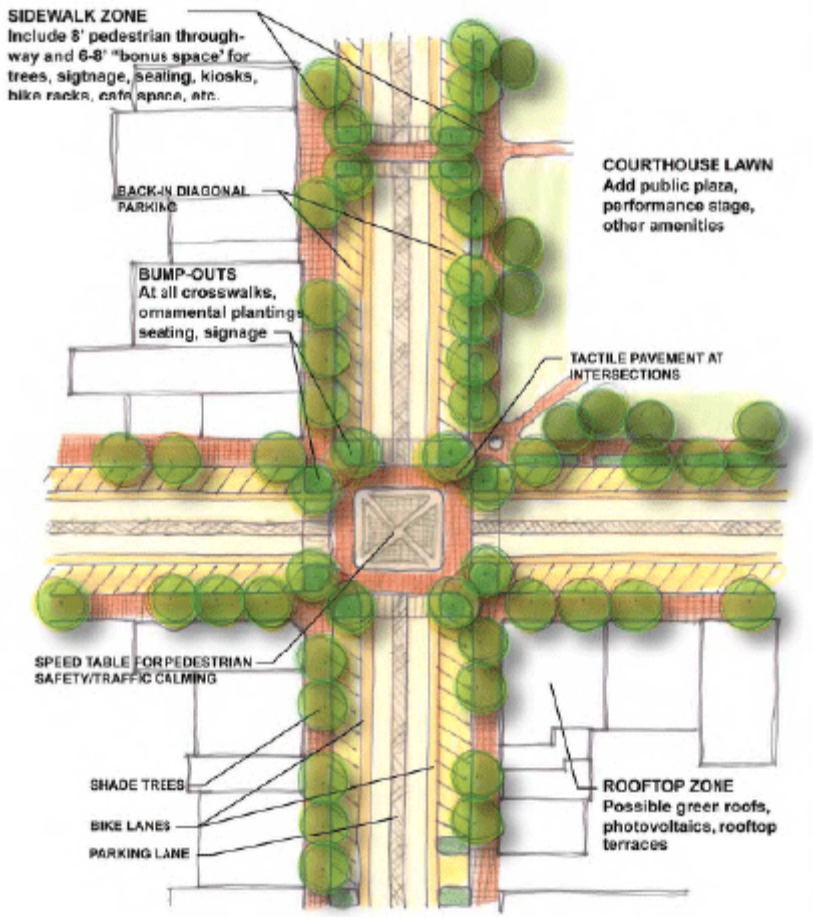
2. Parking/Access

• Parking - angled parking along outside edges - consider back-in diagonal parking for safety *(see Appendix iv or more information)*

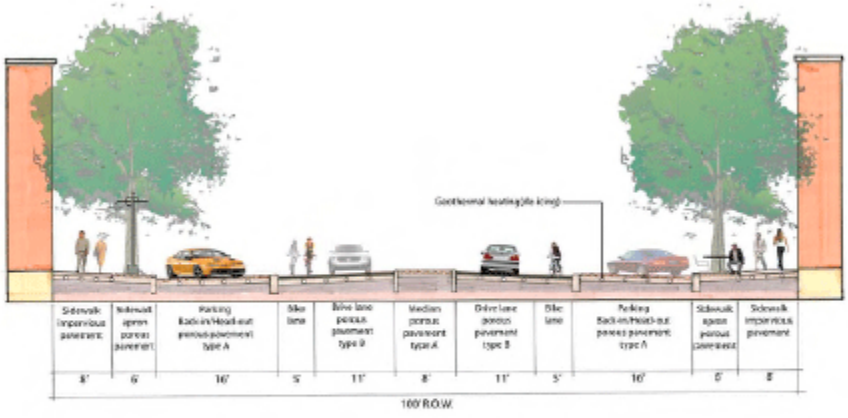
• Pursue off-street parking opportunities and parking management to maximize patron convenience

Back-in angled parking

Parking management signage



Green Street Concept
Typical Intersection
Plan View



Green Street Concept - Typical Block
Cross Section View

3. Pedestrian Safety and Comfort

- Crosswalks clearly delineated at intersections and mid-block
- Consider speed tables for traffic calming
- Add bump-outs at all mid-block locations
- Trees/shading; perform solar study to determine optimal solutions

Tree planters allow surface drainage from the entire sidewalk to provide rainwater for the trees

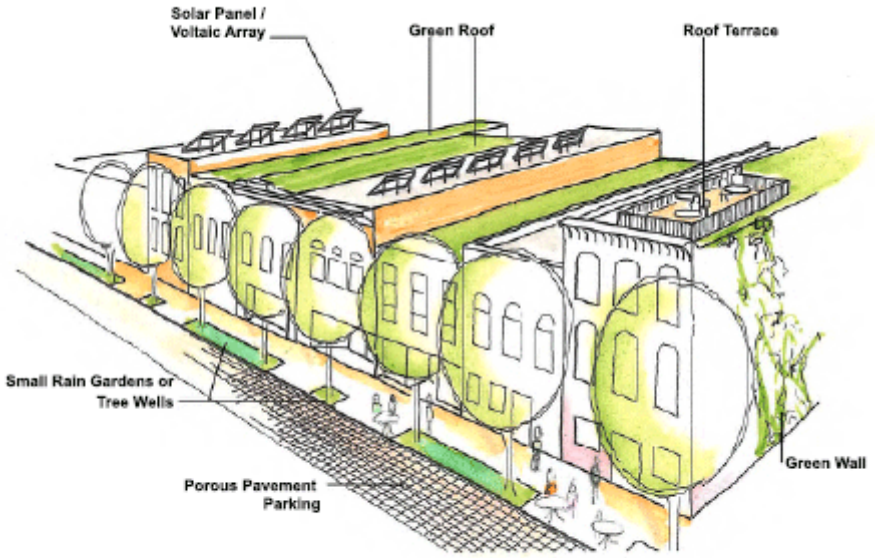
Speed table/elevated crosswalk for traffic calming and pedestrian safety

4. Water

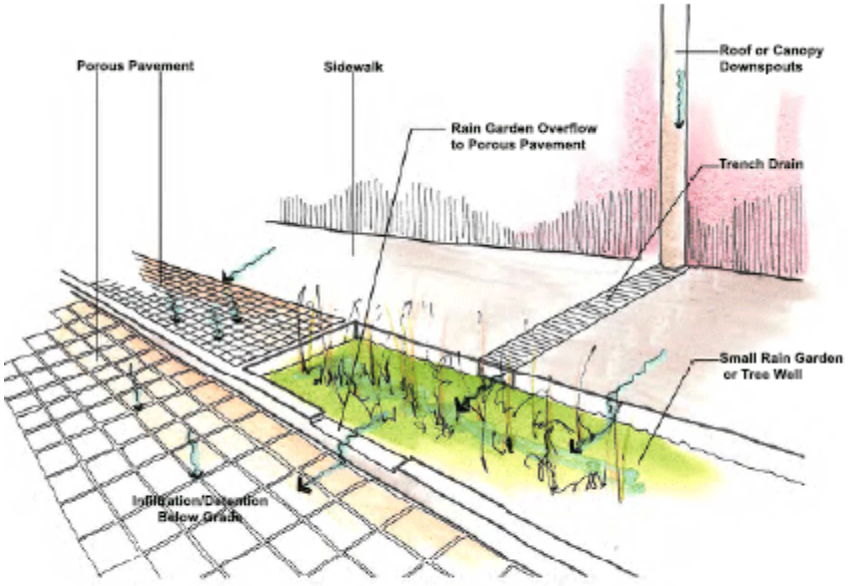
- Integrate porous pavement unit pavers *(see Appendix i for more information)*
- Rainwater harvesting and re-use *(see Appendix i for more information)*
- Rain gardens/bioswales *(see Appendix i for more information)*

Interlocking concrete porous pavement system with integrated bioswales, Josey Heights neighborhood, Milwaukee, WI

Streetside Bioswale, Portland, OR



Green Street Concept - Typical Block Perspective View



Green Street Concept - Rainwater Detail Perspective View

5. Energy/Communications Infrastructure

- Geo-thermal loop to serve entire square
- Conduit for communications (fiber optic?)
- Wireless system
- Energy audit for local businesses and property owners

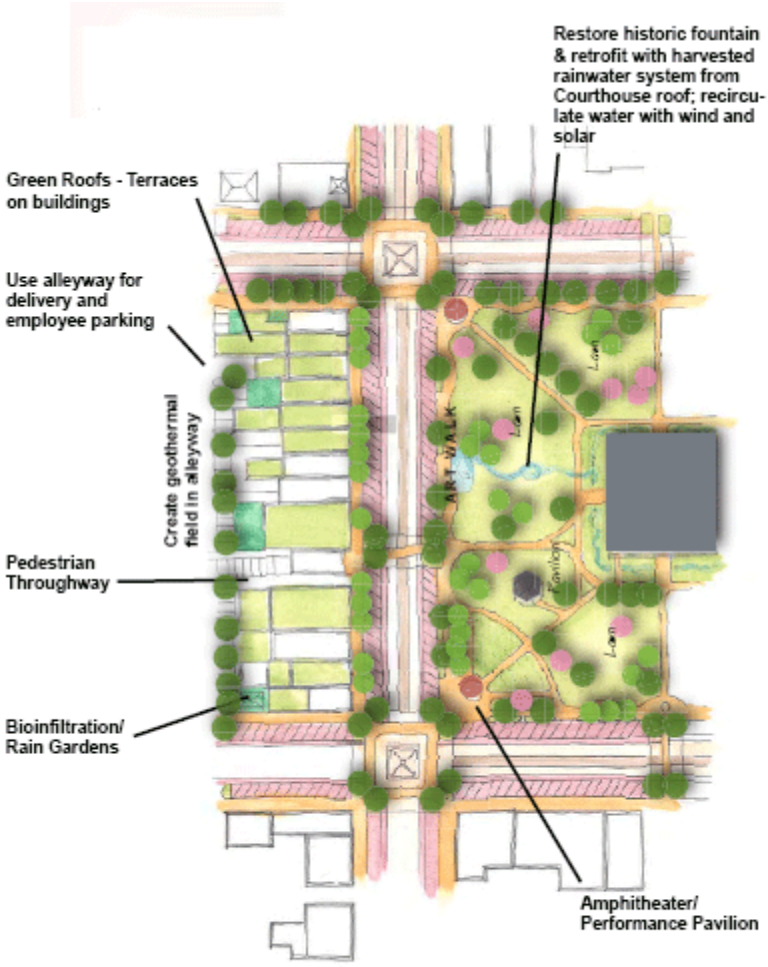
6. Street Lighting

- Utilize energy efficient, pedestrian-scaled lighting standards *(see Appendix i for more information)*
- Adapt lighting design to maximize safety and minimize light pollution, glare, and non-renewable energy use

Solar-powered lighting fixtures

7. Public Art

- Integrate art into the streetscape in a variety of ways
- Use art to tell the story of West Union's past, present, and future
- Craft unique street furnishings and amenities with local artists and craftsmen



Green Street Concept - Court House Square

Plan View

8. Recreation Options

- Multi-use bicycle lane/trail connections into town square
- Utilize the courthouse lawn as public space

9. Communications

- Develop and implement community communications strategy

(see Section VIII- Communications in this report)

10. Implementation/Funding

- Pursue range of support/funding opportunities

VII. Additional Concepts from Brainstorming Exercise

The visioning workshop included breakout sessions where the participants divided into four small groups to discuss and apply various sustainable strategies to different sections of West Union's downtown public street renovation project as a way to further distill, prioritize, and adapt the concepts presented by the professional team earlier in the workshop. The following list includes all of the suggestions and ideas that emerged from that exercise. All of the ideas and applications have merit; the next step in the process (as described later in this summary report) is to evolve the design for the streetscape project informed by all of these concepts and to incorporate them into a complete, integrated design.

Group 1

1. *Center Lane, raised, porous… alt material*
2. *Porous stalls*
3. *Impervious sidewalks to street, water proof, insulate basements*
4. *Kaleidoscope sculpture (from Clairmont)*
5. *West sun on east sidewalk (outside seating)*
6. *Snow plowing, plow sidewalks, plow to center*
7. *Lighting, pedestrian scale, street scale, LED, PV, plug ins*
8. *Park around Court House, terrace with usable space for restaurant seating and stormwater treatment*
9. *Brew pub with beer garden*
10. *Sidewalk art (i.e. dance steps)*
11. *Trail from downtown to Recreation center/school, Echo valley…*
12. *Geothermal field for Court House, and under Vine street for businesses*
13. *More I&E / outreach… involvement of the community*
14. *Clock*
15. *Better pedestrian crossings*
16. *Alley project – permeable*
17. *Roof gardens / solar collectors*

Group 2

18. *Salt and sand free environment, geothermal snow melt system, permeable pavement*
19. *Eliminate big trucks from Vine and Elm street but accommodate deliveries in overall plan*
20. *Move school buses, utilize space as parking, retail*
21. *Parking garden for runoff from Vine street*
22. *Turn brownfield site into parking garden, farmers market*
23. *Bike lane (golf cart) in center of street (10')*
24. *Increase pedestrian traffic in gathering places*
25. *Revamp roofs to include water collection, solar , green roofs*
26. *Wider distribution of electrical outlets throughout the courthouse square*
27. *Blvd of trees in the middle of the street (raingardens, designated truck*
28. *Bicycle parking and lanes*
29. *Additional bump-outs on south side of courthouse*
30. *Additional handicap parking near DHS and other places throughout the square*
31. *Walkway to brownfield parking lot*
32. *Trees on build out and along sidewalk*
33. *Plaza on courthouse lawn for entertainment*
34. *Round about mini park in intersection*
35. *Climbing wall on back of building with supervision*
36. *Hanging flower baskets on street lights*

Group 3

37. *Porous pavement system with snow melt system*
38. *Incorporate history block*
39. *Buy bricks to memorialize family*
40. *Original paver stone usage*
41. *Incorporate artist design with colored block of cement*
42. *Logo branding iron in cement or block*
43. *Kiosk with green roof cover*
44. *Videotape when green measures are being utilized and sent to west union to consider*
45. *Green roof / roof garden, outdoor areas / rooftop use*
46. *Rain gardens at downspout areas of courthouse*
47. *Rollerblades welcome area (dirt bikes), kids area by middle school*
48. *Geothermal /solar applications for businesses and courthouse*
49. *Water fountains – human powered*
50. *Utilize kids comments and how they can be incorporated*
51. *Rainwater harvesting and re-use*
    a. *Lush landscapes*
    b. *Water hanging baskets*
    c. *Gray water flushing*
    d. *Fountains*
52. *Awning on businesses*
53. *Street lights LED, solar wind powered*
54. *Target light where needed*
55. *Motion lights near high vandalism*
56. *Public restrooms, solar powered, rainwater flushed*
57. *Community bike swipe ands system*
58. *Kaleidoscope art influence*
59. *Cow sculpture around the business square*
60. *Outdoor tables for card playing under trees*
61. *WIFI*
62. *Coffee shop*
63. *Guitar hero night / talent night for kids*

Group 4

64. *Add sidewalks around courthouse in plan*
65. *Gateway off Hwy 18*
66. *Marked crosswalk for pedestrians (raised walkways)*
67. *Green roof on school / courthouse / downtown buildings*
68. *Solar panels on courthouse*
69. *Courthouse old jail – permeable parking and rain garden on courthouse square*
70. *Theater in southwest corner of courthouse square*
71. *Design in pavement on center intersection Elm/Vine*
72. *Raised cross walks*
73. *Piping for geothermal*
74. *Garden at Library for sewer run off*
75. *Light fixture middle of street*
76. *Outdoor sound system*
77. *Outdoor film/movie screen (wall of building)*
78. *Multipurpose presentation stage (outdoors)*
79. *Deck on the gazebo for presentations/ equipment*
80. *Terraced amphitheatre or bowel area*
81. *Recycling system / area in an artistic area to lead to community wide recycling system*
82. *Make the downtown walkable*
83. *Any new development provide walkable access to downtown*
84. *Change city policies to require green measures*
85. *Mandate community service – use for green measures*
86. *Make back entrances/areas more desirable and customer friendly so front door can be welcoming*

VIII. Communication

In order to successfully conceive and implement a sustainable community vision as articulated in this document, appropriate methods and timing of communication is critical throughout the entire process. A portion of the workshop was devoted to the establishment of the basic philosophy, purpose, and approach towards effective communication:

Objectives of the Communications Strategy

The objective of a "Communications Strategy" is to ensure all stakeholders are aware of, participate in, and plan for the development of the West Union "Streetscapes Program" (WU – Program).

