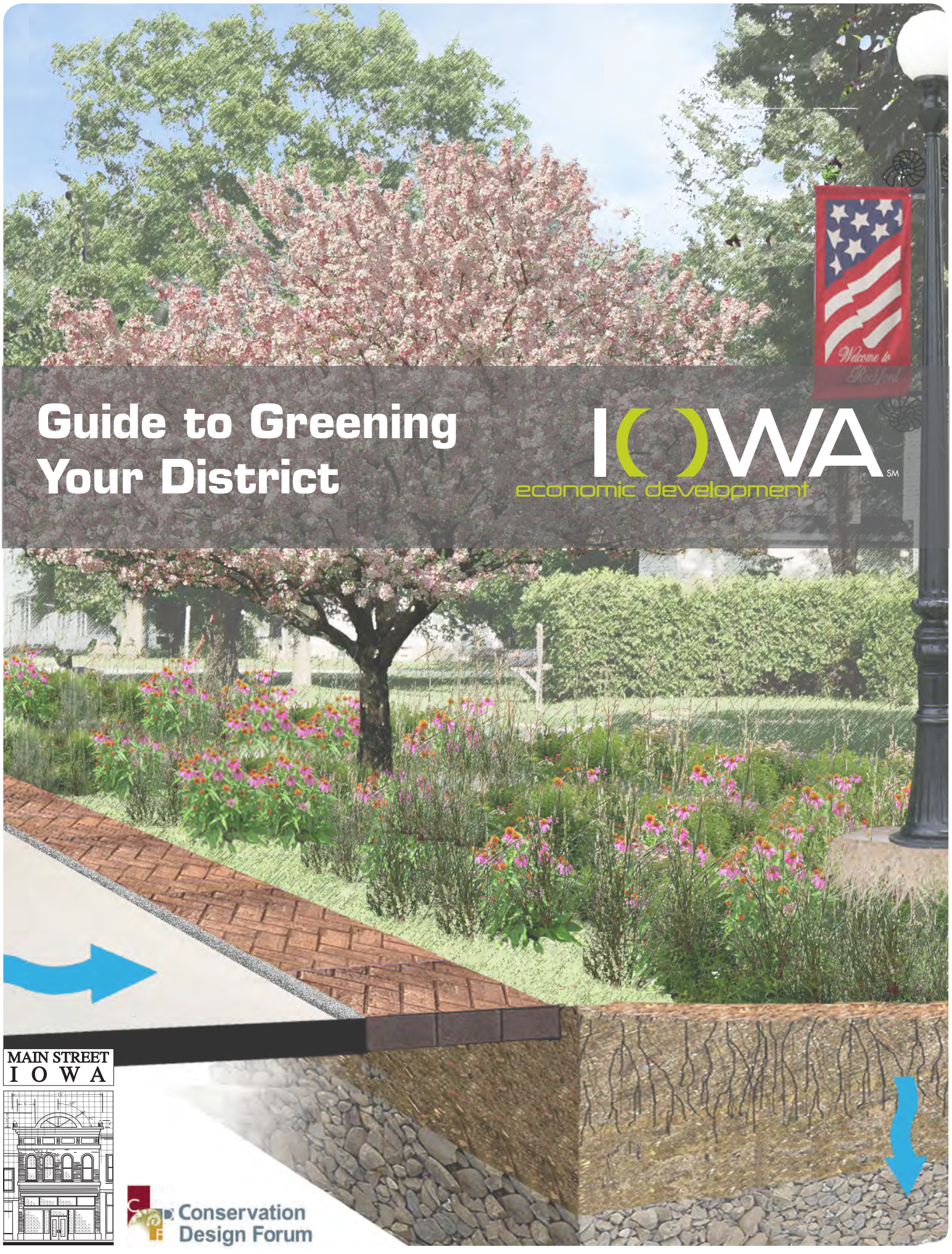
Guide to Greening Your District

IOWA economic development



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Conservation Design Forum

Acknowledgements

Main Street Iowa program, a housed within the Iowa Economic Development Authority (IEDA), works to improve the social and economic well-being of Iowa's communities by assisting selected communities to capitalize on the unique identity, assets and character of their historic commercial district. Main Street® is economic development within the context of historic preservation.

Visit the Main Street Iowa website: iowaeconomicdevelopment.com/community/mainstreetiowa/

IEDA's Green Streets Initiative continues to position the state to be a leader in sustainable development by providing the opportunity for Iowa communities to take advantage of emerging market transformation as more communities and private entities emphasize "going green". This initiative includes providing training resources to local Main Street programs to better understand how sustainable practices can be implemented in historic commercial districts, including the Greening your District training project with Conservation Design Forum.

