SEAC
SUSTAINABLE EVANSVILLE AREA COALITION
Henderson • Vanderburgh • Warrick

the Millennial Plan for 2040

Volume 2

A Regional Plan for Sustainable Development for Henderson, Vanderburgh, and Warrick Counties

April 2014

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EVANSVILLE MPO

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RESOLUTION

A RESOLUTION OF THE EVANSVILLE METROPOLITAN PLANNING ORGANIZATION ADOPTING THE *MILLENNIAL PLAN FOR 2040: A Regional Plan for Sustainable Development for Henderson, Vanderburgh, and Warrick Counties*

WHEREAS, the Evansville Metropolitan Planning Organization (EMPO) is the organization designated by the Governor as the Metropolitan Planning Organization responsible, together with the State, for carrying out the provisions of 23 U.S.C. 134 (Federal-Aid Highway planning requirements), and capable of meeting the requirements of 49 U.S.C. 1603(a) (Federal Transit planning requirements) in the Evansville-Henderson Urbanized Area; and

WHEREAS, the Evansville Metropolitan Planning Organization has established a region-wide, cooperative, comprehensive, and continuing planning process to develop the unified planning work program, long range transportation plan, and transportation improvement program. The Evansville Metropolitan Planning Organization enacts the plans and programs to facilitate federal, state, and local funding for surface transportation improvements carried out by the Indiana Department of Transportation, the Kentucky Transportation Cabinet, the region's communities and counties, and transit operators, and provides technical assistance and expertise to regional transportation interests; and

WHEREAS, the Evansville Metropolitan Planning Organization conducted the planning process for the *Millennial Plan for 2040* in an open, participatory manner, as required by the 2010 Regional Sustainable Communities Grant Program funded by the Office of Sustainable Housing and Communities (OSHC) of the U.S. HUD;

WHEREAS, the *Millennial Plan for 2040* includes goals, objectives and recommendations to achieve the regional vision related to Transportation and Infrastructure Development, Housing and Neighborhood Development, Workforce and Economic Development, Environment and Healthy Communities, Arts and Cultural Development, and Building and Land Development;

WHEREAS, the Evansville Metropolitan Planning Organization has complied with HUD OSHC Terms and Conditions for FY 2010 NOFA;

WHEREAS, the consultant for the Evansville Metropolitan Planning Organization presented the draft *Millennial Plan for 2040* to the Sustainable Evansville Area Coalition (SEAC), at the SEAC Steering and Technical committees, the Evansville MPO Technical and Policy Committees public meetings, and made the draft Plan open to public review and comment online at www.SEACplan.org; and

NOW, THEREFORE, BE IT RESOLVED that the Evansville Metropolitan Planning Organization Policy Committee at the regular meeting of April 3rd, 2014 adopts the *Millennial Plan 2040.*

Duly adopted by the Evansville Metropolitan Planning Organization Policy Committee on this third day of April, 2014.

Jack Corn, Chairman

ATTEST:

Seyed Shokouhzadeh, Executive Director

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- **Dawn Hoesli** – Graphic Layout
- **Michael Howery** – Graphic Illustration

We thank all of the Consortium Member Organizations and those who attended stakeholder meetings for providing reliable input and ideas. It is to the People of the three-county Region, that this Plan is dedicated, in order that they find optimism and prosperity in the coming decades. Any errors, oversights, or inaccuracies are the responsibility of Bernardin Lochmueller & Associates.

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Chapter 1: Summary, Vision, & Goals

"Make no little plans; they have no magic to stir men's blood and probably will themselves not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will not die."

- Daniel Burnham

With the information collected through the visioning workshops as well as the surveys, a draft vision statement was prepared that encapsulates the future of the Evansville region. In developing this vision statement, the consortium members were contacted to obtain vision statements from their organizations. Following review of vision statements from consortium members, a draft statement was prepared and submitted to the EMPO. The statement was presented to all technical committees.

The Vision Statement is:

"Great Life, Great Community, Great Environment, Great People"

Development of the goals and vision for this plan also originated with information from the visioning workshops and the surveys. Draft goals were identified in each of the areas of transportation, housing, economic development, environment, arts and culture, and land use. After review by the EMPO, the draft goals were presented to the technical committees in January of 2012. As the process has proceeded, pertinent goals and vision declarations have been added in cooperation with community stakeholders.