Successful communication strategies help ensure a positive dialogue by providing access to all pertinent data, demonstrating a willingness by project leaders and stakeholders to hear all relevant perspectives, maintaining a consistent voice and identity from the project's leadership, and showing an ongoing commitment to place the communities' long-term best interests as its highest priority.

The best way to approach communication is to develop, publish and then stay with a clear plan. The level of engagement and ultimately the success of the project will be directly linked to the appropriateness and timing of disseminated information. An effective communication strategy requires both the personal commitment of the project's leadership and appropriate financial resources.

A Communication Strategy will:

- Identify all stakeholders and their communication needs;

- Outline methods and medium(s) of communication that meet these needs most effectively;

- Promote and maintain stakeholder engagement by identifying methods and tools that raise awareness of the project and its benefits;

- Manage expectations of all stakeholders;

- Provide timely project updates to all relevant stakeholders;

- Provide mechanisms for stakeholders to find information;

- Minimize the project risks through the provision of useful information to all stakeholders.

Communication Mediums:

The following is a list of communication media that will be used to distribute messages and information about the project.

- Online: All relevant reports, timelines and recommendations should be posted here. The website is dynamic and constantly updated and must reflect the project's potential, its progress, and the enthusiasm shared by local leadership. An appropriate financial commitment is necessary.

- E-mail: Allows the project to generate an ongoing educational process with the stakeholder group while encouraging them to monitor the web site for timely information and opportunities to maintain engagement.

- Forums: Includes briefings, workshops and discussions groups.

- Public Meetings: Periodic meetings will provide a critical forum for the sharing of information (and decision making) on the project.

- Reports: Periodic reports developed for internal review are also critical to the sharing of information among the project's governance structure.

Communication Messages:

The management of expectations forms an important part of all communications. The key messages about the project must maintain the interest of the stakeholders and resolve their concerns/questions. The key messages communicated to stakeholders should include:

- Basic rationale for the project
- Historical context
- Work done to date;
- All participants engaged in the project;
- Needs of the stakeholders;
- Expected benefits, opportunities and outcomes from the project;
- The timing of significant milestones;
- Opportunities for stakeholder input;
- Other...

Key messages will need to be adapted for each target audience and each stage of the project.

Key Stakeholders:

(categories include: government, business, civic leadership, education, citizens' organizations...)

The following typical forms can assist gathering and organizing stakeholder information:

West Union Stakeholders

Government:

Business:

Civic Leadership:

Education:

Citizens/organizations:

Other…

Stakeholders Analysis:

Group purpose/goal	Involvement	Communication

Communications Evaluation:

It is critical to the success of the WU project that timely and relevant information is disseminated to stakeholders. Therefore, it is important that the effectiveness of the activities undertaken is measured and recorded. Regular assessment will not only ensure a timely evaluation of communication progress and its success, but it provides the necessary information from which to modify, update or change any aspect of the program. The evaluation tool is dynamic and should be integrated into the projects overall master plan. Evaluation should be conducted with as much impartiality as possible. The team conducting the evaluation should seek information from a variety of sources.

Group	Medium	Proposed Outcome	Time/date	Effectiveness

IX. Implementation/Resources

One of the primary benefits to an integrated green infrastructure approach as envisioned by West Union is the multitude of resources available to augment the Cities' capital budget for implementation. During the workshop, an extensive list of potential grants and other funding sources were identified for projects (such as West Union's) that exemplify a fully integrated, high performance green pilot. One of the reasons so much support is available is the critical need to get green street projects successfully implemented, monitored, and communicated throughout the state of Iowa - and beyond. The funding resources identified in the workshop are listed below, and there are likely other resources available as well:

Organization	Alliant Energy
Grant Title	Business Rebates and Incentives
Website:	
http://www.alliantenergy.com/docs/groups/public/documents/pub/p012467.hcsp	
Application Deadline	
Contact Name	
Contact Email	
Contact Phone	

Organization	Alliant Energy
Grant Title	ReLeaf
Website:	
http://www.alliantenergy.com/docs/groups/public/documents/pub/p014352.hcsp	
Application Deadline	None
Contact Name	Jessica Flatt
Contact Email	Jessica.Flatt@dnr.iowa.gov
Contact Phone	515-281-6749

Organization	Alpine Communications
Grant Title	Charitable Giving Program
Website:	
http://alpinecom.net/index.php?option=com_content&task=view&id=41&Itemid=64	
Application Deadline	August 31st or November 30th 2008
Contact Name	
Contact Email	
Contact Phone	563-245-4000

Organization	Aquilla Energy
Grant Title	Programs for Commercial Sector
Website:	
http://www.aquila.com/services/programs/business-custrebate.php	
Application Deadline	
Contact Name	
Contact Email	
Contact Phone	800-303-0752

Organization	Carver Trust
Grant Title	
Website:	
https://www.carvertrust.org/	
Application Deadline	August 15 2008
Contact Name	
Contact Email	info@carvertrust.org
Contact Phone	563-263-1547

Organization	DNR
Grant Title	Energy Bank
Website:	
http://www.iowadnr.gov/energy/ebank/index.html	
Application Deadline	None
Contact Name	Lee Vannoy and Mike Adams
Contact Email	Lee.Vannoy@dnr.state.ia.us and Michael.Adams@dnr.state.ia.us
Contact Phone	515-281-6559 and 515-281-4262

Organization	DNR
Grant Title	Resource Enhancement and Protection - City Parks and Open Space
Website:	
http://www.iowadnr.gov/reap/cityopen.html	
Application Deadline	August 15, 2008
Contact Name	Ross Harrison
Contact Email	Ross.Harrison@dnr.iowa.gov
Contact Phone	515-281-5973

Organization	DNR
Grant Title	Resource Enhancement and Protection - Conservation Education
Website:	
http://www.iowadnr.gov/reap/cep.html	
Application Deadline	November 1 2008
Contact Name	Susan Salterberg
Contact Email	Salterberg@uni.edu
Contact Phone	

Organization	DNR
Grant Title	Resource Enhancement and Protection - Open Space Acquisition and Development
Website:	
http://www.iowadnr.gov/reap/open.html	
Application Deadline	August 15, 2008
Contact Name	Ross Harrison
Contact Email	Ross.Harrison@dnr.iowa.gov
Contact Phone	515-281-5973

Organization	DNR
Grant Title	Resource Enhancement and Protection - Roadside Vegetation
Website:	
http://www.iowadnr.gov/reap/roadside.html	
Application Deadline	August 21, 2008
Contact Name	Ross Harrison
Contact Email	Ross.Harrison@dnr.iowa.gov
Contact Phone	515-281-5973

Organization	DNR
Grant Title	Resource Enhancement and Protection - Soil and Water Enhancement
Website:	
http://www.iowadnr.gov/reap/soilwater.html	
Application Deadline	Not Available
Contact Name	Jim Gillespie and Bill McGill
Contact Email	
Contact Phone	515-281-7043 and 515-281-6148

Organization	DNR
Grant Title	Solid Waste Alternatives Program
Website:	
http://www.iowadnr.com/waste/financial/financialswap.html	
Application Deadline	October 1, 2008
Contact Name	Tom Anderson
Contact Email	Tom.Anderson@dnr.iowa.gov
Contact Phone	515-281-8623

Organization	DNR
Grant Title	State Revolving Fund - Clean Water
Website:	
http://www.iowadnr.com/water/wastewater/potw.html	
Application Deadline	Not Available
Contact Name	Patti Cale-Finnegan and Lori Beary
Contact Email	Patti.Cale-Finnegan@dnr.iowa.gov and Lori.beary@iowa.gov
Contact Phone	515-725-0498 and 800-432-7320

Organization	DNR
Grant Title	State Revolving Fund - Iowa's Drinking Water
Website:	
http://www.iowadnr.com/water/drinking/srf.html	
Application Deadline	Not Available
Contact Name	Jennifer Bunton
Contact Email	Jennifer.Bunton@dnr.iowa.gov
Contact Phone	515-725-0298

Organization	DNR
Grant Title	State Revolving Fund - Non-Point Source Program
Website:	
http://www.iowadnr.gov/water/srf/nonpoint.html	
Application Deadline	Not Available
Contact Name	Patti Cale-Finnegan
Contact Email	Patti.Cale-Finnegan@dnr.iowa.gov
Contact Phone	515-725-0498

Organization	DNR
Grant Title	State Revolving Fund - Onsite Wastewater Systems Assistance Program
Website:	
http://www.iowadnr.com/water/srf/onsite.html	
Application Deadline	Not Available
Contact Name	Dan Olson
Contact Email	Daniel.Olson@dnr.iowa.gov
Contact Phone	515-281-8263

Organization	DOE
Grant Title	Enhanced Geothermal Systems Research, Development, and Demonstration
Website:	
https://e-center.doe.gov/iips/faopor.nsf/UNID/C6AC09127A4B508B8525746C005F950D?OpenDocument	
Application Deadline	August 12, 2008
Contact Name	James Damm
Contact Email	go.geothermal@go.doe.gov
Contact Phone	303-275-4783

Organization	DOE
Grant Title	Loan Guarantee Solicitation for Innovative Energy Efficiency, Renewable Energy and Advanced Transmission and Distribution Technologies
Website:	
http://www.lgprogram.energy.gov/EERenewableSolicitation.pdf	
Application Deadline	December 31, 2008
Contact Name	Amy Sauer
Contact Email	asauer@eesi.org
Contact Phone	202-662-1892

Organization	DOT
Grant Title	Living Roadways Trust Fund
Website:	
http://www.iowalivingroadway.com/	
Application Deadline	August 31 2008
Contact Name	Steve Holland
Contact Email	Steven.Holland@dot.iowa.gov
Contact Phone	515-239-1768

Organization	DOT
Grant Title	Federal Recreational Trails Fund
Website:	
http://www.sysplan.dot.state.ia.us/fedstate_rectrails.htm	
Application Deadline	October 1, 2008
Contact Name	Office of Systems Planning
Contact Email	
Contact Phone	515-239-1337

Organization	DOT
Grant Title	Safe Routes to School
Website:	
http://www.dot.state.ia.us/saferoutes/	
Application Deadline	October 1, 2008
Contact Name	Kathy Ridnour
Contact Email	Kathy.Ridnour@dot.iowa.gov
Contact Phone	515-239-1713

Organization	EDA
Grant Title	Investments for Public Works and Economic Development Facilities
Website:	
http://12.46.245.173/pls/portal30/CATALOG.PROGRAM_TEXT_RPT.SHOW?p_arg_names=prog_nbr&p_arg_values=11.300	
Application Deadline	None
Contact Name	
Contact Email	
Contact Phone	

Organization	EPA
Grant Title	Broad Agency Announcement for Conferences, Workshops and/or Meetings
Website:	
http://es.epa.gov/ncer/rfa/2008/2008_baa.html#AWARDII	
Application Deadline	December 9, 2008
Contact Name	Bernice Smith and Thomas O'Farrell
Contact Email	Smith.Bernicel@epa.gov and O'Farrell.Thomas@epa.gov
Contact Phone	202-343-9766 and 202-343-9639

Organization	IDALS
Grant Title	Watershed Protection Program
Website:	
http://www.iowaagriculture.gov/waterResources/watershedProtection.asp	
Application Deadline	July 1, 2008
Contact Name	Mike Franklin
Contact Email	
Contact Phone	515-281-6145

Organization	IDED
Grant Title	Brownfield Site Redevelopment Program
Website:	
http://www.iowalifechanging.com/business/brownfields.html	
Application Deadline	Not Available
Contact Name	Matt Rassmussen
Contact Email	brownfields@iowalifechanging.com
Contact Phone	515-242-4906

Organization	IDED
Grant Title	Community Attraction and Tourism Program
Website:	
http://www.visioniowa.org/cat.html	
Application Deadline	July 15 and October 15 2008
Contact Name	Alaina Santizo
Contact Email	Alaina.Santizo@iowalifechanging.com
Contact Phone	515-242-4827

Organization	IDED
Grant Title	Green Streets
Website:	
http://www.iowalifechanging.com/community/	
Application Deadline	
Contact Name	
Contact Email	community@iowalifechanging.com
Contact Phone	

Organization	IDED
Grant Title	Public Facilities Fund
Website:	
http://www.iowalifechanging.com/community/community/public.html	
Application Deadline	Not Available
Contact Name	
Contact Email	cdbg@iowalifechanging.com
Contact Phone	515-242-4836

Organization	Iowa Arts Council
Grant Title	Public Art Grants
Website:	
http://www.iowaartscouncil.org/funding/public-art-project-grant/index.shtml?id=2	
Application Deadline	October 1, 2008
Contact Name	Bruce Williams
Contact Email	Bruce.Williams@iowa.gov
Contact Phone	515-281-4006

Organization	Iowa Energy Center
Grant Title	Alternate Energy Revolving Loan Program
Website:	
http://www.energy.iastate.edu/AERLP/index.htm	
Application Deadline	July 31, 2008
Contact Name	
Contact Email	iec@energy.iastate.edu
Contact Phone	515-294-8819

Organization	Keep Iowa Beautiful
Grant Title	Paint Iowa Beautiful Program
Website:	
http://www.keepiowabeautiful.com/paintIowa.html	
Application Deadline	February 28, 2009
Contact Name	Gerry Schnepf
Contact Email	gschnepf@keepiowabeautiful.com
Contact Phone	515-323-6507

Organization	Kellogg Foundation
Grant Title	Food and Fitness Program
Website:	
http://www.wkkf.org/default.aspx?tabid=75&CID=383&NID=61&LanguageID=0	
Application Deadline	Not Available
Contact Name	
Contact Email	
Contact Phone	

Organization	Kresge Foundation
Grant Title	Green Building Initiative
Website:	
http://www.kresge.org/content/displaycontent.aspx?CID=106	
Application Deadline	Not Available
Contact Name	
Contact Email	info@kresge.org
Contact Phone	248-643-9630

Organization	McElroy Trust
Grant Title	
Website:	
http://www.mcelroytrust.org/	
Application Deadline	September 1 and December 1 2008
Contact Name	Stacy Van Gorp
Contact Email	vangorp@mcelroytrust.org
Contact Phone	319-287-9102

Organization	Qwest Foundation
Grant Title	
Website:	
http://www.qwest.com/about/company/community/foundation/index.html	
Application Deadline	None
Contact Name	
Contact Email	qwest.foundation@qwest.com
Contact Phone	

Organization	Trees Forever
Grant Title	Iowa's Living Roadways Program
Website:	
http://www.treesforever.org/content.asp?ID=2130	
Application Deadline	November 15, 2008
Contact Name	Meredith Borchardt
Contact Email	mborchardt@treesforever.org
Contact Phone	800-369-1269

Organization	USDA
Grant Title	Community Facilities Program
Website:	
http://www.rurdev.usda.gov/rhs/cf/brief_cp_grant.htm	
Application Deadline	
Contact Name	
Contact Email	
Contact Phone	319-352-1715

Organization	USDA
Grant Title	Renewable Energy Systems and Energy Efficiency Improvements Programs
Website:	
http://www.rurdev.usda.gov/ia/rbcs_RE-EE_Section_9006.html	
Application Deadline	Not Available
Contact Name	
Contact Email	
Contact Phone	319-352-1715
Note: these guidelines are being revised into the new section 9007 programs soon	

Organization	USDA
Grant Title	Rural Business Enterprise Grants
Website:	
http://www.rurdev.usda.gov/ia/rbs.html#rbg	
Application Deadline	Not Available
Contact Name	
Contact Email	
Contact Phone	319-352-1715

Organization	USDA
Grant Title	Rural Business Opportunity Grants
Website:	
http://www.rurdev.usda.gov/ia/rbs.html#rbg	
Application Deadline	
Contact Name	
Contact Email	
Contact Phone	319-352-1715

Organization	USDA
Grant Title	Rural Cooperative Development Grants
Website:	
http://www.rurdev.usda.gov/ia/rbs.html#rbg	
Application Deadline	Not Available
Contact Name	
Contact Email	
Contact Phone	319-352-1715

Organization	USDA
Grant Title	Rural Economic Development Grant
Website:	
http://www.rurdev.usda.gov/ia/rbs.html#rbg	
Application Deadline	Not Available
Contact Name	
Contact Email	
Contact Phone	319-352-1715

Organization	USDA
Grant Title	Rural Economic Development Loan
Website:	
http://www.rurdev.usda.gov/ia/rbcs_REDL_Fact_Sheet.pdf	
Application Deadline	Not Available
Contact Name	
Contact Email	
Contact Phone	319-352-1715

Organization	USDA
Grant Title	Solid Waste Management Grants
Website:	
http://www.usda.gov/rus/water/SWMG.htm	
Application Deadline	Not Available
Contact Name	LaVonda Pernell
Contact Email	lavonda.pernell@wdc.usda.gov
Contact Phone	202-720-9635

Organization	Wellmark Foundation
Grant Title	Childhood Obesity Prevention and Community-Based Wellness and Prevention
Website:	
http://www.wellmark.com/foundation/apply/apply_for_funding.htm	
Application Deadline	September 23, 2008
Contact Name	Matt McGarvey
Contact Email	Mcgarveym@wellmark.com
Contact Phone	515-245-4819

X. Next Steps/Preliminary Budget

The next steps in the process of realizing this vision are threefold: develop specific design documents, refine cost information, and pursue funding support to achieve the initial of construction and operations phase. This entails the enlistment and collaboration of the range of professionals well versed in green practice as described earlier in this report. It also entails establishing clear lines of community dialogue, gathering input at appropriate times, and continuing to build support and enthusiasm within the West Union community and through the state and federal agencies and foundations who will help make this dream a reality.