Visit IEDA's Green Streets Initiative website: iowaeconomicdevelopment.com/community/green_initiatives.aspx

Conservation Design Forum (CDF) is a nationally recognized planning and design firm that was contracted by IEDA to deliver the Greening your District training program, including working sessions with 22 Main Street communities. With over 15 years of sustainable design and development experience, CDF combines current research, innovation, and collaborative problem-solving to achieve successful design solutions. The team at CDF includes a diverse group of professionals with expertise in landscape architecture, planning, environmental science, and civil and water resource engineering. With projects ranging from urban to rural, and from the site to the watershed scale, CDF can provide complete design and engineering services for a variety of projects, from initial evaluation and visioning through construction observation and post-occupancy monitoring.

Visit the Conservation Design Forum website: conservationdesignforum.com/

This Guide to Greening your District was created by Conservation Design Forum for the Iowa Economic Development Authority / Main Street Iowa with support of a USDA Rural Development Grant. The Iowa Economic Development Authority is an intermediary of USDA assistance.

Guide to Greening your District

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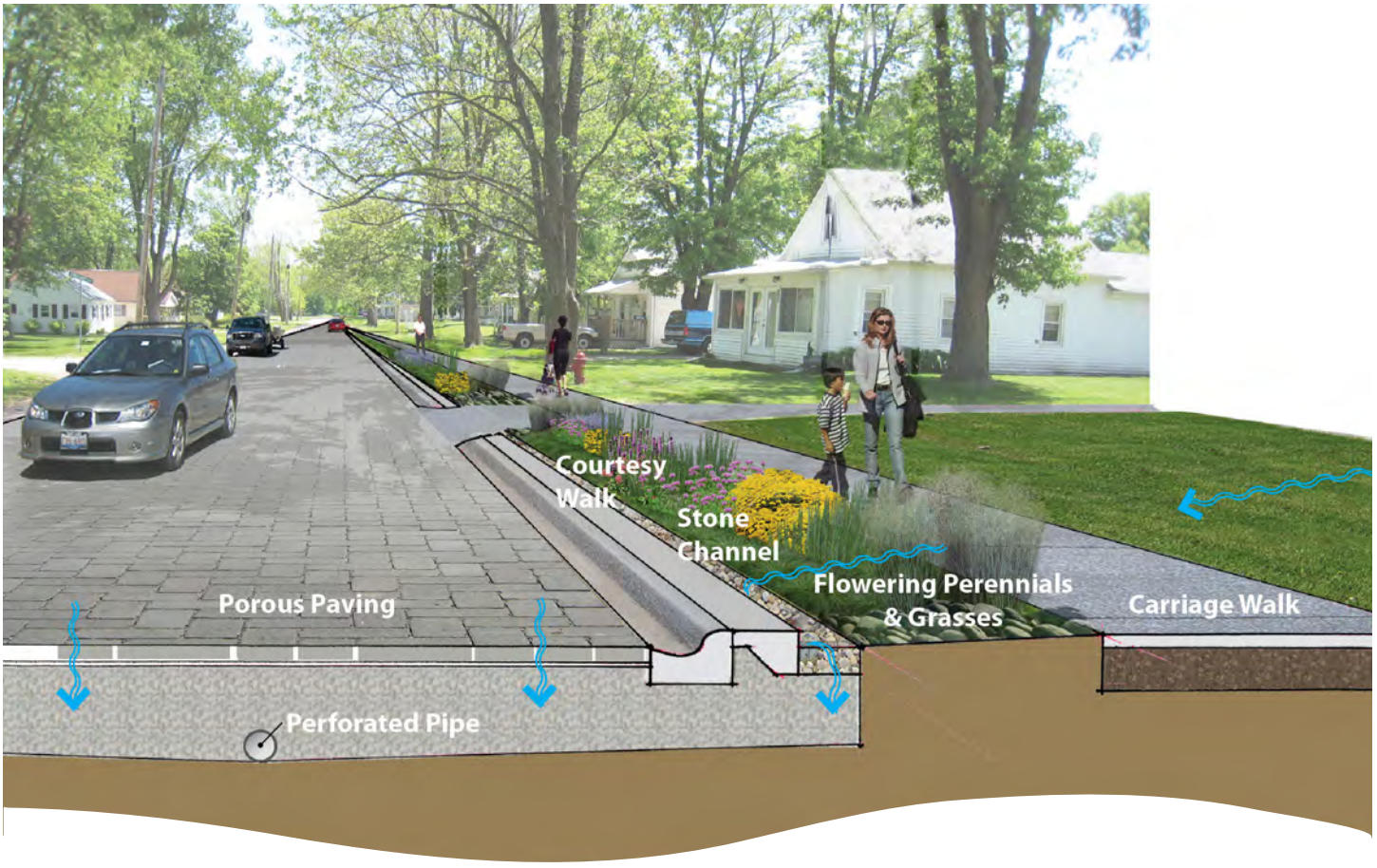
1. Introduction