Executive Summary

The **Millennial Plan for 2040: A Regional Plan for Sustainable Development** is not meant for the faint hearted or for those who are only interested in maintaining the status quo. Due to changes in the economic climate in America, along with rapid advances in digital technology, it is incumbent on local communities to take stock of their strengths and weaknesses and embark on a visioning and planning journey that can lead to more and better choices for their citizenry. The need to upgrade and improve housing and infrastructure to serve all income levels has never been greater than it is today. And this need will only grow as urban housing and utility infrastructure continue to age.

Research of national trends on housing supply and demand indicates the demand for attached, multi-family housing units, as well as for smaller lot single-family housing currently exceeds supply by nearly 10%. [1] This can be attributed in part to housing preferences of Millennials, as well as Baby Boomers looking at more appropriate housing options to age-in-place.

In Table 1-1, examining the Evansville metro region population and developed land area data, an alarming trend has emerged whereby population density on a square mile basis has decreased from 3,800 persons per square mile in 1990 to 1,800 persons per square mile in 2010. Projecting this growth trend into the future has devastating consequences on land consumption in the region. And, much of the land consumed is currently farmland which is a major economic driver in southwest Indiana. [2]

1 New Urban News, from Housing preference data of Arthur C Nelson (2006), Robert Charles Lesser & Co. (2008), and National Association of Realtors (2011); and Housing supply data of American Housing Survey (2009)
2 National Land Cover Database & U.S. Census Bureau

This rate of land consumption alone would suggest the need to undertake a development strategy that emphasizes infill investment to reduce urban sprawl. Land consumption has not traditionally been identified as a major concern throughout the Midwest because population growth has tended to be steady but minimal. However, when looking well into the future, even steady growth demonstrates that land consumption could be a Midwest problem too.