Following is a brief outline of an integrated planning and design process that will articulate the vision in tangible plan documents and construction specifications for the initial phase of construction. It includes the professional services of engineers, planners, landscape architects, artists, energy specialists, and others as described in Section IV:

Design Process

The development of specific design documents involves the preparation of a fully integrated "schematic plan" for the design and implementation of approximately six (6) blocks of proposed street and streetscape improvements to serve as a model demonstration "Iowa Green Streets" pilot project. The conceptual plans will illustrate innovative site design, streetscape, landscape, circulation, water resource management, energy, lighting, and other infrastructure improvements that are both cost effective and ecologically sustainable, and consistent with the community-based practices and principles established throughout the visioning process. The schematic design documents will offer a preliminary illustration of the complete, innovative suite of design solutions that can be achieved in this type of integrated approach, provide an adequate level of detail to estimate preliminary project implementation costs as well as the necessary documentation to pursue funding support mechanisms, and provide the foundation for the subsequent detailed design and engineering phases of the project.

Task 1: Data Collection, Inventory, and Assessment of Proposed Study Area

Most of the data collection, inventory, and site assessment tasks have been completed previously, although some level of additional assessment will be required by project team members that have not been involved in the development of prior design and engineering efforts or the community workshop visioning process.

Task 2 – Conceptual Green Streets Design Alternatives

Following the data collection and review task, Project Team members will prepare preliminary concepts for the selected street corridors including potential improvements in the Courthouse square. The concepts will be loosely drawn sketches meant to evaluate alternative ideas. The alternatives will represent flexible development scenarios that articulate the desires expressed during the community visioning process while strengthening vitality and urban form, environmental quality, and sustainability. The concepts will illustrate potential integrated street corridor improvement opportunities including vehicular and pedestrian circulation, parking, streetscape, access, rainwater management features, hard and soft landscape elements, energy options, and utility requirements. Project Team members will provide technical assistance towards the community's understanding of proposed green infrastructure measures such as porous paving, rain gardens, bio-swales,

rainwater harvesting and re-use technologies, drought tolerant or native landscapes, and integrated energy systems.

Project Team members will participate in a planning workshop with IDED and local and state-wide stakeholders to review the design alternatives and develop a preferred consensus approach. The plan concepts will be presented for general discussion including preliminary estimates of probable construction costs. Preferred elements will be identified for inclusion in a refined Schematic Design document.

Task 3 - Schematic Design Documents

Following the review session, the Project Team will refine the plan concept as necessary. The revised concept plans will include supporting sections, elevations, and/or graphic images. For the Schematic Design Documents drafted AutoCAD plans and construction details will be prepared.

The Schematic Design Documents will illustrate the proposed integrated street, parking, streetscape, landscape, storm water, circulation, lighting, energy, and other ecological design approaches including locations and methods for innovative storm water applications, energy options, green infrastructure components, and planting systems.

Project Team members will develop an updated estimate of probable construction cost for the Schematic Design Plan.

Project Team members will review the final Schematic Design Documents with IDED and West Union community representatives, and other stakeholder groups and individuals. Appropriate next steps will be determined including a projected detailed design and implementation schedule.

Task 4 – Design Development Documents

Following the completion of the Schematic Design phase, the Project Team will prepare Design Development documents for the scope of work described above.

Task 5 – Construction Documents

Following the completion of the Design Development phase, the Project Team will prepare Construction Documents for the scope of work described above.

Task 6– Bidding & Construction Administration

Preliminary Budget

Also following is a conceptual project budget for this initial phase of redevelopment. It is based upon preliminary estimates and assumptions for street, sidewalk, utility, and lighting replacements and upgrades made by TeKippe Engineering prior to the workshop. The budget includes additional assumptions for high performance, green materials and integrated water, energy, and snow melt elements. THIS PRLIMINARY BUDGET IS VERY CONCEPTUAL IN NATURE. It is not yet informed by the potential values and cost savings associated with truly integrated design and engineering, married with calculations of offsets to long-term operating costs and other financial factors. A necessary aspect of the detailed design and implementation of this, and any, phase of the project would be a sustainable financial budget and project management plan that incorporates capital costs, operations costs, and available funding and other resources.

A. STREET SURFACE and GENERAL ITEMS
   Includes removal of existing street pavement, grading, new pavement, erosion control, and other items:
   $1,600,000 to $2,270,000

B. SIDEWALKS
   Includes removal of existing sidewalk pavement, new decorative paved surfaces, planters, and accessibility improvements:
   $450,000 to $575,000

C. AMENITIES
   Includes street clock, information kiosk, street trees, seating, signage, bicycle racks, and other street furnishings:
   $115,000 to $250,000

D. SANITARY SEWER
   Includes necessary improvements to sanitary sewer and service connections:
   $75,000

E. WATER
   Includes necessary improvements to water main and service connections:
   $325,000

F. STORM SEWER/DRAINAGE IMPROVEMENTS
   Includes necessary storm drainage structures and piping:
   $85,000 to $150,000

G. STREET LIGHTING
   Includes decorative, energy efficient street lighting and electrical service:
   $475,000 to $1,275,000

H. COURTHOUSE SQUARE COURTYARD
Includes amphitheater, fountain, and other improvements and amenities on the courthouse square site:
$125,000 to $360,000

I. SNOWMELT SYSTEM
Includes integrated snowmelt system for all paved surfaces:
$3,400,000

J. ROOFTOP ZONE
Includes sustainable improvements to rooftops of existing buildings such as photovoltaic systems, green roofs, and rooftop garden terraces (would be done on a building-by-building basis:
$750,000 to $1,500,000

OTHER PROJECT COSTS
Includes contingencies, design and engineering costs, and project administration:
$600,000 to $1,320,000

XI. Appendices

i. **Green Infrastructure Practices**

iii. **Iowa Green Communities Criteria- DRAFT**

ii. **The Economic Benefits of Walk-able Communities**

iii. **Complete Streets- Press Release and Criteria**

iv. **Back-in/Head-Out Angled Parking Summary**

Green Infrastructure Practices

Rainwater running over impervious surfaces (rooftops, streets, parking lots, alleys, and sidewalks) picks up urban pollutants such as sediment, heavy metals, and excess nutrients. The temperature of rainwater also changes, typically warming as it flows across the landscape. In West Union, this rainwater and pollutants concentrate in drainage ditches and ultimately discharge north into Glover Creek or south into Otter Creek. Both of these cold water creeks support fish and other aquatic species that are sensitive to environmental (i.e., water quality) conditions. This *Green Infrastructure Toolbox* identifies strategies for reducing the volume and improving the quality of rainwater entering the creeks. While it is unlikely that all of the rainwater can be accommodated with the BMPs described, every green element will help.

The tools presented in this section are multi-dimensional practices that meet traditional water quality and quantity standards outlined in many stormwater ordinances, as well as achieving planning, urban design, and landscaping objectives. The practices are designed to address both the quantity and quality of runoff from new and existing developed sites and should be understood by local authorities, planners, designers, engineers, and developers working in West Union. These measures can be designed and implemented in new developments as well as retrofitted into existing developments in cost effective ways. The practices discussed here include bio-retention, green roofs, pervious pavement, native landscape systems, and rainwater harvesting and reuse.

While these practices require some creative and open-minded thinking on the part of the City of West Union and the development community, they can be designed into almost any development area. These strategies and recommendations are designed to provide better information about costs, design, and maintenance requirements to those implementing the practices. The details and diagrams presented here are conceptual and do not account for particular site conditions or runoff volumes. It is essential that each practice is designed and engineered specifically for a particular site and runoff volume, which will depend on the area draining to a particular rainwater management feature.

One strategy that should be considered, heating streets and sidewalks with renewable energy sources, is not included in the toolbox. West Union could enhance year-round retail sales by using ground source thermal heating or other alternative renewable energy measures to melt winter snow and ice, providing an alternative to using salt, plows, and shovels. Less snow, slush, and ice translates into greater pedestrian access, safety, and higher retail sales in winter months. Clear, dry sidewalks means less slipping and sliding by shoppers. The reduction of freeze-thaw cycles reduces cracking and buckling, and the associated maintenance and repair costs, in streets and sidewalks.

The source of heat for such a strategy comes free of charge from latent heat stored in the ground and from solar thermal heated water, both of which are considered ‘renewable’ sources of energy. Alternately, a utility duct can be installed beneath sidewalks and the heat that is normally emitted by utility lines can provide the heat source. Waste heat from nearby utilities also may be explored.

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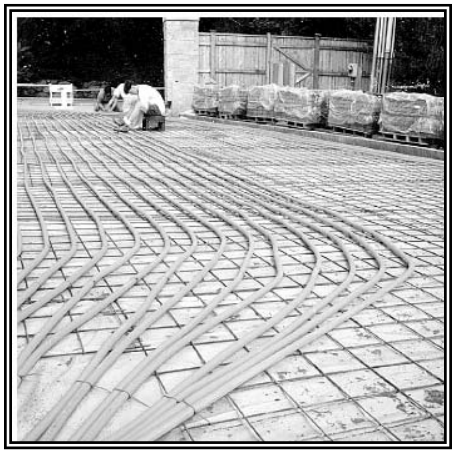
Holland and Grand Rapids, Michigan, are both using heating systems to melt snow and ice. In Holland, the snow and ice melting system uses free energy — waste heat recovered from a regional power generation plant. The heat transfers to the snow and ice melting circulating loop via water-to-water heat exchangers and piping under the pavement (167,000 square feet). The system works automatically, so it requires only minimal attention from city maintenance workers. Because falling snow melts on contact, expensive labor and equipment are not needed to remove snow or to spread snow.



Holland MI
Photographs by Cnservation DesignForum

BIORETENTION PRACTICES

DEFINITION

Parkway rain gardens, tree wells, and planter boxes can be designed as vegetated stormwater bioretention features that convey, retain, cool, and cleanse stormwater before being discharged to streams. They are installed in parkways, medians, and parking lot islands, and along the sides of buildings to capture roof runoff. These practices are typically designed to allow stormwater to pond slightly and be absorbed and evaporated into the atmosphere by vegetation. Excess water is collected by a drain and discharged to storm sewers.

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Portland, Oregon, ©Environmental Services Portland, OR Photograph by Conservation Design Forum

APPLICABILITY

Bioretention practices are appropriate for most new and retrofit projects on individual lots and rights-of-way to accept runoff from roof downspouts, streets, driveways, alleys, sidewalks, and parking lots.

BENEFITS

- Reduces impervious surface runoff volumes (up to 15%) and rates (50% or more).
- Reduces sediments and metals (30 to 70%), nutrients (10 to 30%), and other pollutants from runoff.
- Provides stormwater detention, depending on the thickness of the gravel layer.
- Provides limited habitat for birds, butterflies, and beneficial insects such as dragonflies, which eat mosquitoes.
- Can increase aesthetic value of properties.

COST CONSIDERATIONS

Costs range from $3 to $4 per square foot for very simple designs and from $10 to $40 per square foot for complex drainage designs, depending on the plants, drainage structures, and curb designs.

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Morton Arboretum, Lisle IL,
Photograph Conservation Design Forum

Baizanni Corportation, Grand Rapids, MI
Photograph Conservation Design Forum

Environmental Services, Portland OR

DESIGN CONSIDERATIONS

- Bioretention practices must be sized and designed to account for drainage area and soils and to convey the design runoff rate (typically the 10-year storm).
- A gravel trench with underdrain should be used to allow excess flow to drain into storm sewer system.

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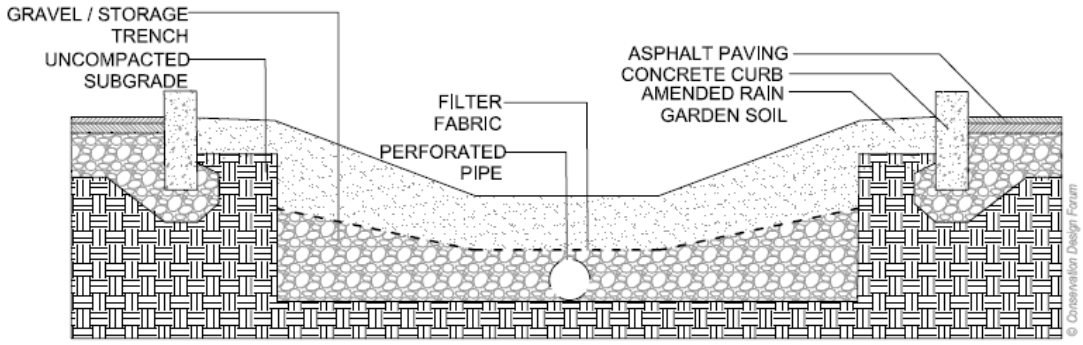
- Protect bioretention practices from construction site runoff to prevent sealing of amended topsoil.
- Provide adequate side slopes and underdrains to prevent ponding of water for greater than 48-72 hours.
- A minimum 12 inch topsoil layer of approximately 5% clay, 15% organic material, and 80% sand will enhance filtration. Topsoil should be amended with compost to improve organic content for filtering and to improve retention of runoff. Topsoil soil thickness should be increased to 18 to 24 inches to accommodate trees.
- Filtration benefits can be improved by planting native deep-rooted grasses and forbs and minimizing side slopes. Plants can include a combination of native shrubs, grasses, and flowering perennials. Plants should be selected for low maintenance and to tolerate winter salt and sand applications. In order to protect vegetation, try to store snow outside of the bioretention features.



MAINTENANCE CONSIDERATIONS

- Similar to typical gardens requiring occasional weeding and additional plantings.
- Periodic sediment removal may be needed to maintain function.
- Bioretention practices may need to be replaced periodically (every 20 years or more) due to sediment accumulation
- Periodic inspection will ensure proper operation and identify vegetative management needs.

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GREEN ROOFS

Chicago City Hall, Chicago, IL, Conservation Design Forum

DEFINITION

Vegetated roof system designed to retain, slow, cool, and cleanse rainwater runoff on the top of buildings. Green roofs are generally planted with drought tolerant vegetation. The soil and vegetation evaporate and transpire precipitation to the atmosphere.

APPLICABILITY

Green roofs are appropriate for new and retrofit buildings at many scales from small garages to large warehouses and residential complexes. The load bearing capacity of the roof may dictate the type of green roof used.

BENEFITS

- Significantly reduces runoff volumes and rates (50 - 90% reduction in annual runoff) as well as thermal loading of runoff.
- Extend the life of roofs two to three times (20 years or more) by protecting the roofing system from inclement weather and solar radiation.
- Can help meet detention requirements.
- Reduces the urban heat island effect.

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- Can reduce heating and cooling energy requirements.
- Creates opportunities for outdoor space as roof top gardens.
- Creates habitat and preserves biodiversity in an otherwise sterile urban landscape.

CDF Chicago Headquarters, Conservation Design Forum

MAINTENANCE CONSIDERATIONS

- Achieving root establishment in the first few years requires regular attention, weeding, and some irrigation. Once established the maintenance requirements are similar to typical gardens.
- Drainage flow paths require regular inspection. Otherwise, normal garden maintenance requirements should be followed.
- Extensive systems require maintenance approximately 1 to 3 times per year while intensive systems require more regular maintenance.