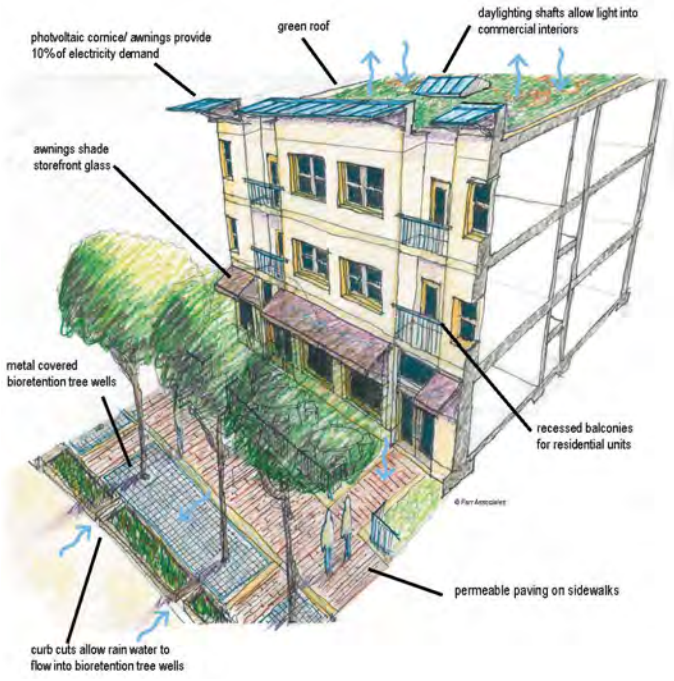
The Greening your District training is intended to provide information and resources to Main Street communities throughout Iowa regarding green - or sustainable - approaches to building or re-constructing public spaces within historic commercial districts (downtowns), including streets, sidewalks, alleys, and parks to provide a wide range of benefits. This approach relies on the integrated application of leading–edge, green practices in buildings, pavement, utilities, landscapes, lighting, furnishings, and urban design. Proper application of green practices can benefit communities in a number of ways including job creation, economic development, reduced energy costs, a healthier environment, and safer, more enjoyable streets and neighborhoods. When integrated with other best practices, such as an emphasis on mixed-use, walkable, pedestrian-friendly planning, appropriate, urban-scale architecture, and market-sensitive retail planning, these green practices create the greatest long-term value. Reduced maintenance and replacement costs, more viable downtown businesses, and attraction of new businesses are some of the potential benefits that have been observed in places that have implemented green streets and public places.

This guide describes the integration of these practices into historic commercial districts common in the communities that participate in the Main Street Iowa program. Retrofitting these districts presents a set of challenges and opportunities that are different from development in a vacant or otherwise undeveloped area. Downtown improvement and beautification projects lend themselves to the integration of green practices that fit seamlessly into the public streetscape.



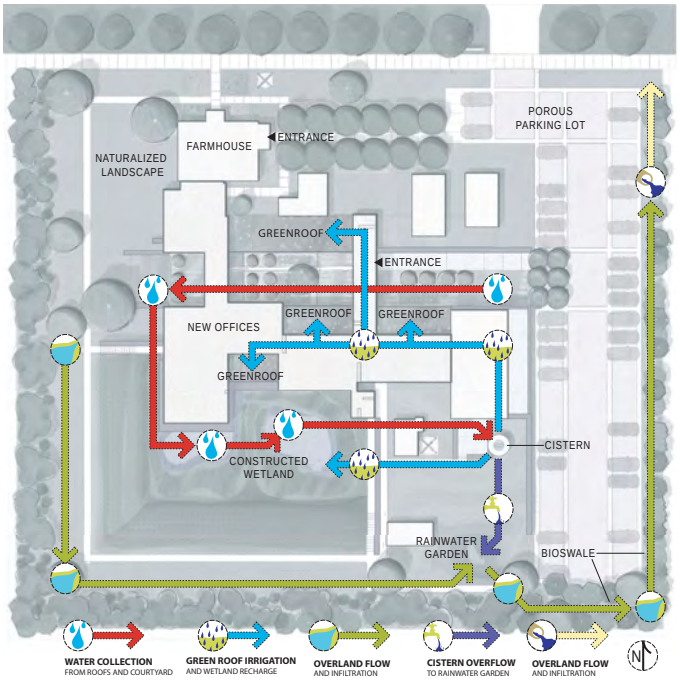
II. Infiltration-based Rainwater Approach