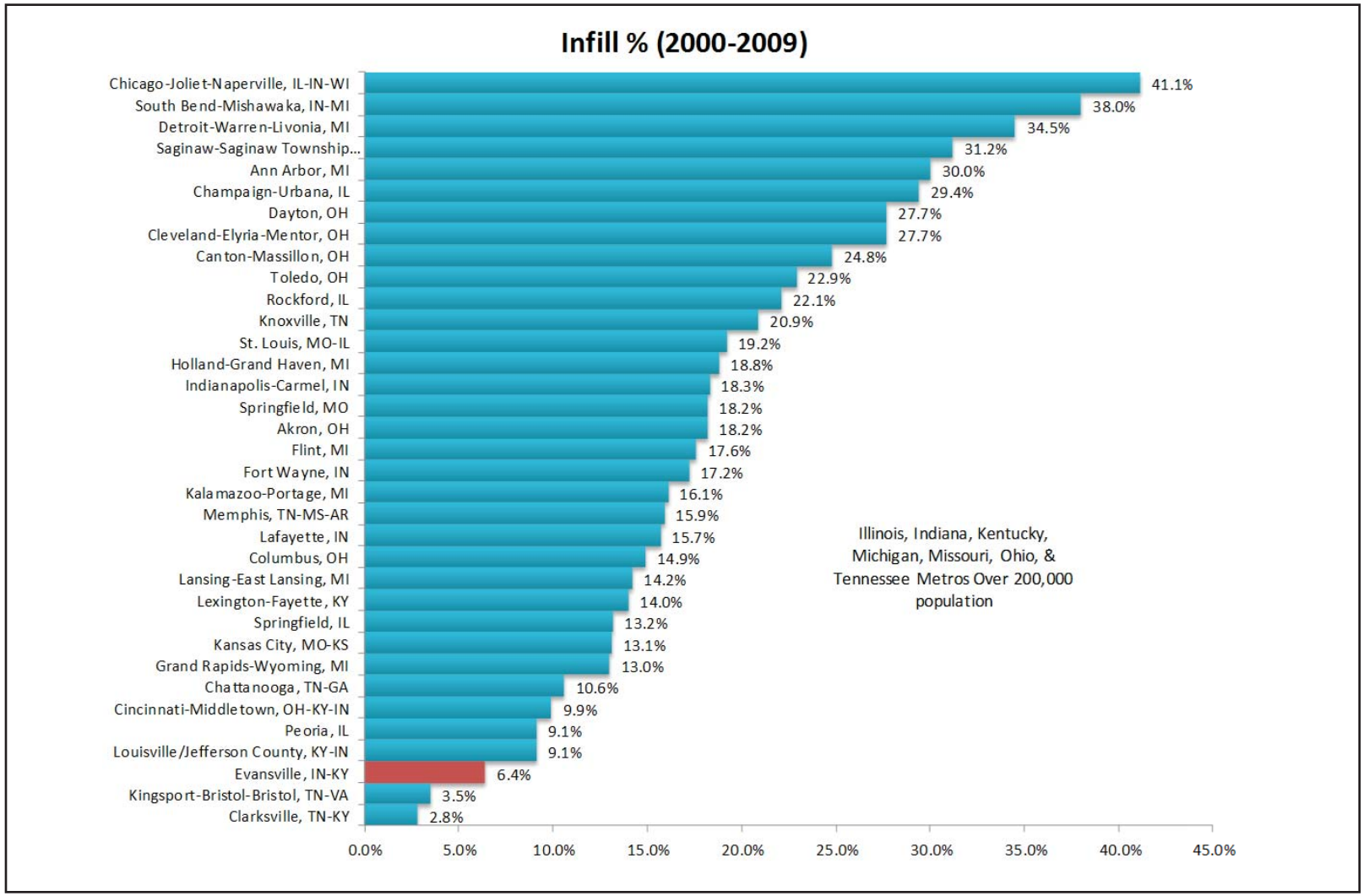
Table 1-1: Regional Population Density

	Population	Developed Land Area	Density
1990	253,082	70 miles^2	3,800
2000	269,134	110 miles^2	2,400
2010	285,652	160 miles^2	1,800
2050?	360,000	336 miles^2	1,000

As evidenced in Figure 1-1, many Midwest metropolitan regions of similar or larger size to the Evansville region have made a concerted effort to commit resources and energy into developing an infill growth and development strategy. U.S. Census Data from 2000 to 2009 tracking infill development shows that the Evansville region has fallen well behind even some of its Indiana counterparts in infill development.

It is time to commit to a long-term growth and development strategy that acknowledges the region simply cannot afford to continue with business as usual. A strategy that lays the groundwork for necessary policy changes, promotes wise investment of limited public dollars, capitalizes on the many existing assets in the region, and enhances the overall quality of life for the people of this region, while attracting additional population growth is required. Implementing this type of strategy now is the key to ensuring the Evansville metro area will become a more vibrant and prosperous region for years to come.

Figure 1-1: Percent of Infill Development



Executive Summary

The Millennial Plan for 2040 will serve as the primary policy and planning document for the three-county region of Vanderburgh, Warrick and Henderson counties. The Plan is being funded by the federal Housing and Urban Development administration; the federal Department of Transportation; and the federal Environmental Protection Agency. As financing for future development shifts from federal and state coffers to local private sources and local taxpayers, a Regional Plan can be used as a tool to optimize finances and resources to the best advantage of the Metro Region.

The key findings and recommendations of the RPSD are summarized as follows:

- **Vision for 2040:** The tri-county area needs to cooperate in a regional effort to establish a vision of its future. The Vision for 2040 must be a blueprint for attracting and keeping young adults in the Millennial generation by offering a wide range of job opportunities, a variety of arts and cultural venues and activities, and neighborhoods with family amenities that can be accessed by walking, biking and autos.

- **Travel Modes:** Costs for transporting people and goods will continue to rise as fossil fuels become scarcer and new modes of transportation are developed. Therefore, it makes sense to plan and develop all viable modes of travel, while improving fuel efficiency of predominant existing modes of freight hauling and travel. Vehicle miles traveled (VMT) by automobiles in the United States has leveled off after decades of increase. Developing streets and highways for all modes of transport including walking, bus rapid transit, and bicycling provides paybacks in health, wealth, safety and livability.

- **Resource Protection:** Respect for both private property and the "public good" must be in balance in a resource-savvy community. Protection of prime agricultural land, restoration and sensible re-use of previously strip-mined lands, and sensitive oversight of managed land in state and federal preserves will assure that descendants in future generations will be able to enjoy the bounty of the earth as past generations have done.

- **Housing Options:** Opportunity and choice are the mainstays of a free nation. The highest calling for local communities in the region is to provide economic opportunity, good-paying jobs, safe and functioning infrastructure, food security, and choices in selection of housing type and housing cost. The Growth and Revitalization Plan and the Workforce and Senior Housing Plan of the RPSD seek to outline methodologies for private development and public programming that provide a robust range of housing options that are near employment centers.

- **Compact Development:** Being resource efficient through 2040 means making wise decisions concerning the use of real estate and raw land. Compact development efficiently optimizes infrastructure extensions while saving rural agricultural resources. When land development is provided at densities between eight and sixteen dwelling units per acre (net, not counting streets), bus rapid transit becomes possible.