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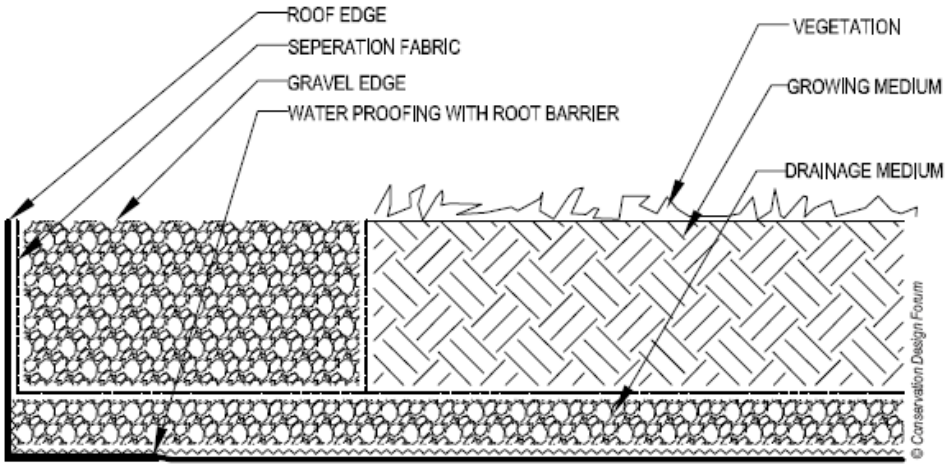

DESIGN CONSIDERATIONS

- Structural load capacity of existing roof system must be evaluated to determine ability to support a green roof.
- Intensive green roof systems can support a wide range of vegetation including trees and shrubs. These systems typically use a minimum of 6 to 12 inches of soil and weigh 40 to 80 pounds per square foot. Intensive roofs provide greater stormwater benefits, greater filtration, greater stormwater storage, more insulation, and greater opportunities for habitat than extensive systems.
- Lightweight, extensive green roof systems typically use short stature plants with shallow root systems, such as drought tolerant succulents. A minimum of 4 inches of soil is required, and typically weigh at least 22 pounds per square foot.

Chicago City Hall, Chicago, IL, Conservation Design Forum

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Kansas City Library, Kansas City MO
photograph-Conservation Design Forum

Peggy Notebaert Nature Center, Chicago, IL
Conservation Design Forum

COST CONSIDERATIONS

Typical costs for green roofs range from approximately $18 to $25 per square foot, depending on the type and intensity and plant selection. Another estimate suggests that new green roofs cost $5 to $12 per square foot ($2 to $10 for conventional roofs) and retrofit green roofs cost $7 to $12 ($4 to $15 for conventional roofs). Installment and maintenance costs can be recovered by reduced roof replacement needs and building energy cost savings.

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PERMEABLE PAVEMENT

DEFINITION

Permeable or perforated paving materials or pavers with spaces between pavers allow transmission of water to an aggregate base, reducing runoff volume and improving water quality. Runoff is temporarily stored in the base and slowly evaporated and released to storm sewers. Paving blocks and grids, the most common and available type of permeable pavement, are modular systems containing openings filled with gravel or rock chips. Porous pavement, concrete, and asphalt contain larger than typical aggregates and pore space to allow water percolation, but are less common with greater design concerns. Variations on gravel are a third type of permeable practice.

Kresge Foundation Headquarters, Troy MI Conservation Design Forum

APPLICABILITY

Permeable pavement is appropriate for new and retrofit projects on existing streets, full and temporary (overflow and special event) parking lots, alleys, sidewalks, utility and access roads, emergency access lanes, fire lanes, and driveways. Not appropriate for vehicle service stations, gas stations, and other areas used for transfer or storage of hazardous materials.

BENEFITS

- Reduces stormwater runoff volumes by 20% or more depending on depth of the aggregate base.
- Reduces stormwater runoff rates, by up to 95%.

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- Filters sediments, hydrocarbons, nutrients, and other urban pollutants from runoff and reduces runoff temperatures.
- Can help meet detention requirements and reduce stormwater conveyance and detention infrastructure needs (detention storage can be provided within the gravel base below the surface.)
- Reduces need for deicing salt and salt impacts to water quality.
- Less ponding of water on the driving or parking surface reduces skidding, hydroplaning, and ice buildup.

MAINTENANCE CONSIDERATIONS

- Nylon tipped snow plow blades are recommended due to the slightly uneven surface of the pavement.
- Standard vacuum street sweeping equipment and high pressure washing may be used to maintain pavement infiltration capacity.
- Porous asphalt and concrete paving may have higher maintenance requirements than permeable paving blocks.

DESIGN CONSIDERATIONS

- Most effective over an open graded gravel base with no fines. Installation over a concrete base negates most of the benefits of this practice.
- Larger pore space improves effectiveness, though larger openings may reduce the strength of the paver for load bearing and driving.
- Base and subbase materials should be at least 12" of coarse aggregate with no fines to allow adequate drainage, prevent frost heave, and provide adequate load bearing strength.
- Subgrade should be graded at minimum 1% slope to allow drainage.
- Underdrains should be placed at edge of pavement to provide drainage as necessary to prevent ponding in the base for periods greater than 24 to 48 hours.
- Permeable paving may not be appropriate for land uses utilizing or storing hazardous materials.

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Morton Arboretum, Lisle IL, photograph Conservation Design Forum

COST CONSIDERATIONS

Installation costs can be two to three times greater than conventional concrete or asphalt, but may require less frequent replacement. The runoff reduction capacity of permeable paving can reduce the cost of stormwater engineering and infrastructure (curbs, gutters, and storm sewers.)

System	Cost/SquareFoot Installed
Conventional Asphalt	$1.00 to $2.50
Porous Concrete	$2.00 to $6.50
Gravel / Gravel-Grass (without reinforcement)	$1.50 / $2.50 to $6.00
Permeable Paver Systems	$4.50 to $6.00

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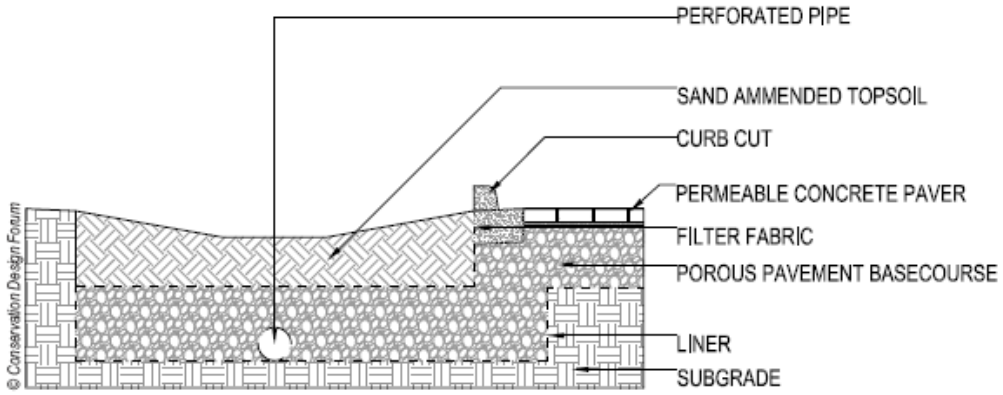
PERMEABLE PAVEMENT
PERMEABLE PAVERS

DESCRIPTION

Permeable paver systems contain spaces, gaps, and crevices through which water may pass. Pavers manufactured with openings or gaps can be purchased, but virtually any brick paver can be used to create a permeable paving system by using plastic or other inserts to create the gaps between individual paving blocks. Interlocking permeable pavers have greater structural capacity than those created with spacers. Gaps can be filled with a sandy growing medium, which can be used to grow vegetation, or medium-sized gravel (3/8 inch), which will pass greater rates of water than the growing medium.



BENEFITS

- Gravel-filled crevices can pass high rates of rainfall through the paver surface – up to 10 inches per hour and higher when new, and 2 inches per hour for mature systems.
- Individual broken pavers can be replaced. Pavers can also be removed to repair or install utilities below the pavement.
- Extremely durable and long lasting, the structural capacity of interlocking pavers rivals that of asphalt while being more flexible and less subject to cracking.
- Surface clogging can be addressed by removing and replacing the top two centimeters of crevice fill material. Removal of pavers should never be necessary to restore surface permeability.
- Various aesthetically pleasing patterns and colors are available.
- Grass (if desired) is kept to a manageable height by tire friction.

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- Can be cost competitive when longevity and stormwater system costs are included in overall project cost.
- Machine installation significantly reduces installation cost.

DRAWBACKS

- Generally not appropriate for high speed streets and highways (recommended for speeds up to 30 mph and/or 2000 adt.)
- Installation cost is higher than conventional paving surfaces.
- The use of a nylon tip plow or plow shoes to hold blade above surface is suggested to minimize scuffing of the pavers during snow removal.
- Stormwater management design more complex than conventional sewer and detention system.

MAINTENANCE CONSIDERATIONS

- Twice annual vacuum sweeping recommended to reduce or eliminate remedial maintenance needs.
- Remedial maintenance (removal and replacement of crevice fill material) may be necessary where sediments have washed onto the pavement and sealed the surface.

Villa Park Police Station, Villa Park, IL
Conservation Design Forum

Elmhurst College, Elmhurst, IL
Photograph by Conservation Design Forum

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PERMEABLE PAVEMENT
POROUS ASPHALT AND CONCRETE

DESCRIPTION

Similar to conventional asphalt and concrete but with the aggregate fines removed to allow water to pass through the surface. Permeable asphalt and concrete are appropriate for virtually any application where conventional asphalt and concrete are used except where hazardous materials are expected (e.g., gas stations.) Porous asphalt has been used for over fifty years to improve drainage and safety on airfields.

Porous Concrete

Porous Asphalt

BENEFITS

- Can be used virtually anywhere that conventional asphalt or concrete are used, including highways, where permeable paver systems are not appropriate.
- Very high infiltration capacity (20 to 200 inches per hour) when protected from clogging.
- Less road noise relative to conventional asphalt and concrete.
- Appearance similar to conventional asphalt or concrete.
- Surface clogging can be restored through use of pressure wash and vacuum equipment.
- Lower installation cost than permeable paver systems when there is local installation experience.

DRAWBACKS

- Requires specialized polymer additives to reduce clogging.
- No known local installations or batching plants.
- Greater asphalt layer thickness is required to achieve same strength as conventional asphalt.

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- Installation and replacement cost is higher than conventional asphalt and concrete paving due to greater asphalt thickness and required additives.
- Lower durability and longevity than permeable paver systems.
- Lack of education may result in surface being seal coated or resurfaced with non-porous material.
- Stormwater management design more complex than conventional sewer and detention system.

Porous Concrete, Sylvan Slough Natural Area, Rock Island, IL Photograph Conservation Design Forum

Porous Asphalt, Ryerson Nature Center, Riverwoods, IL
Photograph Conservation Design Forum

MAINTENANCE CONSIDERATIONS

- Twice annual vacuum sweeping recommended to reduce or eliminate remedial maintenance needs.
- Remedial maintenance power washing and vacuuming may be necessary where sediments have washed onto the pavement.

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PERMEABLE PAVEMENT
GRAVEL AND GRAVEL-GRASS

DESCRIPTION

Gravel and gravel-grass (a combination of growing medium (soil) and open graded gravel) have sufficient permeability to pass water through the surface and into the base layer or to a drainage layer below. These practices are most appropriate for parking lots, emergency access lanes, alleys, driveways and other low use, intermittent use, and/or seasonal applications. Gravel alone may be more subject to clogging over time than gravel-grass due to dust created by normal use. The vegetation of gravel-grass helps maintain the porosity of the surface for water flow. Strength of the paving surface can be increased and potential for wear and tear (wheel tracks) decreased using geocell reinforcement such as "Geoblock", "Grasspave", and other proprietary products, but these are not required.

Kane County Cougars Stadium, Batavia, IL Conservation Design Forum

DRAWBACKS

- May be more subject to modest wear and tear (wheel tracks) over time relative to conventional paving with similar base thickness.
- May be subject to clogging over time with high use.
- Geocell reinforcement, if used, can be damaged by harsh conditions (tire spinning) and when inadequately filled to prevent direct contact between the tire surface and the geocell.
- As with conventional gravel surface, snow plowing is more difficult than on smooth pavements.
- Aesthetics – with routine use, vegetation may not become lush, particularly during dry conditions.

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- Stormwater management design more complex than conventional sewer and detention system.

Kane County Cougars Stadium, Batavia, IL Conservation Design Forum

MAINTENANCE CONSIDERATIONS

- Periodic replacement or filling of wheel tracks may be required.
- If lush cover is desired, irrigation may be necessary.
- Mowing of vegetation may be required with very low use areas.

BENEFITS

- Can pass relatively high rates of rainfall through the pavement surface.
- Low installation, maintenance, and replacement cost compared to conventional paving.
- Damaged areas are easy to repair.
- Surface clogging is restorable through removal and replacement of top inch of gravel-grass surface.
- Dust and the urban heat island effect are controlled by vegetation growth.
- Aesthetics – when only used for emergency access or other low frequency use, vegetation masks the surface as a pavement area.
- Grass is kept to a manageable height by tire friction and can be mown if needed.

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NATIVE LANDSCAPE SYSTEMS

DEFINITION

Establishment of native vegetation in landscaped areas and often as a component of other stormwater best management practices such as filter strips, bioretention features, and green roofs. Deep root systems (3 to 10 feet or more) help filter and absorb rainwater. A filter strip is an area with dense, preferably native vegetative cover (they can also be planted with turf grass) that is used to slow, filter, and absorb runoff from impervious areas. Use native plant and tree species that are adapted to urban applications.

Peggy Notabaert Nature Center, Chicago, IL Conservation Design Forum

APPLICABILITY

Native landscapes are appropriate for nearly all new and retrofit landscapes on individual lots and community-wide. Native landscapes can be used for nearly any landscape installation, rainwater management practices, parks, green roofs, residential courtyards, and gardens.

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BENEFITS

- Reduces runoff volumes (by up to 65% when used with bioretention and/or filter strips).
- Increases ability of landscape to remove nutrients (up to 70%), heavy metals (up to 80%), sediment, and other pollutants, especially when used with other stormwater practices.
- Stabilizes and increases organic content of soils.
- Reduces irrigation and fertilization requirements.
- Reduces use of fossil fuels and air and noise pollution relative to turf landscapes that require regular mowing and maintenance.
- Provides wildlife habitat for birds, butterflies, and insects.
- Moderates temperature extremes and urban heat island effect.
- Provides aesthetic benefits throughout the year.

South State Commons, Ann Arbor, MI InSite Design Studio

MAINTENANCE CONSIDERATIONS

Natural landscaping requiers less irrigation, mowing, fertilizers, and pesticides than conventional landscapes. Annual mowing or controlled burning are appropriate for natural landscapes, though burning may not be appropriate in the East Riverfront District. Initial watering and herbiciding may be necessary in the first 2-3 years after planting, but once established (3-4 years) these needs are greatly diminished.

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DESIGN CONSIDERATIONS

- Design should be tailored to site characteristics including topography, soils, drainage, and solar exposure.
- Some local "weed" ordinances may need to be amended to allow native and taller vegetation.
- Plant diversity and health is maximized by annual burning. Plots may be mowed and then burned to prevent spread of fire on small sites.
- On compacted or disturbed soils, amendment may be necessary to increase organic content, improving success of plant establishment. Good soil preparation vastly improves the appearance and vigor of plantings in the first season.
- Filter strips/level spreaders must be sized and designed to account for drainage area, slope and soils. The highest effectiveness is achieved for small (1 or 2 year) storm events when the drainage area is not greater than 4 or 5 times the area of the filter strip.

Tellabs Corporate Headquarters, Naperville, IL
Conservation Design Forum

COST CONSIDERATIONS

Costs vary from project to project depending on area, plant selection, and design features. In general, native landscapes cost approximately $3000 to $6000 per acre to install, compared to $7500 to $15,000 for conventional turf. These costs consider first maintenance and reflect planting seed as opposed to native plant plugs. Maintenance costs, on average, are between $1600 and $1800 per acre for native landscapes, compared to $5500 to $6500 for turf grass. Maintenance costs for native landscapes are slightly less than turf for the first five years, and significantly less thereafter, when annual burning or other control method is the only maintenance needed. Installation

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costs are similar to conventional turf, approximately $2000 to $4000 per acre. However, if sod and/or underground irrigation systems are installed, conventional turf landscaping is more expensive.

RAINWATER HARVESTING AND REUSE

DEFINITION

Downspouts from roof runoff can be directed into a vessel specially designed to capture and temporarily store rainwater for various uses, including greywater reuse and landscape irrigation.

Kresge Foundation Headquarters, Troy, IL
Conservation Design Forum

Center for Green Technology, Chicago, IL
Photograph Conservation Design Forum

APPLICABILITY

Rain barrels and cisterns can be used at a variety of scales on new and retrofit buildings, but may not be an appropriate strategy for large amounts of runoff. The area and configuration of the roof will determine the size and location of the vessels.

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BENEFITS

- Reduces runoff volumes from small to moderate rain events and prevents flow into the combined sewer system.
- Conserves water for reuse (e.g. irrigation of lawns and gardens).