Many communities are faced with impacts and costs associated with managing stormwater runoff, including ponding, flooding, and the installation, maintenance, and replacement of a stormwater conveyance system (ditches, pipes, and detention ponds). An overall infiltration-based stormwater management approach could maximize the funds allocated for stormwater management and treatment, reduce the need and size of traditional storm sewer systems, and achieve multiple benefits. These include reduced flooding, improved water quality, reduced discharge of polluted runoff to streams and rivers, and longer lasting, better performing streets, sidewalks, and alleys. Infiltration practices include porous, decorative paving, rain garden planters, and bio-infiltration practices integrated within parkways and medians. These practices can be installed within or adjacent to nearly any street, alley, parking lot, or other paved, impervious surface to help capture and infiltrate rainwater runoff. Examples of this approach can be seen in West Union and Charles City, Iowa, where multiple blocks and streets have been reconstructed using infiltration practices.



III. Integrated Systems

The most effective systems, from a cost and performance perspective, include multiple components designed to be constructed and to function in concert with one another rather than as single-purpose, isolated elements. Green or high-performance buildings, sites, and infrastructure systems can be planned and engineered to work together, even if they can not all be built at the same time. An example of integrated systems would be the harvesting of rooftop rain water and air conditioner condensate for use in manual or automatic landscape irrigation, or even for indoor toilet flushing and other non-potable water needs. Another example would be porous pavement systems engineered to slow, cool, cleanse, and infiltrate rainwater, reducing the need for traditional storm sewers, improving water quality, and providing a longer-lasting, more durable and beautiful streetscape.



IV. Green Infrastructure Practices

Green Infrastructure practices include strategies for improving the appearance, function, and quality of life of historic downtown districts in Iowa communities. Practices 1 through 4 address water and energy systems, practices 5 through 7 consider amenities and furnishings, and practices 8, 9, and 10 are focused on the wise use of land.

1. Green Roofs

Most historic commercial districts consist of a few blocks of side-by-side, one or two story buildings that create a virtually continuous plane of rooftops, unused space that could be repurposed to help manage rain water, reduce energy use for building heating and cooling, extend the replacement cycle of roof structures and materials, and provide additional greenery to the urban landscape. Some building owners incorporate outdoor patios, seating areas, and gardens on rooftops to provide additional usable space for building occupants during warmer months.

Green roofs are vegetated roof system designed to intercept, cleanse, and retain rainwater runoff on the top of buildings. Green roofs consist of a growing medium and are generally planted with drought tolerant vegetation to withstand harsh conditions on rooftops. The soil and vegetation release captured precipitation to the atmosphere, which reduces the amount of runoff flowing to streams and rivers.

Green roofs can be installed on new and existing buildings within the historic commercial district. In fact, many historic buildings have sufficient roof structures that can support more intense green roof systems; however, a structural analysis should always be done to determine the load bearing capacity of the existing roof. For new buildings, the decision to include a green roof should be made at the outset of a design process so that the roof can be designed to support the additional weight of the green roof.

The cost of a green roof (typically between $5 and $25 per square foot, depending on design details) is somewhat higher than a conventional, non-green roof, however, greater long-term value and lower life-cycle costs can result from the integration of green roofs into the overall building program. Capital and operational cost savings for building owners can be achieved through the use of green roofs due to increased roof insulation and cooler surface temperatures in summer months, reducing the size of mechanical systems needed to cool the building. Reducing rainwater runoff can reduce or eliminate the need for costly stormwater infrastructure. Also, green roof/rooftop terrace space can add usable square footage to the building, enhancing its attractiveness for second and third floor residents, offices, and restaurants.

2. Porous Paving

Historic commercial districts consist of expanses of paved surfaces that create rain water runoff, which carries urban pollutants into local streams and rivers and contributes to flooding problems downstream. In cases where aesthetics, stormwater infiltration, and long-term durability are important, impermeable paving can be replaced with permeable or perforated paving materials or pavers that allow rain water to flow through the paving surface into underlying layers of gravel and soil. These systems can help reduce runoff volume, reduce flooding and ponding during heavy rainfall, and improve water quality. Pavers also provide a much more flexible material as it relates to integrating creativity and artistry into the paved surface, whether through design, orientation or color.