- **Livable Neighborhoods:** Preserving historic neighborhoods while fostering conditions that are conducive to the development of new residential neighborhoods having highly “livable” centers made up of mixed uses, mixed incomes, and diverse activities, strengthens the fabric of the region, keeps young people from moving away, and attracts new residents from outside the area. Urban neighborhoods in the City of Evansville and the City of Henderson contain a high percentage of vacant or deteriorating housing that will need serious attention in the coming decades.

- **Arts and Culture:** A vibrant and robust region provides a unique culture where arts, education, sports, entertainment, worship, and group activities flourish. In diversified local economies that can adapt to change, where jobs are plentiful, opportunities are abundant, and wide ranges of choice prevail, the population is well-served and heavily involved in creating their personal and joint destinies.

- **Revisions of Zoning Ordinances:** Stakeholders in all three counties have referred to the present zoning ordinances in their jurisdictions as major stumbling blocks to providing creative, quality compact development. Revisions to zoning ordinances in Warrick, Henderson, and Vanderburgh will be required in order to implement the housing and land use changes outlined in this document. Land use regulations should be structured to give developers the impetus, inspiration, and incentives to build creative quality projects.

As the region moves toward 2040, game-changing forces are at work presenting both peril and opportunity. The three county area – Vanderburgh, Warrick and Henderson – must move with unified resolve and intention to undertake the following Economic Development Initiatives:

- **US 41 Multi-Modal Corridor:** Redesigning and greening the US 41 corridor as a complete transportation artery including facilities for transit, bicycles, and pedestrians.

- **Epworth Road Health Care Park:** Facilitating and expanding the growing healthcare facilities along Epworth Road in Warrick County into a Regional Healthcare Park.

- **Research and Development Park Along University Parkway:** In conjunction with USI, GAGE and the Southwestern Indiana Chamber of Commerce, developing a Friendly "Founder Town" Research Park on Evansville's west side.

- **Henderson Convention and Entertainment Zone:** Surrounding the site of the old coal-fired power plant in downtown Henderson, developing a Convention and Entertainment Zone, in conjunction with the River City Renaissance team and the Henderson County Chamber of Commerce.

- **Downtown Evansville Riverfront Conversion:** Developing a slack water harbor, and at the site of the sand and gravel yard, developing a new mixed use district with boardwalks, restaurants and housing.

- **Regional Food Hubs:** Partnering with Welborn Foundation in creating centralized locations for local food marketing, sales and management in Henderson's East End, along Highway 41 North, and in downtown Evansville.

- **Industrial Legacy Districts:** Rediscovering urban areas in Evansville and Henderson that, in their heyday, housed viable manufacturing companies, foundries, tool and die shops, assembly plants, and a variety of other industrial concerns.

- **Village Earth:** Envisioning and developing a sustainable new community that houses a Midwest Acquarium, Natural History Interpretive Center, and Center for Sustainable Living.

Vision Themes

The following Vision Themes were developed by Consortium and Technical Committee members.

Vision Theme Number One:
Great Life

In concert with the Livability Principals, presented in the Volume 1 Introduction, the Great Life Theme consists of balanced, compact growth within livable urban, suburban and rural neighborhood centers. At the heart of these centers will be vibrant mixed use developments that serve the neighborhood. These centers are brimming with street life and commerce, dining and relaxing, and just plain hanging out. The characteristics of the neighborhood centers are as follows:

- Compact mixing of land uses
- Diversity in housing types and affordability near job centers and transit stops
- Remediation of abandoned and underutilized lands, including brownfields, greyfields, and redfields (foreclosed properties)
- Provision of ample opportunities for recreation and open space enjoyment
- Promotion of historic preservation and development of cultural resources.

Vision Theme Number Two:
Great Community

The Great Community Theme means making the most of existing cities, towns, and villages. It consists of downtown redevelopment, urban area revitalization, infill development, and urban core infrastructure upgrading. Included within the Theme are the following characteristics:

- Promotion and redevelopment of downtown shopping and governmental centers as livable, mixed-use downtowns
- Encouragement of loft housing, adaptive reuses, infill construction and remediation of underutilized properties, particularly brownfield sites
- Development and renovation of housing resources to offer good quality, affordable housing choices in all neighborhoods and urban centers
- Continued development and interconnection of greenway and bikeway systems in the three county region
- Partnering to protect threatened natural species, either plant or animal
- Promotion of high quality design and planning to achieve an aesthetic quality in neighborhoods and downtown urban areas.