DESIGN CONSIDERATIONS

- Collected water can be applied to landscapes or, if adequate landscaping area is not available, released into the sewer system between storm events.
- A mesh filter or screen can be inserted at the top of the barrel to prevent leaves and other debris from entering.
- One inch of rainfall over 1,000 square feet of roof area is equivalent to 625 gallons of rainwater.
- Rain barrels can be used in combination with bioretention, green roofs, and other practices to increase stormwater benefits.
- Larger cisterns in some settings may be used to provide greywater for use in toilet flushing and other non-potable uses.

Residential Rain Barrels, M. de la fleur, Conservation Design Forum

COST CONSIDERATIONS

Rain barrels made specifically for this purpose can cost between $20 and $150. Cost of cisterns can vary widely depending on size, location, and intended use.

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MAINTENANCE CONSIDERATIONS

- Rain barrels and cisterns must be drained (such as for irrigation) regularly between storm events to maintain their effectiveness at retaining stormwater. Occasional draining and cleaning may also be necessary to remove debris, such as leaves, that may fall into the vessel. Draining and cleaning will also prevent stagnation and buildup of algae.
- The rain barrel should be sealed during warm weather to avoid mosquito breeding.
- To prevent freezing and damage to the barrel or cistern, they should be drained before winter.

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Iowa Green Communities Criteria 2008

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Iowa Green Communities Criteria: An Overview

The Iowa Green Communities Criteria promote public health, energy efficiency, water conservation, smart locations, operational savings and sustainable building practices. The Iowa Green Communities Criteria apply to all Iowa Department of Economic Development future affordable housing, community facility, and Main Street Iowa Challenge Grant projects described below. As a result, the strategies in the following pages enhance affordable housing, community facilities, town centers and communities as a whole.

In addition to increasing resource efficiency and reducing environmental impacts, green building strategies can yield cost savings through long-term reduction in operating expenses. The benefits include improved energy performance and comfort, a healthier indoor environment, increased durability of building components, and simplified maintenance requirements that can lead to financial efficiencies for property managers and owners. Green building practices improve the economics of managing affordable housing, community facilities, and Main Street businesses while enhancing quality of life for residents, visitors and employees. When green building practices inform the location of our buildings – placing homes, community facilities and businesses near community amenities such as public transportation to create walkable, livable neighborhoods – the benefits for citizens and communities expand to include fewer sprawl-related transportation impacts.

Guiding principles behind the Iowa Green Communities Criteria ensure that buildings must be cost effective to build, and durable and practical to maintain. In addition, the principles work together to help produce green buildings that:

- Result in a high-quality, healthy living and working environment
- Lower utility costs
- Enhance connections to nature
- Protect the environment by conserving energy, water, materials and other resources
- Advance the health of local and regional ecosystems

How to Use This Document

The Iowa Green Communities Criteria is based substantially on the model national Green Communities Criteria available online at http://www.greencommunitiesonline.org/tools/criteria/index.asp. The 2008 version of the national Green Communities Criteria is purposefully aligned with the United States Green Building Council's Leadership in Energy and Environmental Design's Rating System for Homes. The Iowa Department of Economic Development thanks Enterprise and its Green Communities partners for development of the national Green Communities Criteria and the use of those criteria in development of the Iowa Green Communities Criteria.

All of the mandatory Iowa Green Communities Criteria as modified in this document are required. Please be aware that this Iowa Green Communities Criteria document is subject to periodic revision and update. Refer to the Iowa Department of Economic Development's Community Development Division Web site, www.iowalifechanging.com/community/ for the most current version.

(Note: The mandatory criteria referenced in this document are based on the national Green Communities Criteria as of February 2008. Any revisions to the national Green Communities Criteria will not apply to Iowa Department of Economic Development projects unless adopted by the Iowa Department of Economic Development and specifically addressed in the Iowa Green Communities Criteria.)

Activities and Projects Covered by the Iowa Green Communities Criteria

The Iowa Green Communities Criteria include mandatory and optional components in the criteria for the following types of activities or projects.

- Multi-family new construction
- Multi-family "gut" rehabilitation[1] (see definition below)
- Multi-family rehabilitation[2]
- Single-family new construction
- Community facility buildings awarded Community Development Block Grant funds
- Main Street Iowa Challenge Grant projects

[1] *Gut Rehabilitation* – Gut rehabilitation is defined as an activity or project that involves extensive (substantial) rehabilitation in terms of total removal and replacement of all interior (non-structural) systems, equipment, components or features of the existing structure to be rehabilitated or converted, whereby the existing structure will be reduced (as part of the rehabilitation or conversion of the structure) down to the basic structure or exterior building shell (e.g., the foundation system; exterior walls; roofs; and interior structural components such as columns, beams, floors and structural bearing walls). Gut rehabilitation may also include structural and non-structural modifications to the exterior of the structure.

[2] *Multi-family rehabilitation* – For multi-family activities and projects involving rehabilitation, the project shall implement all of the mandatory Iowa Green Communities Criteria that are applicable to that specific project. For example, projects replacing interior light fixtures shall adhere to criterion 5-3a, Efficient Lighting Interior, and projects replacing bathroom exhaust fans shall adhere to criterion 7-5a, Exhaust Fans – Bathroom. Project applicants shall document for IDED any mandatory criteria that will not be met and explain the reason for not meeting that criteria. Criterion 5-1b, Efficient Energy Use: Rehabilitation, shall be applicable to all projects.

Additional Requirements

In addition to the Iowa Green Communities Criteria the following requirements, as applicable, apply to all activities and projects covered by the Iowa Green Communities Criteria.

- ❖ All new construction (including single-family and multi-family housing activities and projects), less than four stories in height, is subject to the requirements of Energy Star.
- ❖ All newly constructed housing (single-family and multi-family) and all multi-family rehabilitation projects or activities shall be professionally designed, complete with a detailed set of construction plans and specifications that incorporate all applicable requirements of the Iowa Green Communities Criteria and Energy Star.
- ❖ All newly constructed housing (both single-family and multi-family housing) funded with IDED's Housing fund are subject to the requirements of the International Energy Conservation Code (the most current version as adopted by the State Building Code).
- ❖ All newly constructed and rehabilitation housing activities or projects must meet the requirements of any and all locally adopted and enforced building codes, standards and ordinances. In the absence of locally adopted and enforced building codes, the building code requirements of the State Building Code shall apply.

Optional Points

While many of the Iowa Green Communities Criteria are mandatory, a significant number of additional optional criteria are also included in the green criteria for increasing the "greenness" or overall

sustainability and performance of homes and buildings. Projects incorporating the Iowa Green Communities optional criteria will be eligible to receive additional points during the application review and selection processes of the Iowa Department of Economic Development Housing Fund, Community Development Block Grant (CDBG), and Main Street Challenge Grant programs.

While each project has its own unique circumstances and characteristics, the optional criteria can be loosely grouped into the following levels of difficulty to achieve based on costs and available technologies, codes/ordinances and skill sets.

Easier to Achieve	**Points**
Smart Site Location – Proximity to Services	15
Walkable Neighborhoods	5
Storm Drain Labels	2
Photovoltaic (PV) Ready	2
Reduced Heat-Island Effect – Roofing	5
Reduced Heat-Island Effect – Plantings	5
Total Points	**34**
Easy to Moderate to Achieve	
Smart Site Location – Passive Solar Heating/Cooling	4
Additional Reductions in Energy Use	Varies
Recycled Content Material	Varies
Exhaust Fans – Kitchens Rehabilitation	5
Ventilation – Rehabilitation	10
Healthy Flooring Materials – Alternative Sources	5
Smoke-Free Building	2
Total Points	**26+**
More Difficult to Achieve	
Smart Site Location – Grayfield, Brownfield or Adaptive Reuse Site	10
Compact Development	5
Transportation Choices	12
Electricity and Gas Meters (individual)	2
Renewable Energy	Varies
Reduce Heat-Island Effect – Paving	5
Total Points	**34+**

Applications achieving the following ranges of optional criteria points will receive 1 to 3 additional points during the review and selection of Housing Fund and Community Develop Block Grant community facility projects.

Optional Green Criteria Point Range	**Application Bonus Points Received**
2-30 points	1
31-60 points	2
76-136 points	3

Other Resources

Here are some additional resources to assist you with your green project:

- Building Green, LLC/Environmental Building News - http://www.buildinggreen.com/
- Center on Sustainable Communities - http://www.icosc.com/
- Certified 3rd-Party Energy Raters - http://www.natresnet.org/directory/raters.aspx
- Energy Star - www.energystar.gov
- Green Communities - www.greencommunitiesonline.org/resources.asp
- Green Home Guide - http://www.greenhomeguide.org/
- National Association of Homebuilders Model Green Home Building Guidelines - http://www.nahb.org/fileUpload_details.aspx?contentTypeID=7&contentID=1994
- Partnership for Advanced Technologies in Housing - http://www.pathnet.org/
- U.S. Green Building Council - http://www.usgbc.org/

For even more resources, visit the Iowa Department of Economic Development's Community Development Division Web site www.iowalifechanging.com/community/.

Section 1: Integrated Design

An integrated design process incorporates sustainability up-front, uses a holistic and total-systems approach to the development process, and promotes good health and livability through the building's life cycle. The goal is to establish a written commitment that informs the project's objectives through the building's life cycle.

Sustainable building strategies should be considered from the moment the developer initiates the project. The professional development team should include a developer, architect, engineer, landscape architect, LEED™ Accredited Professional or experienced green building design specialist, contractor, and asset and property management staff. Whenever possible, the team also should include maintenance staff and resident representatives. The team must be committed to environmentally responsive, resource conserving and healthy building principles and practices.

Section 2: Site, Location and Neighborhood Fabric

Location within existing communities – or contiguous to existing development – helps conserve land and the spread of storm-water runoff to new watersheds. It also reduces travel distances. Proper site selection avoids development of inappropriate sites and damage to or loss of fragile, scarce environmental resources. The greatest savings come from developing in areas that already have infrastructure and civic amenities. Site selection is also an opportunity to clean up and redevelop brownfields, and restore the land and infill segmented communities.

Compact development encourages more resource-efficient development of land, reduces development costs and conserves energy. It also can contribute to creating more walkable, livable communities, while helping restore, invigorate and sustain livable development patterns. Making the streetscape safer and more inviting for walkers and bicyclists encourages alternative transportation choices to the automobile. It also promotes physical activity and public health, while creating opportunities for social interaction and increased safety by bringing more eyes on public spaces.

Section 3: Site Improvements

Sustainable design and site planning integrate design and construction strategies to: minimize environmental site impacts; enhance human health; reduce construction costs; maximize energy, water, and natural resource conservation; improve operational efficiencies, and promote alternative transportation.

Section 4: Water Conservation

Water efficiency conserves finite fresh water resources and reduces utility bills. Significant water savings can be realized by specifying and installing water-efficient appliances and plumbing fixtures, implementing low-water landscape and irrigation strategies, and taking advantage of rainwater catchment and graywater sources.

Section 5: Energy Efficiency

Energy efficiency helps to maximize resident comfort and health, and reduces utility bills. Conservation measures mitigate the accumulative burdens of energy production and delivery, extraction of nonrenewable natural resources, degradation of air quality, global warming and the increasing concentration of pollutants.

Section 6: Materials Beneficial to the Environment

Reducing, reusing and recycling building materials conserve natural resources and reduce emissions associated with manufacturing and transporting raw materials. Many techniques and building products on the market contribute to more durable, healthy and resource-efficient buildings.

Section 7: Healthy Living Environment

The importance of a healthy living environment is a significant green building issue directly affecting residents. Creating a healthy living environment involves the use of materials that do not cause negative health impacts for residents or workers, especially for more sensitive groups such as children, seniors and individuals with existing respiratory problems and compromised immune systems.

Section 8: Operations and Maintenance

Operations and maintenance (O&M) practices impact the building owner's costs and residents' health, comfort and safety. Sustainable building O&M practices enhance resident health and operational savings. The key to successful building performance is the integration of O&M plans, education and cost-effective, low-maintenance design.

Iowa Green Communities Checklist

Section 1: Integrated Design Process

Y	N	Item #	Item Title	Points
		1.1	Green Development Plan	Mandatory
		1.2	Universal Design	5

Section 2: Location and Neighborhood Fabric

Y	N	Item #	Item Title	Points
		2.1a	Smart Site Location — Proximity to Existing Development	Mandatory
		2.1b	Smart Site Location — Protecting Environmental Resources	Mandatory
		2.1c	Smart Site Location — Proximity to Services	15
		2.2	Compact Development: New Construction	Mandatory
		2.2b	Compact Development	5
		2.3	Walkable Neighborhoods	Mandatory
		2.4a	Smart Site Location — Passive Solar Heating/Cooling	5
		2.4b	Smart Site Location —Grayfield, Brownfield or Adaptive Reuse Site	15
		2.5	Walkable Neighborhoods	5
		2.6	Transportation Choices	12

Section 3: Site Improvements

Y	N	Item #	Item Title	Mandatory/ Optional
		3.1	Environmental Remediation	Mandatory
		3.2	Erosion and Sedimentation Control	Mandatory
		3.3	Landscaping	Mandatory
		3.4	Surface Water Management	Mandatory
		3.5	Storm Drain Labels	2

Section 4: Water Conservation

Y	N	Item #	Item Title	Mandatory/ Optional
		4.1	Water-Conserving Appliances and Fixtures	Mandatory
		4.2	No Irrigation	Mandatory

Section 5: Energy Efficiency

Y	N	Item #	Item Title	Mandatory/ Optional
		5.1a	Efficient Energy Use: New & Gut Rehabilitation	Mandatory
		5.1b	Efficient Energy Use: Rehabilitation	Mandatory
		5.2	Energy Star and Energy Efficient Appliances	Mandatory
		5.3a	Efficient Lighting – Interior	Mandatory
		5.3b	Efficient Lighting – Exterior	Mandatory
		5.4	Electricity and Gas Meters	2
		5.5	Additional Reductions in Energy Use	Optional
		5.6a	Renewable Energy	15
		5.6b	Photovoltaic (PV) Ready	2
		5.7	HVAC Sizing and Installation	Mandatory

Section 6: Materials Beneficial to the Environment

Y	N	Item #	Item Title	Mandatory/ Optional
		6.1	Construction Waste Management	Mandatory
		6.2	Recycled Content Material	14
		6.3	Certified, Salvaged and Engineered Wood	5
		6.4a	Water-Permeable Walkways	5
		6.4b	Water-Permeable Parking Areas	5
		6.5a	Reduce Heat-Island Effect – Roofing	5
		6.5b	Reduce Heat-Island Effect – Paving	5
		6.5c	Reduce Heat-Island Effect – Plantings	5
		6.6	Durable & Low Maintenance Exteriors	Mandatory

Section 7: Healthy Living Environment

Y	N	Item #	Item Title	Mandatory/ Optional
		7.1	Low/No VOC Paints & Primers	Mandatory
		7.2	Low/No VOC Adhesives & Sealants	Mandatory
		7.3	Urea Formaldehyde-Free Composite Wood	Mandatory
		7.4	Green Label Certified Floor Coverings	Mandatory
		7.5a	Exhaust Fans – Bathrooms	Mandatory
		7.5b	Exhaust Fans – Kitchens	Mandatory
		7.5c	Exhaust Fans – Kitchens Rehabilitation	5
		7.6a	Ventilation	Mandatory
		7.6b	Ventilation – Rehabilitation	10
		7.7	Water Heaters – Mold Prevention	Mandatory
		7.8	Cold and Hot Water Pipe Insulation	Mandatory
		7.9a	Materials in Wet Areas – Surfaces	Mandatory
		7.9b	Materials in Wet Areas – Tub & Shower Enclosures	Mandatory
		7.10a	Basements & Concrete Slabs – Vapor Barrier	Mandatory
		7.10b	Basements & Concrete Slabs – Radon: New Construction	Mandatory
		7.11	Water Drainage	Mandatory
		7.12	Garage Isolation	Mandatory
		7.13	Clothes Dryer Exhaust	Mandatory
		7.14	Integrated Pest Management	Mandatory
		7.15	Healthy Flooring Materials – Alternative Sources	5
		7.16	Smoke-Free Building	2
		7.17	Combustion Equipment (includes space & water-heating)	Mandatory

Section 8: Operations and Maintenance

Y	N	Item #	Item Title	Mandatory/ Optional
		8.1	Building Maintenance Manual	Mandatory
		8.2	Occupant's Manual	Mandatory
		8.3	Homeowner and New Resident Orientation	Mandatory

Focus on Livable Communities

The Economic Benefits of Walkable Communities

People Pay A Premium to Live Where It's Walkable.