Interlocking concrete (or clay) unit pavers, the most common and available type of permeable pavement, are modular systems containing openings filled with gravel or rock chips. Porous concrete and asphalt, which contain pore spaces that allow water percolation, are less common and don't offer some of the benefits the pavers provide, including durability, flexibility, and design creativity.

Within historic commercial districts, permeable pavers are appropriate for most paving applications including streets, parking lots, alleys, sidewalks, access roads and lanes, and driveways. In fact, the aesthetic of permeable pavers is very similar to the brick pavers used as some of the first paving materials in these historic districts, and the installation of pavers can restore some historic character to these places.

Porous, interlocking unit paving is very cost-competitive to traditional reinforced concrete and asphalt pavement, in the range of $5 to $10 per square foot installed. A 3,000 square foot parking lot, for example, can cost in the range of $20,000. Porous unit paver systems, however, last much longer than asphalt and concrete and require less maintenance, reducing long-term life-cycle costs. Maintenance for paver systems includes regular inspection and annual sweeping/vacuuming to remove fine particulate matter that can obstruct pore spaces. Another advantage of a porous unit paving system is the ability to more easily access underground pipes and utilities for maintenance, repair, or replacement.

3. Bioretention (Bioswales + Raingardens)

Some of the historic commercial districts in Iowa lack vegetation and greenery that, if integrated, can significantly improve the appearance of the streetscape. Fortunately, there are numerous ways to incorporate vegetation adapted to the Iowa climate and urban environmental conditions, including ornamentals, native plants, or a combination, into downtown areas in a way that provides multiple benefits to the community. Parkway gardens, tree wells, curb bump outs, and planter boxes can be designed as vegetated stormwater bioretention features to allow water to percolate through the soil and potentially a rock sub-base. These practices retain, cool, and cleanse rain water before being discharged to sewer systems or nearby water bodies.

These vegetated practices, which often look like simple landscaping beds but include depressions to intercept and infiltrate rain water runoff, and can be installed within or adjacent to nearly any paved or other impervious surface. For example, planter boxes can be installed along the edges of buildings to capture roof runoff from downspouts. Planting beds can be installed within or along the edges of parking lots and in curb bump-outs to capture runoff via curb cuts or drains. Regardless of their location, vegetated bioretention features that attract birds and butterflies can help put people in closer proximity to nature.

Bioretention plantings can vary in appearance, from natural and organic to formal and architectural. The key to good design is to select vegetation according to soil and water conditions, surrounding context, and maintenance requirements. Including native plants with deep root systems and other vegetation adapted to Iowa climates and tolerant of urban environmental conditions within the planting design will best facilitate stormwater infiltration. It is also essential to plan for the long-term care and maintenance of living landscapes to ensure they remain both functional and beautiful over time. Weeding, watering, thinning, and replacement of dead or diseased plants are all regular maintenance requirements of every garden landscape. While these and other maintenance activities can be minimized through the design approach, they cannot be eliminated. Installation costs for bioretention systems can range from $3 per square foot for simple designs, and up to $40 per square foot for more complex systems. The conversion of a three block (12,000 square feet) boulevard median to a bioswale system in Rockford, Iowa is projected to cost approximately $250,000 including trees, lighting, and a brick paver decorative edge. Maintenance for bioretention beds includes occasional weeding and supplemental planting typical for most planting beds.

4. District Energy Systems

Buildings within historic commercial districts are typically served by regional utility providers and individual HVAC systems. While these systems provide reliable services to business owners, district energy systems that use renewable energy as the source can provide:

- greater energy efficiency
- lower long term costs
- lower dependence on fossil fuels
- lower greenhouse gas emissions
- local energy security and control over energy sources

Within the context of a historic downtown commercial district, it is likely that geothermal (also known as ground-source) would be the most efficient and effective long-term renewable energy source for heating and cooling. Geothermal heating and cooling uses constant 50 to 55 degree ground temperatures to heat or cool water that is circulated through buildings. Heating systems need only heat buildings from this baseline of 50 degrees to the desired temperature of 68 degrees rather than from 30 degrees or colder typical of Iowa winter months, thereby saving energy and money and reducing the size of heating and cooling units. Similar savings are realized for cooling systems.