Vision Theme Number Three:
Great Environment

The Great Environment Theme centers on valuing the Green Infrastructure and world of nature. It entails preserving prime agricultural and open spaces, while promoting orderly, balanced, compact development. The following elements are the keys to this Theme:

- Promotion of regional greenway systems and blueways (water trails such as Pigeon Creek) and fostering of linkages of greenways and blueways across county lines
- Optimizing existing road and sidewalk networks, and drainage infrastructure, before extending new subsystems
- Encouraging redevelopment of underutilized sites and vacant infill areas within established neighborhoods and downtown urban centers
- Promotion of compact development through revisions in zoning and subdivision ordinances
- Fostering of local food networks, farmers' markets and urban gardening, all integrated into the regional food economy
- Preserving historic rural farms, prime agricultural lands and rural vistas and landscapes.

Vision Theme Number Four:
Great People

The Great People Theme values rich diversity and the unequaled talents of the population in Vanderburgh, Warrick and Henderson Counties. Integral to this Theme is human and workforce development, along with cultural education. The following items are crucial to human development efforts:

- Supporting schools, public and private, at each age level from pre-kindergarten through graduate school
- Enhancing the technical expertise of the workforce through training and human development efforts, seminars, convocations, lectures and festivals
- Encouraging all of the players and actors in a rich cultural resource milieu, from fine to performing arts, and from concerts to gallery showings
- Developing sports and athletics venues for optimal performance and spectator enjoyment
- Continuing specialty education offerings, as evidenced by the Signature School, the Career and Technical Center, the growing Ivy Tech presence in Southwest Indiana, the Fine Arts Center at Henderson Community College, and the religious education resources throughout all three counties.

Goals

The following goals were developed during the SWOT analysis exercises in public meetings held in the three counties: Vanderburgh, Warrick, and Henderson. They are organized under the functional areas of the SEAC Regional Plan for Sustainable Development.

Transportation and Infrastructure Development Goals

1. Supply a regional transportation system that encompasses all modes and is user-friendly.
2. Improve accessibility options for all residents.
3. Encourage all new developments to be walkable.
4. Improve the movement and connectivity of freight via rail, road, air and water throughout the region.
5. Coordinate regional subsystems including drainage, wastewater, electrical distribution and wireless broadband access with the transportation network in optimal locations in order to encourage wise and economical growth patterns.
6. Promote "complete streets" in all neighborhoods and districts, thereby creating safe, convenient access and travel for pedestrians, bicyclists and motorists.

Housing and Neighborhood Development Goals

1. Create distinctive, livable areas, supported by appropriate public policies and ordinances.
2. Expand housing choices for all income levels and life stages with emphasis on affordable workforce housing near job opportunities.
3. Reduce total housing and transportation costs.
4. Encourage redevelopment of vacant city properties for housing.
5. Empower residents, renters and homeowners alike, to work together to improve the appearance and function of their neighborhoods.
6. Encourage "Life Cycle Housing" strategies that offer a variety of housing types such as townhomes, zero-lot villas, and clustered multi-family rental units.
7. Provide "shovel-ready" blocks and sites for private development.

Workforce and Economic Development Goals

1. Make the region more attractive to emerging industries and employees.
2. Support local small businesses and incentivize their expansion.
3. Embrace all entrepreneurship with both public and private incentives.
4. Encourage redevelopment of greyfields and foreclosed properties.
5. Educate, attract, and retain a skilled workforce.
6. Attract clean, green, high-tech enterprises to the metropolitan area.

Environment and Healthy Communities Goals

1. Maintain an environment that encourages healthy lifestyles and continually improves air and water quality for all residents.
2. Encourage mitigation and redevelopment of brownfields and greyfields.
3. Preserve high quality farmland and open, green spaces, while planting street trees along local streets.
4. Institute watershed management practices and maintain soil erosion control standards.
5. Encourage green building and equipment technologies.
6. Institute afforestation and reforestation programs in appropriate locations in the three county area.
7. Promote public safety, healthy eating habits and walkable neighborhoods that encourage residents to be outside, breathing fresh air and exercising daily.

Arts and Cultural Development Goals

1. Encourage affordable tourism opportunities for local residents and regional visitors.
2. Increase the use of locally grown food products and arts and crafts.
3. Provide wide access to recreational and cultural opportunities.
4. Improve the use of the Ohio River, Pigeon Creek, Green River, and other waterways for recreation and commerce.
5. Provide walkable and accessible neighborhood centers for gathering and community festivals and events.
6. Nurture and improve schools, universities, and other instructional and educational venues in the region.
7. Promote a wide range of entertainment options and opportunities at all pertinent and appropriate venues.