A 1999 study by the Urban Land Institute of four new pedestrian-friendly communities determined that homebuyers were willing to pay a $20,000 premium for homes in them compared to similar houses in surrounding areas.[1]

Each of the four communities, including Kentlands (right), in Gaithersburg, Maryland, promoted transit and pedestrian access. Design features included systems of interconnected, often narrow streets, sidewalks, a mix of residential, retail and office land uses, and features such as street trees, short front yard set-backs, front porches, and rear garages accessed by alleys.

"First fix the streets, then the people and business will follow."

—Dan Burden, Walkable Communities, Inc.

City and county leaders in California are most motivated to push for pedestrian-oriented infrastructure and land uses when there is a clear economic benefit to their communities.[2] There are solid connections between walkable environments and economic viability. This brochure highlights some aspects of that nexus.

Walkability Is A Good Investment.

According to a 1998 analysis by ERE Yarmouth and Real Estate Research Corporation,[3] real estate values over the next 25 years will rise fastest in "smart communities" that incorporate traditional characteristics of successful cities including a mix of residential and commercial districts and a "pedestrian-friendly configuration."

Walkability Increases Property Values.

Reducing traffic noise, traffic speeds, and vehicle-generated air pollution can increase property values. One study found that a 5 to 10 mph reduction in traffic speeds increased adjacent residential property values by roughly 20%. Another study found that traffic restraints that reduced volumes on residential streets by several hundred cars per day increased home values by an average of 18%.[4]

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web www.lgc.org

San Diego

Walkable Communities Will Attract "New Economy" Workers.

In a 1998 report, Collaborative Economics, a Silicon Valley think tank, profiled the connections between the physical design of communities and dynamic elements of the new knowledge-driven, service-oriented economy.[5]

The contemporary economy – with its smaller, decentralized firms – thrives on land use patterns that harken back to the towns of early industrial years, with city centers, corner stores and streetcar suburbs.

Walkable downtowns with a mix of restaurants, offices and housing promote interaction. Interaction is key since the new economy thrives on accessibility, networking and creativity.

Businesses Are Beginning to Leave Gridlocked, Auto-Dependent Cities.

The automobile has offered mobility and convenience for decades, but booming business centers like Atlanta and the Silicon Valley are showing how an overdependence on the car can gridlock economic development. As a result, major firms around the country are advocating for pedestrian- and transit-friendly development patterns, according to a 1999 report by the National Association of Local Government Environmental Professionals. Businesses are increasingly concerned with gridlock, lack of transportation choices, air pollution and the overall decline in quality of life that can make recruiting and retaining skilled workers difficult.[6]

- Hewlett Packard halted its planned expansion in Atlanta's Perimeter Center area, according to the report, because it did not want to subject 1,000 new employees to the area's serious traffic problems.

- Regional and national business leaders say that low-density, discontinuous and automobile-dependent land use patterns can cause higher direct business costs and taxes. The federal Office of Technology Assessment estimates that a single house built on the urban fringe requires $10,000 more in public services than one built in the urban core.[7]

- The California State Department of Transportation, cited in another source, estimated in 1990 that more than 197,000 hours per day were

being lost due to traffic congestion, costing California businesses more than $2 million a day. San Francisco's Bay Area Economic Forum estimates that area businesses lose $2 billion per year while their employees sit in traffic.[8]

- The American Highway Users Alliance estimates that commuters waste $1.1 billion a year idling in the Los Angeles region's four most congested interchanges. Their cost estimates account for lost time, spent fuel, cost to employers, traffic accidents, and environmental damage.[9]

- The Southern California region is expected to spend more than a trillion public and private dollars on roads and freeways, including more than $81 billion in public capital investment between 2000 and 2020. Yet, a report by the Southern California Association of Governments projects that those expenditures will result in a 330% *increase* in rush hour congestion because much of the new growth is expected to occur in outlying areas.[10]

Walkability Is A Tourist Magnet.

Tourists coming to Vermont to walk and bicycle in the scenic, human-scale towns and compact, pedestrian-friendly town centers have proved to be an economic boon. In 1992, an estimated 32,500 visiting cyclists spent $13.1 million in Vermont – about twice the amount of money generated by Vermont's maple syrup producers in a good year.[13]

Down on the Farm

Dependence on Cars Is Bad for Agriculture.

Agribusiness in California's San Joaquin Valley – a primary source of fruits and vegetables for the entire nation – is a multi-billion-dollar industry. The region's growers complain that vehicle-generated smog reduces crop yields by 20 to 25%.[11] In the Valley's Fresno County – the country's top agricultural producing county – a landmark public-private alliance of farm leaders and representatives from the region's development, conservation, business and local government sectors, has signed a compact for handling the stunning amount of projected growth, while conserving prime land. Two of the alliance's three guiding principles are to "develop livable communities that emphasize pedestrian or transit-oriented design."[12]

Walkability – It's Good for Retail Sales.

There are many models around the country that show clear economic benefits to improving the environment for walking in residential and commercial districts. The cities of Lodi and Mountain View in California and West Palm Beach, Florida, offer three examples of successful strategies for making communities simultaneously more walkable, livable, and prosperous.

CASE STUDY: PEDESTRIAN RETROFIT FOR DOWNTOWN LODI

Downtown Lodi launched a $4.5 million public-private pedestrian-oriented project, including a retrofit of five main street blocks from building face to building face.

On the main School Street, sidewalks were widened, curbs bulbed out at intersections and colored paving stones laid in the new sidewalks and street. A striking gateway was installed, as well as 140 street trees, lighting, benches, and other streetscape amenities.

The city credits the pedestrian improvements, as well as economic development incentives, with the 60 new businesses, the drop in the vacancy rate from 18% to 6%, and the 30% increase in downtown sales tax revenues since work was completed in 1997.

◗ For more information:
Tony Goehring, Lodi Economic Development Director, (209) 333-6700
e-mail tgoehring@lodi.gov web www.lodi.gov

CASE STUDY: CASTRO STREET – THE HEART OF MOUNTAIN VIEW

Like central West Palm Beach (see back page), downtown Mountain View, in Northern California, was left behind by a glut of new automobile-oriented retail development on the suburban fringe. As a result, one 10-story building on Castro Street sat empty and unfinished throughout the 1980s, with guard dogs visible through the smoked-glass windows on the first floor.

In the late 1980s, the city resolved to turn Castro Street into the heart of the city by redesigning it to include, among features, a flexible zone where sidewalk café tables would replace parked cars in the summer. The city located a pedestrian-oriented civic jewel on Castro Street – a new city hall and performing arts center complex with an outdoor plaza.

What followed was $150 million in adjacent private investment including an office-over-retail development flanked by hundreds of attractive homes built at 47 units per acre, and interspersed with pedestrian passages that link Castro Street to a city park.

Today, downtown Mountain View is a regional draw, with bookstores, brew pubs, restaurants – and pedestrians.

◗ For more information:
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City of Mountain View,
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CASE STUDY: TRAFFIC CALMING IN WEST PALM BEACH

Traffic calming projects helped West Palm Beach spur a stunning turnaround in a downtown left behind by new growth on the suburban fringe and increasingly perceived as dangerous, dirty and empty.

The city's first traffic calming retrofit was along 4,500-foot-long Clematis Street, a once-lively main street anchored by a plaza, library and waterfront on one end and a historic train station on the other. By 1993, only 30% of the building space on the one-way street was occupied. Property values ranged from $10-$40/sq. ft, with commercial rents at $6/sq. ft.

The city opened Clematis Street (above) to two-way traffic, narrowed the street at points, raised intersections, and bulbed out the curbs at intervals in a slalom-like pattern to slow traffic. The $10 million project also rebuilt an interactive fountain, restored key buildings, and provided for event spaces.

Property values more than doubled on the street. In 1998, they ranged from $50-$100/sq. ft., with commercial rents at $30/sq. ft., and with more than 80% of building space occupied. The project attracted some $350 million in private investment to the area.

In two nearby neighborhoods (below), the city installed mini-traffic circles in some spots, narrowed the streets, and added speed humps. As traffic slowed, social links between neighbors increased. Trash along the streets disappeared, and the area lost its abandoned look. Between 1994 and 1997, the average sale price for homes there increased from $65,000 to $106,000.

"The city is thriving with an intensity and energy that seems limitless," said city transportation planner Ian Lockwood. "It's about reducing speeds, and safety, but it's really economic-development driven. It has paid for itself, easily."

◗ For more information:
Ian Lockwood, West Palm Beach Transportation Planner, (561) 659-8031
e-mail ilockwoo@ci.west-palm-beach.fl.us

printed on recycled paper

Focus on Livable Communities

Notes

[1] *Valuing The New Urbanism, The Impact of the New Urbanism on Prices of Single-Family Homes*, Mark J. Eppli and Charles C. Tu, 1999, Urban Land Institute.

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[3] *Defining New Limits: Emerging Trends in Real Estate*, ERE Yarmouth and Real Estate Research Corporation, 1998.

[4] *Evaluating Traffic Calming Benefits, Costs and Equity Impacts*, Todd Litman, Victoria Transport Policy Institute, 1999.

[5] *Linking the New Economy to the Livable Community*, Collaborative Economics, 1998.

[6] *Profiles of Business Leadership on Smart Growth, New Partnerships Demonstrate the Economic Benefits of Reducing Sprawl,* National Association of Local Government Environmental Professionals (NALGEP), 1999.

[7] *The Ahwahnee Principles for Smart Economic Development*, LGC, 1998.

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[9] "Freeway Tie-Ups Cost $1.1 Billion, Study Says," *Los Angeles Times*, 4/13/00.

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This project is funded by the Physical Activity and Health Initiative, California Department of Health Services under a Preventive Health Services Block Grant from the U.S. Centers for Disease Control and Prevention. Work performed as part of a UC San Francisco contract.

NEWS RELEASE

Hon. Doris O. Matsui

Member of Congress

www.house.gov/matsui/

Serving California's 5th District

FOR IMMEDIATE RELEASE
Thurs., May 1, 2008

CONTACT: Lauren Smith
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Rep. Doris Matsui Introduces Complete Streets Legislation

Bill Will Increase Options for Travel, Make Roads Accessible to Cyclists and Pedestrians

WASHINGTON, D.C. – Today, Rep. Doris Matsui (CA-05) introduced the Safe and Complete Streets Act of 2008 to make the nation's roadways accessible to alternate modes of transportation. Complete streets are designed and operated to enable safe access to motorists, pedestrians, cyclists, and riders of public transit.

"Once again, gas prices have hit record highs this week. As American families continue to feel the pain at the pump due to the skyrocketing costs of gasoline, they are driving less and less. By diversifying our roadways, we can provide real alternatives to travel by car," said Rep. Matsui.

The Safe and Complete Streets Act would require states that receive federal funding for their road improvement projects to implement complete streets policies. These policies ensure that any new road construction or rehabilitation efforts would accommodate the safety and convenience of all users of the transportation system.

The bill does not try to establish a one-size-fits-all policy. Instead, it accounts for variation from one locale to the next by requiring the projects to fit within the local community context. It also provides for clearly-established guidelines wherein a single project could be exempted from the complete streets guidelines, such as cases of the cost of implementing them would be prohibitive.

"We have very real challenges facing our country, and they are all interwoven. We now know that we must change our environmental and energy policy, and reduce our impact on the planet. By opening up our roadways to pedestrians and cyclists, we can help ease the congestion on our nation's roads," said Rep. Matsui.

The benefits of complete streets principles are well-documented and broad in scope. Complete streets:

- help increase the capacity of the transportation network by giving people more choices about how they travel
- are cost-effective infrastructure investments, and help avoid costly retrofits
- improve pedestrian safety for the nearly one-third of Americans who do not drive

- encourage healthy and active lifestyles
- fight climate change and reduce greenhouse gas emissions by encouraging people to drive less

"We cannot continue our current course, placing undue burdens on our infrastructure and environment. We must take innovative steps to change how we live our daily lives, and ensure that we hand over a sustainable planet to the next generation," said Rep. Matsui.

The Safe and Complete Streets Act enjoys broad support:

"AARP greatly appreciates Representative Matsui's leadership in introducing Complete Streets legislation. Complete streets are safer and more user-friendly for everyone and help people of all ages and abilities stay safely connected to their communities."

- David Sloane, Senior Vice President of AARP

"The Safe Routes to School National Partnership is extremely grateful that Rep Matsui has introduced complete streets legislation. This bill will increase safety on our nation's roads for pedestrians, bicyclists and motorists, and will help children, who are among the most vulnerable roadway users."

- Deb Hubsmith, Director of Safe Routes to School National Partnership

"Complete streets will help people shift short auto trips to walking and bicycling, and that's essential for reducing pollution and carbon emissions. We're very pleased to be working with Congresswoman Matsui on this legislation, and we appreciate her leadership on this important public health issue."

- Larry Greene, Executive Director of the Sacramento Metropolitan Air Quality Management District

"We commend Rep. Matsui for recognizing the importance of making the best investment possible with our federal transportation dollars. States and cities across the country have discovered that completing their streets for all users means safer communities that invite walking, bicycling, and taking transit – and that can help people cope with the rising price of gasoline."

- Barbara McCann, Coordinator of the National Complete Streets Coalition

The Safe and Complete Streets Act is supported by:

AARP, America Bikes, America Walks, American Planning Association, American Public Transportation Association, American Society of Landscape Architects, Association of Pedestrian and Bicycle Professionals, Breathe California, California Park and Recreation Society, California WIC Association, Disability Rights Education and Defense Fund, Easter Seals, Friends of the Earth, League of American Bicyclists, Local Government Commission, National Center for Bicycling and Walking, National Recreation and Parks Association, Prevention Institute, Reconnecting America, Sacramento Area Bicycle Advocates, Safe Kids Greater Sacramento, Safe Routes to School National Partnership, Smart Growth America, Strategic Alliance for Healthy Food and Activity Environments, Surface Transportation Policy

Partnership, Thunderhead Alliance, Transportation Alliance, Transportation Equity Network, Transport Worker's Union, Transportation and Land Use Coalition, Trust for America's Health, WALKSacramento, YMCA of the USA

###

The Complete Streets Act of 2008 (S. 2686)

What the Bill Does:

The Complete Streets Act of 2008 would add a provision to Title 23 to ensure that future transportation investments made by state Departments of Transportation and Metropolitan Planning Organizations create appropriate and safe transportation facilities for all those using the road – motorists, transit vehicles and riders, bicyclists, and pedestrians of all ages and abilities.

More than 50 jurisdictions spanning all regions of the country have adopted complete streets policies that direct transportation planners to consider the needs of all users when transportation investment decisions are made. They ensure streets don't create barriers for children, disabled users, older persons, or those who do not drive. They make sure that roads are designed and updated to allow everyone to travel safely.

The Complete Streets Act of 2008 builds on these existing successful state and local policies to define effective complete streets policies, and to direct state DOTs and MPOs to adopt such policies and apply them to upcoming transportation projects. The bill also authorizes needed research and dissemination of complete streets best practices.

The Complete Streets Act of 2008 was introduced by Senators Harkin and Carper and has been referred to the Senate Committee on Commerce, Science, and Transportation.

The Benefits of Complete Streets

Complete Streets **fight climate change** and **reduce our dependence on foreign oil**– they are essential if we are serious about helping people drive less and **save money on gas**. The 2001 National Household Transportation Survey reveals that 50% of all trips in metropolitan areas are three miles or less, 28% of all metropolitan trips are one mile or less – distances easily traversed by foot or bicycle. Yet 65 percent of those trips under one mile are now made by automobile, in part because of incomplete streets that make it dangerous or unpleasant to walk, bicycle, or take transit. Complete streets policies should be an element of the nation's strategy for addressing climate change and energy security. As gas prices rise, complete streets help people avoid the pain at the pump.

Complete streets **improve pedestrian safety.** About one-third of Americans do not drive, including an increasing number of seniors and low income Americans who cannot afford cars. Yet just like everyone else, they require access to a variety of other transportation options in order to get to work, school, shops and medical visits, and to take part in social, civic and volunteer activities. In 2006, nearly one quarter of pedestrian fatalities were children (8 percent) and older adults (15 percent)[1]. Designing the street with pedestrians in mind -- sidewalks, raised medians, better bus stop placement, traffic-calming measures, and treatments for disabled travelers -- may reduce pedestrian risk by as much as 28%[2].

Complete streets can help **increase the capacity of the transportation network** by giving people more choices. The Texas Transportation Institute found that providing more travel options, including public transportation, bicycling and walking facilities, are important elements in reducing congestion[3].