One of the other advantages of a district geothermal system in a downtown district is the ability to site well fields in public spaces - streets, alleys, parking lots, and parks. This provides individual building owners access to efficient, low-cost, reliable renewable energy in a downtown setting.

The best time to plan for and install a district energy system is during major street reconstruction projects, which is also the best time to evaluate the renewal or replacement of other utility infrastructure. Costs to install and operate a system that serves multiple buildings depend on the size and design of the system, the source (like solar, geothermal, biomass, or wind), the level of participation (when more users connect to the system, the cost per user drops), and other factors. The most significant cost savings are realized following the payback period, which also depends on many factors. A geothermal heating and cooling system in West Union, Iowa, for example, projects a 15 year payback period for the initial investment based on 60% participation.

5. Signage + Wayfinding

Historic commercial districts often include historic buildings or other culturally relevant elements that are unique and differentiate towns from one another. These districts are also crossroads for travelers moving between destinations or seeking out places within the community itself.

Informational and directional signage installed within these communities can identify key landmarks and destinations, historic buildings, as well as green infrastructure features. Kiosks and other signage should incorporate local logos or other consistent design themes and avoid flashing, animated, rotating or otherwise moving components. They can also use local craftsmanship, integrate materials that are locally found and produced, and be constructed of recycled and recyclable materials.

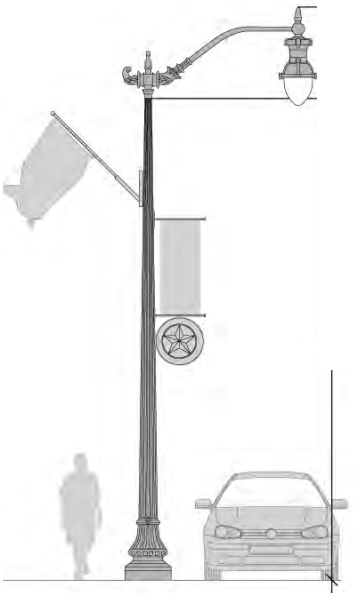
Wayfinding signage that is tailored to pedestrians can supplement existing street signs, which are usually designed for motorists. Custom wayfinding signage can link together distant sites and reinforce a regional and local identity in a way that standard street signs cannot. Signage can highlight local assets and attractions and be installed at key points and intersections at a scale that is appropriate to either pedestrians or motorists. Signage should link routes to destinations and points of interest whether these routes are pedestrian, bicycle, or automobile oriented.

Costs for signage depend on materials and design, but typical costs (including installation) can fall in the following ranges. As an example, a signage and wayfinding program in Clarksville, Iowa is estimated to cost $20,000 for directional signage and three interpretive panels.

- Historic street signs: $300 - $1000
- Panel signs: $800 - $1200
- Kiosks: $5000 - $10,000
- Monuments and community gateway signs: $10,000 and higher

6. Lighting

Light poles and fixtures can be the most visible features in a streetscape and can create a distinct and historic character for downtown districts. Lighting choices, including those for overhead street lights, pedestrian scale lights, and lighted bollards, should reinforce the district's historic qualities through consistent design and ornamentation. Lighting can be personalized for communities through the inclusion of arms and brackets for mounting custom banners and flags or for hanging planter baskets, as well as the inclusion of community logos or emblems. Designs should be coordinated with local utility providers, which are typically partners for street lighting and other utility projects.



Communities should also consider high-efficiency fixtures and solar panel strategies to reduce energy consumption, and Dark Sky compliant luminaries that help preserve the aesthetic qualities of the night sky and reduce the wasteful lighting of areas above the lighting fixtures. LED lighting fixtures offer the greatest potential advantages including lower energy usage, better light quality and color rendition, and longer-lasting fixtures. Communities should make sure that streets and sidewalks are consistently well-lit without being too bright or too dark in spots.

As with the other practices, costs for lighting are highly variable, but may be subsidized by local utility companies. The costs below include installation.

- Historic street light (20-35'): $5000 - $10,000
- Historic pedestrian light (12-15'): $1500 - $5000
- Lighted bollard (4'): $1500 - $3000





7. Public Art

Public art that draws upon the primary cultural, historic, and natural themes of the area will help to create unique communities. Sculptures, wall murals, fountains, decorative walls, and custom designed furnishings can enhance the streetscape, create a local and distinct historic district character, and educate visitors about historic and cultural elements of the community. There are many opportunities to add public art into the downtown streetscape, including materials and elements within the streetscape itself, and murals or other displays on blank walls and sides of buildings.