Building and Land Development Goals

1. Incentivize builders and developers to provide higher density residential and commercial land uses along transportation corridors in compact neighborhoods having modern public services and accessible consumer provisions.
2. Explore land trusts in order to preserve forests and prime agricultural land.
3. Promote, through land use regulations, including subdivision and zoning ordinances, infill development on vacant land that is already served by streets and infrastructure to optimize taxpayer cost for public improvements and maintenance.
4. Encourage multi-use buildings for mixed income groups with a mixture of development densities, in order to foster diversity and "sense of place."
5. Discourage development in sensitive areas such as wetlands, steeply sloping sites, native woodlands, wildlife habitats, and coal-mined lands.
6. Encourage and incentivize development that minimizes waste, pollution, and the production of CO2, in order to help minimize the negative effects of climate change.
7. Promote, through building codes and ordinances, and the LEED sustainable building rating system, the use of sustainable building techniques and green building materials for all new public buildings.

Regional Plan Objectives

Objectives:

Transportation and Infrastructure - ("Connectivity")

1. Reduce total vehicle miles traveled (VMT) by promulgating compact, mixed use "floating zones" with specific development standards applied to each zone.
2. Provide alternatives to the "single-driver" auto mode, including walking, bicycling, carpooling, car-sharing and bus transit by fostering complete streets, road diets, dedicated bus rapid transit lanes, connected pedestrian trails and bikeway corridors.
3. In all publicly-funded agencies and organizations, institute the use of vehicles powered by renewable fuel sources such as biodiesel, solar electric, hydrogen, compressed air, or natural gas produced from methane waste products.
4. Encourage neighborhood street design that will discourage higher traffic speeds while encouraging safer walking and bicycling.
5. Implement street designs that enhance access and connectivity to and between neighborhoods, including commercial and mixed land uses in between residential neighborhoods.
6. Promote green streets with ample native vegetation and indigenous trees in rights of way and boulevards, forming canopies and linear allees.
7. Promote neighborhood street grids and smaller block developments by granting developers a range of incentives for compact, dense residential development.
8. Institute natural sewage and septic treatment systems through bioswales, rain gardens and riparian buffers, all capable of discharging effluent that meets or exceeds federal drinking water standards, while eliminating the use of harsh chemicals.
9. Help institute more genuine composting and gray water reuse activity and practices by removing outdated regulatory or health department standards that would otherwise prohibit these systems from consideration.
10. Promote natural wastewater planning and practice on-site, at the neighborhood and community level, working to reduce the overuse of heavily engineered, expensive municipal collection and processing systems.
11. Implement multi-modal arterials and collector streets to form boundaries and edges around strongly-defined neighborhoods.
12. Implement a Regional Transit Authority and a Bus Rapid Transit (BRT) system to serve the three-county area.

Objectives:

Housing and Neighborhoods – ("Location Choices")

1. Encourage compact, dense housing development near employment centers in the range of 8 – 16 dwelling units per acre.
2. In all new residential communities, provide at least five percent of the new housing units as affordable workforce units for low-income residents.
3. Incentivize developers to provide, in every new neighborhood and residential development, housing products that draw a diversity of homebuyers in terms of income, age, social, and cultural characteristics.
4. Promulgate landscape design practices that provide natural species and indigenous plant materials that are hearty enough to thrive without pesticides and herbicides.
5. In zoning ordinance, PUD ordinance, and subdivision regulation revisions, provide for compact and clustered residential development areas with reduced, minimum lot sizes and setback line dimensions.
6. Encourage proper marsh and wetland designs that can accomplish natural filtration and restoration of the quality of the on-site surface water runoff before it leaves the immediate area where it was generated and enters local estuaries.
7. Reduce or eliminate impervious paving materials in favor of permeable options such as patio pavers, pervious asphalt and concrete drives, and masonry block pavers that allow grass to grow up through perforations.
8. Make neighborhood street lanes no wider than eleven feet and encourage parking at the rear of residential lots, rather than on-street, by implementing neighborhood alleyway systems.
9. Discourage "snout" garages – garages that project into the front yard further than the houses they are attached to.
10. Give incentives for developers to provide boulevards, dedicated bike lanes, extensive green landscapes, and other neighborhood amenities that will help foster a cleaner, safer and more aesthetic environment.
11. Identify neighborhood centers in each viable neighborhood; such as schools, libraries, parks, or community centers; where residents can identify and socialize with one another.
12. Provide incentives to local builders and developers in order for them to include affordable workforce housing in all multifamily projects.