Complete Streets direct **a better use of taxpayer dollars.** In Illinois, the statewide complete streets law was passed last year to avoid unnecessary expense. Lawmakers had heard the story of a bridge near Cary, Illinois that was built without any safe way to cross it via foot or bicycle. After several deaths, and a successful wrongful-death lawsuit filed by the parents of a teenager killed on the bridge, the state DOT had to go back at great expense and retrofit the existing bridge, adding a path to the span. It would have far less expensive to do it right, the first time.

Complete streets **encourage healthy and active lifestyles**. One study found that 43% of people with safe places to walk within 10 minutes of home met recommended activity levels, while just 27% of those lacking safe options were active enough[4]. Nearly one third of transit users meet the Surgeon General's daily activity recommendations just through their routine travels[5].

Groups supporting federal complete streets policies:

AARP
America Bikes
America Walks
American Planning Association
American Public Transportation Association
American Society of Landscape Architects
Association of Pedestrian and Bicycle Professionals
Bikes Belong
Campaign to End Obesity
Disability Rights Education and Defense Fund
Easter Seals
Environmental Defense
Friends of the Earth
League of American Bicyclists
National Association of REALTORS
National Center for Bicycling and Walking
National Recreation and Parks Association
Natural Resources Defense Council
Rails to Trails Conservancy
Reconnecting America
Safe Routes to School National Partnership
Smart Growth America
Surface Transportation Policy Partnership
Thunderhead Alliance
Transportation Equity Network
Transport Worker's Union
Trust for America's Health
U.S. Public Interest Research Group
YMCA of the USA

[1] Fatality Analysis Reporting System, Bureau of Transportation Statistics
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FOR IMMEDIATE RELEASE
5/1/2008

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Rep. Matsui Introduces Complete Streets Bill in US House;
Sen. Coleman signs on in Senate

Representative Doris Matsui (D-CA), took an important step for safer, better designed streets today by introducing the Safe and Complete Streets Act of 2008 into the US House. The bill would make sure that roads built and improved with federal funds safely serve everyone using the roadway – including pedestrians, people on bicycles or those catching the bus, as well as those with disabilities.

"Once again, gas prices have hit record highs this week. As American families continue to feel the pain at the pump due to the skyrocketing costs of gasoline, they are driving less and less," said Rep. Matsui. "By diversifying our roadways, we can provide real alternatives to travel by car."

Meanwhile, Senator Norm Coleman (R-MN) signed on this week as first Republican co-sponsor of the Senate version of the bill, S2686, the Complete Streets Act of 2008, introduced a few weeks ago by Senators Tom Harkin (D-IA) and Thomas Carper (D-DE). This is the first time that comprehensive complete streets bills have been introduced in the House and Senate.

"We commend Rep. Matsui and Senators Coleman, Harkin, and Carper for recognizing the importance of making the best investment possible with our federal transportation dollars," said Barbara McCann, Coordinator of the National Complete Streets Coalition. "States and cities across the country have discovered that completing their streets for all users means safer communities that invite healthy walking, bicycling, and taking transit – and that can help people cope with the rising price of gasoline."

Across the country, many transportation agencies have continued to design many roads primarily for drivers – discouraging bicycling and leaving those on foot tramping through a track worn in the grass. Yet men and women outlive their driving years by six and ten years respectively and prefer to walk rather than be stuck at home. Transit users often face dangerous crossings and uncomfortable waits, while people who use wheelchairs or have vision impairments often cannot venture out at all due to a lack of sidewalks and curb ramps. And surveys show Americans of all ages and income levels want safe places to walk and ride bicycles, and public health officials says such activity is an essential component of fighting the obesity epidemic.

Complete Streets policies require transportation planners to take the needs of all users into account in all upcoming transportation projects – so the road network can be gradually improved for everyone. Oregon, Virginia, Illinois, California, and Massachusetts are among the states that have adopted complete streets policies or laws; dozens of counties, regional transportation agencies, and cities and regions have also adopted the policies in the last few years, including Ms. Matsui's home jurisdiction of Sacramento, as well as Seattle, Chicago, and Salt Lake City.

The National Complete Streets Coalition includes AARP, the American Public Transportation Association (APTA), the American Planning Association, Smart Growth America, America Bikes, and many other organizations. For more information, visit www.completestreeets.org.

The Safe and Complete Streets Act is supported by:

AARP, America Bikes, America Walks, American Planning Association, American Public Transportation Association, American Society of Landscape Architects, Association of Pedestrian and Bicycle Professionals, Bikes Belong, Breathe California, California Park and Recreation Society, California WIC Association, Disability Rights Education and Defense Fund, Easter Seals, Friends of the Earth, League of American Bicyclists, Local Government Commission, National Center for Bicycling and Walking, National Recreation and Parks Association, Prevention Institute, Reconnecting America, Sacramento Area Bicycle Advocates, Safe Kids Greater Sacramento, Safe Routes to School National Partnership, Smart Growth America, Strategic Alliance for Healthy Food and Activity Environments, Surface Transportation Policy Partnership, Thunderhead Alliance, Transportation Alliance, Transportation Equity Network, Transport Worker's Union, Transportation and Land Use Coalition, Trust for America's Health, WALKSacramento, YMCA of the USA

# #

Back-in/Head-out Angle Parking

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San Francisco, CA 94103

January 2005

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Introduction

In recent years the use of back-in/head-out angle parking has increased steadily in cities across North America. There are several reasons for this development. Kulash and Lockwood (2003) state that:

"Back-in/head-out diagonal parking is superior to conventional head-in/back-out diagonal parking. Both types of diagonal parking have common dimensions, but the back-in/head-out is superior for safety reasons due to better visibility when leaving. This is particularly important on busy streets or where drivers find their views blocked by large vehicles, tinted windows, etc., in adjacent vehicles in the case of head-in/back-out angled parking. In other words, drivers do not back blindly into an active traffic lane. The back-in maneuver is simpler than a parallel parking maneuver. Furthermore, with back-in/head-out parking, the open doors of the vehicle block pedestrian access to the travel lane and guide pedestrians to the sidewalk, which is a safety benefit, particularly for children. Further, back-in/head-out parking puts most cargo loading (into trunks, tailgates) on the curb, rather than in the street."

The growing presence on American streets of sport utility vehicles (SUVs), with their bulky rear ends and (frequently) tinted windows may have spurred the trend toward back-in/head-out angle parking: when using conventional angle parking, drivers increasingly find themselves beside an SUV, with more difficult sightlines.

This report briefly discusses the design and benefits of back-in/head-out angle parking and shows where the design has already been implemented.

Some examples

In Tucson, AZ, two blocks of reverse diagonal parking have been installed along the University Boulevard Bikeway (see Figure 1), which leads into the west entrance of the University of Arizona (~36,000 students). In the two years of reverse diagonal parking, there have been no accidents along the segment, despite the large number of cyclists using the bikeway.

Figures 2-4 illustrate some of the benefits of back-in/head-out angle parking. In Figure 2 the driver is able access her trunk from the curb rather than from the street. Figures 3 and 4 show that the driver can have eye contact with oncoming traffic, in this case a bicyclist.

Figure 5 shows typical signage used to introduce drivers to back-in/head-out angle parking. For more examples on back-in/head-out angle parking, see Appendices A and B.

Figure 1 Back-in/Head-out parking in Tucson, AZ.

Source: T. Boulanger, Transportation Services, City of Vancouver, WA.

Figure 2 With back-in angle parking you can load your car on the curb, rather than in the street (Vancouver, WA).

Source: T. Boulanger, Transportation Services, City of Vancouver, WA.

Figure 3 An 'eye-to-eye' line of sight between parker and approaching road-user (Vancouver, WA).

Source: T. Boulanger, Transportation Services, City of Vancouver, WA.

Figure 4 The parker's view of the on-coming traffic (Vancouver, WA).

Source: T. Boulanger, Transportation Services, City of Vancouver, WA.

Figure 5 A traffic sign showing the three steps of back-in angle parking, in Kelowna, BC, Canada.

Source: City of Kelowna, British Columbia, Canada.

Advantages

Back-in/head-out angle parking is similar to both parallel and standard angle parking. As with parallel parking, the driver enters the stall by stopping and backing, but need not maneuver the front of the vehicle against the curb. When leaving the stall, the driver can simply pull out of the stall, and has a better view of the oncoming traffic.

Bicyclists

This type of parking provides a safer environment for bicyclists using the roadways. The driver is able to see the cyclist easily when exiting the stall. Several cities where back-in angle parking has been implemented have seen a reduction in number of accidents compared to the number of accidents at regular parallel parking schemes.

Tucson-Pima County Bicycle Advisory Committee says that after implementing the back-in/head-out angle parking scheme in Tucson they "went from an average of 3-4 bike/car accidents per month to no reported accidents for 4 years following implementation."

Visibility

In contrast to standard angle parking the visibility while exiting a back-in/head-out angle parking into traffic is much improved. When the driver is backing up (into the stall), the driver is in control of his lane: traffic behind either waits, or changes lanes.

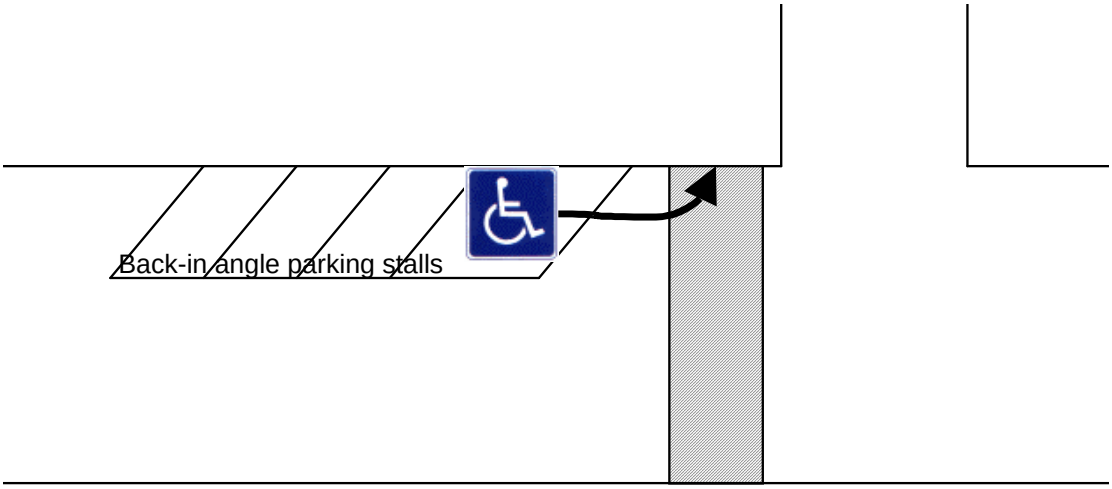
Steep terrain

Back-in angle parking can also be useful on steep terrain: if used on the correct side of the street, it causes drivers to automatically curb their wheels, which in turn prevents runaway autos. Used on the wrong side of a steep street, however, it is likely to cause more runaways.

Disabled parking

In Pottstown, PE, a 13-foot wide handicap accessible stall has been incorporated into the angle parking as the last space, intersection nearside, of each block. This places each disabled parking stall close to the existing curb ramps, and allows the wheelchair-using drivers to unload out of the way of traffic (see Figure 6). By contrast, the street's previous parallel parking arrangement could not be safely used for disabled parking, and conventional angle parking raised safety concerns for the street's proposed bicycle lanes.

Figure 6 A disabled parking stall located right next to the pedestrian crossing and the curb ramp.



Safety

As SLCTrans (2004) states, "one of the most common causes of accidents is people backing out of standard angled parking without being able to see on-coming traffic. Reverse angled parking removes this difficulty." It also improves safety for cyclists, and for loading/and unloading the trunk of the car. Similarly, the *Urban Transportation Monitor*'s recent article on back-in angle parking reported reduced accidents and benefits for bicyclists in several communities. In all, back-in/head-out angle parking is a good choice when compared to conventional head-in angle/back-out parking and parallel parking.

Cities using back-in/head-out angle parking

The list of cities in North America that use back-in/head-out angle parking is growing. Figure 7 lists some of these communities.

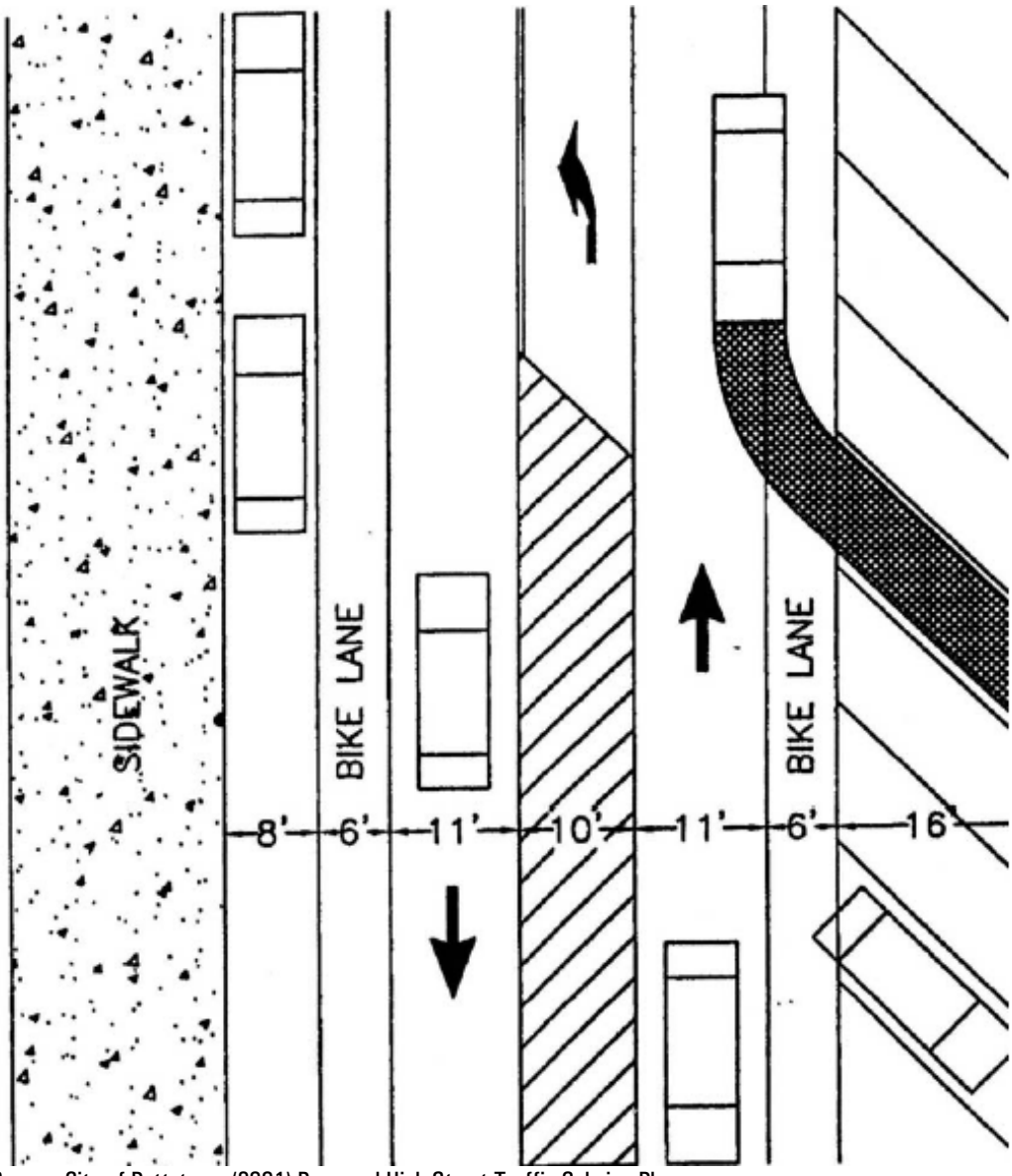
Figure 7 Cities using back-in/head-out angle parking.