Efforts should be made to integrate the style and people involved with local arts and crafts into the design and fabrication of public art and other furnishings. The identification of local artists and craftspeople can lead to the integration of these skills and qualities into a public space in a way that makes it more beautiful and unique, and also supports local businesses and industry. Costs for public art vary widely from reasonably inexpensive (wall murals for $5000) to more expensive (sculptures and fountains for hundreds of thousands of dollars) depending on the artist and the medium.

8. Parks, Plazas and Open Space

Many historic commercial districts include central parks, plazas, squares, and pocket parks that are key focal points within a community system of parks, trails, and open space. In fact, communities benefit economically when residents and visitors can be drawn in to visit the shops and eateries of the commercial district from the park and trail system. Nearby parks and open space can be improved through the use of the other green infrastructure strategies discussed in this guide.

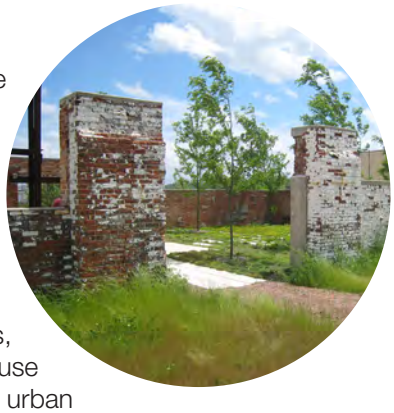
Costs for parks, plazas and open space depend on the cost of land, as well as the improvements and programming planned for the space. Conversion of a vacant downtown lot into a pocket park in Clarksville, Iowa has a projected cost of $40,000, while a similar project in Rockford, Iowa, which includes the creation of a small earthen amphitheater, is estimated to cost $108,000. Improvements to a large, existing riverfront park in Rockford are projected to be approximately $350,000 for paths, an ice skating pond, shelters and other amenities, a disc golf course, and landscaping.

Case Study: Charles City Permeable Streetscape

The historic residential district of Charles City, Iowa was suffering from crumbling streets, failing stormwater catch basins, and nuisance flooding of streets following moderate rainstorms. Charles City sought a new approach to address the streets and stormwater issues, and worked with a consultant team led by Conservation Design Forum to evaluate and compare the cost and performance of a conventional versus a green infrastructure solution. As a result, the City chose to pursue a Permeable Streets plan for a 17 block residential area of the City. Plan alternatives included permeable paving, parkway bioretention, and curb bump outs at street intersections designed to infiltrate rain water. The final design of the system captures runoff from streets, yards, and alleys and provides complete infiltration for the 2-year storm event. Rain water that can not be infiltrated by the system, which should only occur for extreme events, overflows into the existing storm sewer system. Since the storm sewers are much less frequently used, maintenance and replacement costs are much lower as well. This $3.5 million project was funded in large part by state and federal financial assistance.

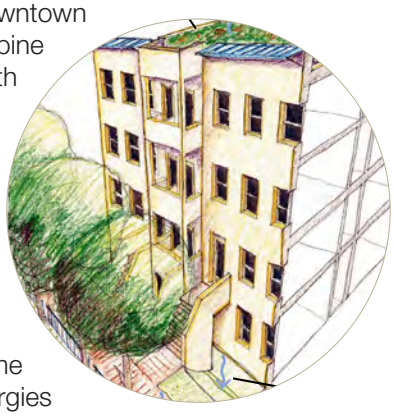
9. Redevelopment of Underutilized or Vacant Parcels

It is inevitable that commercial historic districts will experience vacant buildings and lots, particularly in difficult economic times. In some communities, new commercial districts on the edges of town are out-competing locally-owned businesses within the district. Vacancy and lack of maintenance of these properties can create the perception of an uncaring attitude and lack of investment, which can lead to still greater disinvestment in commercial districts. It is important to prioritize reinvestment, rehabilitation and reuse of these buildings and parcels, either as new business ventures or other productive uses such as pocket parks, museums, community centers, or galleries. Removing a blighted or otherwise unloved piece of downtown often results in a net economic benefit to the community.