Regional Plan Objectives

Objectives:

Economic Development – ("Skilled Workforce")

1. Reduce, through efficiencies and connections in the street and road network, employee and product transport vehicular trips and total vehicle miles traveled (VMT).
2. Promote the use of regenerative and renewable energy alternatives to fossil fuels in processing and transport systems.
3. Reduce and ultimately eliminate the use of any traces of cadmium, lead, mercury, and any other potentially toxic metals, minerals, or manufactured substances that can build up in the biosphere over time.
4. Incentivize and promote locally-based and home-based businesses, thereby reducing total commuting mileage.
5. Develop a Air Quality Task Force to continue to monitor and improve air quality in the Southwestern Indiana, Western Kentucky, and Southeastern Illinois area.
6. Reduce and minimize the use of synthetic chemicals that may cause potential harm to environmental ecosystems, while employing proper disposal mechanisms where their use is unavoidable.
7. Employ agriculture processes that reduce or minimize the use of pesticides, herbicides, and manufactured synthetic, unnatural fertilizers.
8. Minimize the consumption or destruction of virgin raw materials by utilizing recycled or by-product materials wherever and whenever possible.
9. Maintain natural terrain, drainage and vegetation biosystems, while minimizing disruption to interdependent, natural ecosystems.
10. Use agricultural approaches that stockpile rather than deplete topsoil, and conserve the use of groundwater sources that would otherwise deplete underground aquifers.
11. Encourage local, community-supported agriculture and provide near-to-home sources for fresh, healthy food, by mitigating urban "food deserts."
12. Encourage new major commercial or industrial developments to include wellness trails for employees.

Objectives:

Environment and Healthy Communities – ("Walkable Neighborhoods")

1. Provide recreational facilities within a 10 minute walk and a 5 minute bicycle trip for residents of all neighborhoods.
2. When maintaining parks and open spaces, minimize use of equipment powered by fossil fuels such as mowers, edgers, and leaf blowers.
3. In order to preserve natural outdoor spaces and wildlife reserves, maintain a reasonable public fund for open space acquisition and land banking.
4. Preserve pristine wilderness places, without encroachment of vehicles and powered equipment, such as bulldozers and chain saws.
5. Promote urban and community gardens as a strategy for food security and fresh produce for area residents.
6. Preserve wildlife habitats and safeguard the biological diversity of all regional ecosystems.
7. Encourage utilization of on-site composting of organic waste at both residential and commercial establishments.
8. Restore damaged natural systems through regenerative design and restorative strategies.
9. Create a system of interconnected greenways and greenspaces that feature hiking trailheads, and historic and educational markers.
10. Develop responsible alternatives to landfills and general solid waste disposal, such as methane capture, composting, recycling, and minimizing plastic and paper packaging in favor of biodegradable waste that can mix naturally and enrich the earth.
11. Use regionally native plants for lush landscaping and natural appurtenances such as green walls and roofs to adorn public buildings.
12. Maintain and expand public parks and open spaces so all residents are within a 5-10 minute walk of green space.

Objectives:

Arts and Culture – ("Family-Friendly")

1. Continue to develop entertainment and family recreational opportunities that are connected with nature and the outdoors.
2. Foster collaboration between local higher education institutions and area not-for-profits to offer innovative family education opportunities that have potential to forward community goals for a cleaner, healthier region.
3. Continue to fund worthwhile established venues such as the Evansville Zoo and Botanical Garden and the John J. Audubon Park with tax dollars so that maintenance, upkeep, and continued transformational growth are assured.
4. Develop a new amphitheater on the Evansville Dress Plaza Riverfront, at the south end where the rip-rap rock bank is presently located.
5. Encourage more public art by endowing the Public Art Commission in Evansville with a public-private budget to commission public art pieces, and in Henderson through a Cultural Arts Commission.
6. Encourage public art and murals in urban gateway locations such as the new Fulton Avenue underpass of the Lloyd Expressway and in the future, in conjunction with the newly reconstructed interchange of Highway 41 and the Lloyd Expressway.
7. Institute a "Cultural Heritage" program, alternating between downtown Henderson, downtown Evansville, downtown Boonville, and downtown Newburgh, showcasing a wide variety of ethnic/ cultural heritage displays and presentations, complete with food and entertainment, over one weekend each month during the summer months of the year (June through September).
8. Construct a new eight-field softball complex southwest of the Goebel Soccer Fields on Evansville's east side. (By the Evansville Convention and Visitors Bureau.)
9. Redevelop greyfield sites such as Washington Square and the Westside WalMart in Evansville with mixed use shopping and entertainment centers near multifamily housing.
10. Organize and implement regional Food Hubs for local food production, mobilization, marketing and delivery in the Henderson East End and in northern Vanderburgh County.
11. Optimize and enhance riverfronts of all communities contiguous to the Ohio River, including Evansville, Henderson, and Newburgh.
12. Identify several locations along the present bicycle trails systems, in each county, to install unmanned bicycle rental venues where bicycles can be rented by the hour and returned at other rental locations.