City	Source	
Arlington, VI	Dan Burden	Walkable Communities, Inc.
Birmingham, AL	Russ Soyring	City of Traverse City, MI
Burnaby, Canada	Dan Burden	Walkable Communities, Inc.
Charlotte, NC	Dan Burden	Walkable Communities, Inc.
Chico, CA	Patrick Siegman	Nelson\Nygaard
Everett, WA	Michael M. Moule	Livable Streets, Inc
Honolulu, HI	Dan Burden	Walkable Communities, Inc.
Indianapolis, IN	Michael M. Moule	Livable Streets, Inc
Knoxville, TN	Michael M. Moule	Livable Streets, Inc
Marquette, MI	Russ Soyring	City of Traverse City, MI
Montreal, Canada	Michael M. Moule	Livable Streets, Inc
New York, NY	Dan Burden	Walkable Communities, Inc.
Olympia, WA	Dan Burden	Walkable Communities, Inc.
Plattsburgh, NY	Dan Burden	Walkable Communities, Inc.
Portland, OR	Michael M. Moule	Livable Streets, Inc
Pottstown, PA	Michael M. Moule	Livable Streets, Inc
Salem, OR	Todd Boulanger	City of Vancouver, WA
Salt Lake City, UT	Dan Burden	Walkable Communities, Inc.
San Francisco, CA	Michael M. Moule	Livable Streets, Inc
Seattle, WA	Dan Burden	Walkable Communities, Inc.
Tacoma, WA	Dan Burden	Walkable Communities, Inc.
Tucson, AZ	Michael M. Moule	Livable Streets, Inc
Vancouver, WA	Todd Boulanger	City of Vancouver, WA
Ventura, CA	Todd Boulanger	City of Vancouver, WA
Washington, DC	Dan Burden	Walkable Communities, Inc.
Wilmington, DE	Michael M. Moule	Livable Streets, Inc

Typical dimensions

Particularly when accommodating bike lanes within the roadway, back-in/head-out angle parking is useful. Figure 8 shows the cross-section of such a roadway in Pottstown, PA. Appendix C and D shows Vancouver's, WA, and Seattle's, WA, choices of dimensions for this type of parking.

Figure 8 Cross-section of a roadway accommodating both bike lanes and back-in/head-out angle parking.



Source: City of Pottstown (2001) Proposed High Street Traffic Calming Plan.

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SLCTrans, Salt Lake City, UT (2004) Back-in or Reverse Angle Parking - FAQ. http://www.slcgov.com/transportation/Aboutus/FAQ.htm.

Urban Transportation Monitor. Back-in Angle Parking. June 11, 2004, page 1.

APPENDIX A

NAWN, J.A. (2003) CENTRAL BUSINESS DISTRICT BACK IN ANGLE PARKING. *PE REPORTER*, NOVEMBER/DECEMBER ISSUE, P. 11-13.

Central Business District Back In Angle Parking

John A. Nawn, P.E., PTOE

In August 2003, the Pottstown borough completed back in angle parking along the main street thorough its central business district (CBD). This is the first such application of back in angle parking in the Commonwealth of Pennsylvania.

In many community's central business districts, lack of parking close to retail and commercial establishments is seen as a deterrent to continued retail development and reinvestment into the CBD. In many instances, the CBD is also bisected by an urban arterial, or "Main Street." Competing needs of parking versus efficient vehicle movement can impede mobility and sometimes compromise safety.

Since the middle 1990's, the Borough of Pottstown, Montgomery County, Pennsylvania, has struggled to revitalize and reinvigorate its downtown core. The Borough's 1994 Downtown Comprehensive Plan identified several goals for revitalization, specifically dealing with creation of a pedestrian friendly, multi-modal environment while maximizing the amount of parking and its proximity to retail establishments that line the downtown core. Through leveraging of and improvement to the existing transportation infrastructure, the community attempted to realize these goals.

Located in the Philadelphia, Pennsylvania metropolitan area and situated on the Schuylkill River, the Borough of Pottstown traces its routes to 1752. As the Borough developed, the CBD developed centered along High Street, making High Street the Borough's main street. At 5.5 square miles, Pottstown population is 21,859 (2000 census). Following the increase in automobile traffic after World War II, the High Street cross section was reconfigured to maximize automobile mobility. With 68 feet available between the curb lines, two 11-foot through lanes and a 7-foot parallel parking lane were created in each direction along with a 10-foot wide center turn lane/ painted median. Combined with a 16-foot sidewalk on each side, the face of the buildings on each side of the street are 100 feet apart, creating a very wide corridor through the CBD. The width of the corridor is visually perceived by some to be a deterrent to downtown redevelopment.

As a highway facility, High Street was an operational success... however, High Street was failing to meet more recent and progressive economic development and transportation goals.

In 1972, a four lane, grade separated, limited access freeway, U.S. Route 422, was constructed along the opposite side of the river from the Borough, essentially bypassing the CBD and drawing large amounts of the existing through traffic volume from High Street. High Street quickly became an underutilized transportation asset.

As a highway facility, High Street was an operational success. The 85th percentile speeds were within 5 miles per hour of the posted speeds and an attractive level of service was maintained for vehicles. However, High Street was failing to meet more recent and progressive economic development and transportation goals endorsed at local, state, and national levels.

Increasing pedestrian traffic is one of the key objectives in the Borough's efforts to revitalize the CBD. However, High Street's configuration impeded these efforts. With four lanes of rapidly moving traffic, it was neither pedestrian nor shopper friendly. High Street's 68-foot cross-section was intimidating and discouraged pedestrians and shoppers from crossing the street. Pedestrian injuries and deaths were not uncommon. In addition, vehicle traffic along High Street moved too quickly to allow passengers adequate time to identify shopping opportunities and find a parking space.

Downtown business owners identified a perceived lack of parking as a concern. Although metered, parallel parking was available on both sides of High Street throughout the CBD, it was generally 50%

"Back-in" continued on p. 12

"Back-in" continued from p. 11

utilized and, therefore, considered to be insufficient in addressing the potential needs of the downtown businesses, considering the number of vacancies. While a number of small surface lots had been created along High Street, the linear nature of the CBD makes this parking convenient to only adjacent businesses with long walks necessary for all other businesses.

One of the region's transportation goals is to encourage the use of bicycles as an alternative to the automobile. High Street had been designated by Montgomery County as an official Bicycle Route connecting Pottstown with other communities along the Schuylkill River corridor. But, in its former configuration, High Street was not conducive to bicycle travel with no dedicated bike lanes and swiftly moving vehicular traffic.

State and regional plans recognize the connection between revitalizing older communities and solving the problems of traffic congestion on our roads and highways. Encouraging people to live, work and shop in denser, walkable communities fosters the use of existing public transportation, helps reduce sprawl and relieves the pressure on our road system. Creating vibrant downtowns in our cities and smaller urban communities ensures a growing demand for public transportation. Therefore, the general thinking was that reconfiguring and calming traffic on High Street would address Pottstown's own economic development goals and have a positive impact on regional transportation and growth issues.

Clearly if the Borough was to increase pedestrian traffic and attract new business to the CBD, while not reducing available parking, the existing automobile and truck traffic would have to be calmed. The CBD study area generally encompassed a 1.1-mile corridor centered along High Street. Within this corridor, there are 10 signalized intersections. Of those, only two were equipped with pedestrian push buttons; side streets were not actuated; and all signals were uncoordinated, operating on fixed time cycles with side street phases sufficient to also support lengthy pedestrian times required to cross High Street. Improvements would include coordination of the signals and the addition of pedestrian push buttons to improve mobility and support the thorough lane reduction necessary to support additional angle parking.

One method used to provide more parking is creation of traditional, pull-in angle parking. However, in order to properly implement traditional angle parking, a substantial amount of right-of-way is necessary to provide the proper maneuver space for vehicles to back out of the spaces without impeding traffic flow on the adjacent roadway. With traditional angle parking in place on both sides of a main street, the width of the street and subsequently pedestrian crossing distances become excessive, creating a non-unified downtown unattractive to pedestrians; pedestrians who are critical to the success of the retail and commercial establishments in the CBD. At signalized intersections, pedestrian crossing times can be excessive, leading to decreased vehicle mobility and progression. More typically, the width of available right-of-way is insufficient to support angle parking. While the angle of the parking can be reduced to narrow the required width of street, as the parking angle becomes more acute, the angle-parking yield becomes not much more than that with parallel parking. Ideally, angle parking without the wide maneuver space would address the problem.

It was clear that if the Borough wished to leverage additional parking and a friendlier pedestrian environment as a means to revitalize the downtown area, that conventional methods and thinking would not likely meet those goals. The concept of employing reverse angle or back in angle parking was initiated by the Borough's Planning Commission and upon request from the Commission, the Borough commissioned a new study to evaluate the appropriateness of back in angle parking on High Street.

The initial plan was to establish minimum required lane widths for the conventional elements of the roadway cross-section. In accordance with PennDOT's criteria for an urban arterial, the minimum acceptable width for through lanes is 11 feet. The center median/turn lane would remain, as it was critical to maintaining the necessary levels of service. PennDOT's minimum criterion for auxiliary lanes is 10 feet, therefore leaving 36 feet of the 68-foot width available to support the parking and bicycle lanes.

PennDOT has detailed regulations governing implementation of angle parking on state highways and specifies a minimum width for parking and maneuver space. With 36 feet available, it would be possible to implement angle parking on one side of the street only, with 6 feet available for a single bike lane. Downtown stakeholders were not inclined to limit parking to one side of the street. Furthermore, with parking provided on only one side of the street, the question was raised as to how drivers proceeding in the opposite direction would be able to utilize the spaces. There was little interest in reducing the angle of the spaces as the additional yield, as noted previously, was not sufficient to justify the installation of the angled spaces.

Having determined that angle parking would likely only be possible on one side of the street, the decision was made retain parallel parking on the opposite side. It was also determined at this point to set a minimum width for the bicycle lane, in accordance with AASHTO criteria, which

recommend a width for two directional travel of 12 feet. This width was also consistent with PennDOT's criteria. With all the other minimum widths established and agreed upon, this left 18 feet for angle parking.

In order to maximize the amount of parking, it was decided to utilize an 8 foot, 6 inch (2.59 meter) wide space, which is consistent with National Parking Association (NPA) criteria for a 45-degree angle space. The available 18-foot width, however did not meet PennDOT's minimum criteria. The design team, lead by John A. Nawn, P.E., PTOE, in meetings with the Department, pointed out that PennDOT standards did not specify whether the angle parking criteria applied to traditional pull in or back in angle parking, and since there were no examples of back in angle parking in Pennsylvania, it was clear that the PennDOT criteria only applied to pull in angle parking. It was agreed that a maneuver area was necessary for traditional pull in angle spaces so vehicles can re-enter the roadway safely. When backing up from a pull in angle space, an operator temporarily has no view of approaching traffic dependent upon the length of his or her vehicle and the length and composition of the vehicle to the right. The maneuver area is necessary to provide the operator a safe place to back into during this essentially blind reverse maneuver. However, with back in angle parking, it was argued that no such maneuver area was necessary since vehicles exit forward.

The human biomechanical motion necessary to enter a back in angle parking space is similar too, if not easier than entering a parallel parking space. The prescribed method for entering a parallel parking space entails three distinct steps. First, the operator pulls past the parking space. Second, the operator proceeds in reverse into the space, on a diagonal, as far as possible. Third, the operator pulls forward while turning toward the right to bring the vehicle parallel to the curb. The second step, wherein the operator pulls backwards into the parallel space, typically places the vehicle at an approximate 45-degree angle with the travel lane. For a 45 degree back in angle space therefore, the operator only needs to complete the first two steps of the typical parallel parking maneuver wherein the operator pulls past the space, than proceeds in reverse into the space, completing the move. When leaving the space to re-enter the highway, the back in angle space has a clear advantage over the parallel parking space. When exiting a parallel parking space, an operator must turn his or her field of vision up to 180 degrees and look backward to be able to view approaching vehicles and identify gaps in which to re-enter the traffic stream. In pulling out from a 45 degree angle space, the maximum that the operator must turn his field of vision is 135 degrees to be able to see approaching vehicles from his left. This movement requires only that the operator turn sideways, not backwards presenting a slightly more 'comfortable' position for the operator.

Based on the above discussion, it was successfully presented to the Department that given the fact that it is theoretically easier to enter and exit a back in angle parking space than a parallel parking space, and no maneuver area is typically required for parallel parking lanes in an urban zone, accordingly, no additional maneuver area would be necessary nor should be required for back in angle parking.

The proposed layout was approved by the Borough Council and endorsed by three local, downtown organizations, and the County. The plan was also conditionally approved by PennDOT. Design of the project was funded partially by a grant from the Delaware Valley Regional Planning Commission (DVRPC), through their competitive Transportation and Community Development Initiative (TCDI) program. Implementation of the re-designed striping was carefully orchestrated to follow a planned maintenance resurfacing of High Street.

The decision as to which side of the street to locate the back in angle parking on was cause for much discussion among the stakeholders. Ultimately, the decision was based entirely on which side would yield the biggest increase in parking, and that was found to be the north side of High Street. The additional parking yield over the existing parallel parking, per block, varied greatly depending on the location of driveways, no parking zones and the like, with some blocks gaining as many as 23 spaces and some blocks as few as 2 spaces. Overall, the downtown area gained a total of 95 new spaces, a 21% increase over existing conditions.

In addition to parking changes, existing electromechanical signal controllers were replaced with new, solid state controllers and coordinated with each other to accommodate the through lane reduction necessary to accommodate the new parking and bike lane.

This context sensitive solution demonstrates that back in angle parking can be effectively integrated into the downtown environment and co-exist along an arterial highway employing current, minimum design standards. In addition to creating more parking over traditional parallel parking, back in angle parking can also be used as a traffic calming/street narrowing tool, can enhance pedestrian functionality and walk-ability within the downtown area and can work harmoniously with bicycle lanes, all resulting in a more attractive and intimate downtown corridor enhancing the downtown experience and leading to increased economic investment. ■

John A. Nawn, P.E., PTOE was the Project Manager for the Back In Angle Parking design and installation and had been associated with the project and the Borough's efforts since 1995. Mr. Nawn holds a Bachelor of Science Degree from Drexel University, and is currently employed by URS Corporation the Branch Manager of their Philadelphia Office. John, a licensed professional engineer in four states and a certified professional traffic operations engineer, has over 16 years experience in traffic engineering and has been a member of PSPE since 1990. John is currently the President of the Delaware County Chapter of the Pennsylvania Society of Professional Engineers.

The project was presented at and appears in the proceedings of both the Second Urban Street Symposium (a Transportation Research Board conference) and the 2003 Institute of Transportation Engineers Annual Conference.

For more information please contact Mr. Nawn at, 215-587-9000 x3000 or john_nawn@urscorp.com.

APPENDIX B

CITY OF POTTSTOWN (2001) PROPOSED HIGH-STREET TRAFFIC CALMING PLAN.

1. Wilmington, Delaware

Contact person: Thomas Warrington
Department of Public Works
900 E 11th ST
Wilmington, DE 19802
302.571.4233

The City of Wilmington, Delaware, has six blocks of 60 and 90-degree back-in angle parking dating back about 50 years. By city ordinance, Wilmington requires all angle parking to be backin because of the safety factor.

For 60-degree angle parking, regulations require 19 feet out from the curb for parking spaces, to allow for vehicles with extended cabs, plus a minimum of 11 feet for a travel lane, for a total of 30 feet for traffic going in one direction.

The highest average daily traffic for any block with angle parking is the 1000 block of Market Street, with an ADT of 6,500 vehicles. Wilmington has not experienced any significant problems with accidents or impediments to travel flow with angle parking.
(See attached letter from Thomas Warrington.)

2. Seattle, Washington

Contact person: Bill Jack
Seattle Transportation
Municipal Building, Room 410
600 Fourth Avenue
Seattle, WA 98104
206.684.8329.

The City of Seattle, Washington, has about 280 blocks of angle parking spaces, most of which are back-in. Seattle also has pull-in angle parking, but prefers back-in angle parking because it is safer, especially for pedestrians.

North Queen Anne Street, shown above, is one of the higher volume traffic streets, with about 6,500 ADT.

Seattle has had back-in angle parking for more than 30 years.
(See attached letter from Bill Jack.)

3. Washington, D.C.

Contact person: Rashid Sleemi
202.671.1573

Washington, D.C. has six blocks of back-in angle parking going back 15 to 20 years.

The busiest thoroughfare is the 2400 block of 18th Street NW, which has an ADT of 9,200. The street has two lanes of traffic going in each direction with no maneuver lane in front of the parking spaces.

Other areas with back-in angle parking are several blocks on Water Street, NW, a low volume traffic area, and Vermont Avenue, NW, between 14th and Q streets, with an ADT of 5,000.

Although no traffic records are available, Mr. Sleemi reports the perception is that back-in angle parking does not create any traffic hazards.

4. Indianapolis, Indiana

Contact person: John Burkhardt
Administrator, Traffic Division
1725 S. West Street
Indianapolis, IN 46225
317. 327.2903

Indianapolis has one block of back-in angle parking, along the federal courthouse on New York Avenue, going back at least 15 years.

New York Avenue is a one-way street consisting of a north parallel parking lane, three traffic lanes, a right turn lane, and angle parking. The right turn lane is directly adjacent to the angle parking. Average daily traffic is 13,800.

The latest traffic records, for the years 1999-2000, reflect there were a total of two accidents over two years at the nearest intersection. They do not know if those accidents had anything to do with the angle parking.