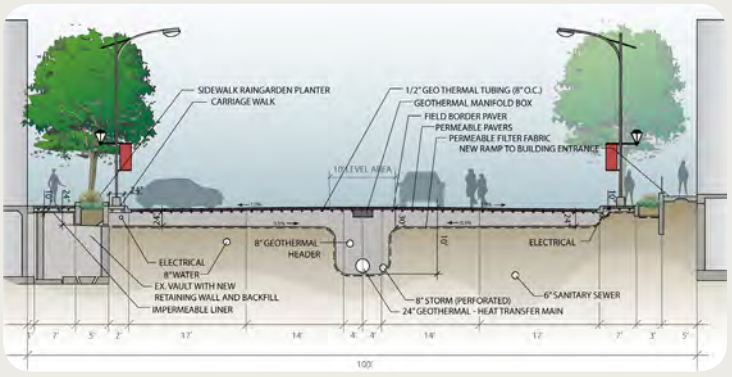
New structures should be planned and designed in a way that compliments the urban context and human scale of the district. Narrow setbacks, off-street parking located to the side or rear of buildings, and multiple-story, mixed-use buildings are some of the urban design strategies critical to maintain the integrity and functionality of the district.

10. Upper-Story Residential/Office



Most successful downtown commercial districts combine first floor retail offerings with other uses in upper floors, typically offices and residences, depending on demand for real estate and the structure of the buildings. This mix of uses can create more downtown destinations, daytime and nighttime activity, and greater synergies between the needs of businesses and residents. It is this proper balance of destinations, activity, and supply and demand that can help to create and maintain a healthy and active downtown business district. Second and third story floors may be able to be added to existing single story commercial buildings, however, it is more common for existing underutilized upper story space to be restored and rehabilitated for new uses. Combining sustainable strategies with new upper story uses adds even more value and benefits for the district. For example, green roofs can help reduce energy use while district geothermal systems can provide a lower cost source of renewable energy for heating and cooling.

Case Study: West Union Downtown Streetscape



The Iowa Economic Development Authority (IEDA) selected West Union, Iowa as a designated IEDA Green Pilot Community to serve as a catalyst for further investment in the historic downtown and showcase the integration of multiple sustainable practices in a downtown setting. A Streetscape Master Plan and design was completed through an open and inclusive community participation process in cooperation with the local Main Street program. The project includes the complete renovation of six downtown blocks and will replace aging water, storm water, and sanitary sewer infrastructure. West Union can showcase innovative sustainable design strategies as a model for other communities, including permeable pavement, pedestrian crosswalk practices, bioinfiltration rain gardens, energy efficient lighting, and a district-wide geothermal heating and cooling system. Total project cost is approximately $10 million, 78% of which is funded by state and federal grants.

V. Project Planning Process

Once the decision has been made to initiate a project, the planning process typically involves a number of steps including site assessment, programming, conceptual design, budgeting, detailed design and engineering, bidding, construction, and post-construction management and maintenance. In order to achieve the highest level of quality, performance, and value, the planning process should also include the following elements.

1. Committed Leadership. Local leaders, business owners, community volunteers, and paid staff should understand and embrace the value and benefit of integrated, green design and commit the resources needed to achieve them.
2. Collaborative Team of Professionals. The best outcome and greatest value results from the involvement of a variety of experts and perspectives, often including architects, landscape architects, engineers, transportation planners, horticulturists, ecologists, energy specialists, and others.
3. Open, Interactive Design Process. In order for a project to be well-received and cared for over time, it must meet the needs of the people it will serve. Inclusion of these stakeholders is essential from the early states of the design process.
4. Design Responsive to Local Conditions. A thorough analysis and assessment of existing conditions and contexts, including natural, cultural and historic resources, is essential to creating a responsive, effective design.
5. Alignment with other Requirements. A number of local and state agencies have established protocols for project development, including the Iowa Department of Transportation, Department of Natural Resources, and Department of Economic Development.

VI. Implementation

One of the essential components to implementing green infrastructure and other improvements within historic commercial districts is the dedication and determination of a motivated Main Street organization including residents, business owners, not-for-profit organizations, and others. This group is the best vehicle to envision, evolve, and implement specific plans and practices necessary to improve the downtown district. In order to realize the benefits of the approach and practices described in this brochure, a series of next steps will be necessary.

1. Develop a cohesive and comprehensive community plan that includes downtown improvements. The plan should be developed through an open, inclusive, and public participatory process including key property owners and stakeholders. The plan will serve as a tool to help communicate the community vision to many audiences.
2. Develop community development guidelines that support the overall community vision and that establish expectations for all properties within the downtown district.
3. Integrate green practices into current or planned projects within the public right-of-way as infrastructure is updated and improved.
4. Establish the regulatory framework and standards for incorporating sustainable practices into design, development, and construction projects.
5. Encourage sustainable practices to be incorporated into new development designs.
6. Seek financial and technical support to help implement projects.
7. Establish a regular, open, and ongoing community dialogue about the vision, plan, and projects.
8. Schedule activities and information sessions in tandem with community events.





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