Objectives:

Land Use and Building Construction – ("Compact Development")

1. Encourage new developments and existing neighborhoods to provide a mix of community uses such as housing, shops, workplaces, schools, parks, and civic facilities – all within walking and biking distance of every resident.
2. Encourage and prioritize development that is proximate and oriented toward major transportation routes and bus lines.
3. Direct new development toward previously existing developed areas, minimizing development in outlying, under-served and undeveloped areas.
4. Publicly remediate brownfield and greyfield sites that may have environmental constraints that private entities find too risky for restoration efforts.
5. Encourage and reward regional and local designs that respect regional ecosystems and natural functions while supporting human settlement.
6. Create financial and regulatory incentives that encourage infill development while eliminating any associated disincentives.
7. Guide development away from floodplains and restore wetlands and riparian strips along rivers.
8. Mount afforestation and reforestation programs to plant trees and other vegetation in quantities that absorb significant amounts of carbon dioxide and air pollutants.
9. Structure local building codes to require high recycled content for certain key building materials such as fabrics and metals.
10. Promulgate building energy standards and statutes, setting maximum energy consumption thresholds for public buildings.
11. Require all public structures to be LEED Silver certified.
12. Develop a cross-section for corridors in the Network of Complete Streets that includes “low impact development approaches,” (LIDA) thereby minimizing the impact of storm water, including such strategies and improvements as bio-swales, rain gardens, tree boxes, and grey water reclamation systems.

Chapter 2: Gamechangers, Themes, & Prototypes

"Long range planning works best in the short term."
– Euripides, poet (480-406 AD)

Long Term Factors Affecting the Region

The following list of eight (8) regional change factors have either begun to change the region already, or will be expected to cause significant deep-seated changes at some time during the next two decades. The changes are expected to be major structural changes in the social fabric, the physical environment, and the cultural expression of the region. Plans, projects and recommended policy initiatives in subsequent chapters are devised to respond to these gamechangers in a positive, proactive manner.

1. Interstate 69 Through Henderson, Vanderburgh, and Warrick Counties

2. Indiana University Medical Center

3. Slackwater Harbor and Multi-Modal Facilities Along the Ohio River

4. Aging of the Regional Infrastructure

5 Development of Alternative/Renewable Energy Sources

6 Millennials Come of Age as Boomers Retire

7 Advent of Municipal "Smart Systems" Tracking Water and Electrical Usage

8 Construction of New Convention Hotel in Downtown Evansville

Gamechangers

1. Interstate 69 Through Henderson, Vanderburgh, and Warrick Counties: Interstate 69, when it has been completed from the Pennyrile Parkway south of Henderson to the connection with I64 on the southside of Evansville, will open up major development opportunities throughout Western Kentucky and Southwestern Indiana. A new bridge will be constructed, crossing the Ohio River, east of the present double bridges. The new bridge may require a toll on the Kentucky side of the river to complete financing and final construction.

2. Indiana University Medical Center: The IU Medical Center, Southwest, will be a teaching facility, located within proximity to a regional hospital and other university-related services. Indiana University sources estimate that the initial facility will have a price tag of at least $50 million. This project will spawn other developments such as nursing programs, construction and other health-related permanent jobs, student housing facilities, and numerous economic spin-offs. This gamechanger comes at a time when doctor shortages are being projected based on the healthcare needs of aging baby boomers and the great numbers of new patients seeking care starting in 2014 under the Affordable Care Act. This onslaught of new patients is likely to exacerbate the already acute shortage of doctors and other related healthcare providers in rural areas of the three-county region. The new Indiana University Medical Center, Southwest, can help address these medical service demands and shortages.

3. Slackwater Harbor and Multi-Modal Facilities Along the Ohio River: The United States Army Corps of Engineers is considering the construction of a new riverport east of the Howell Railroad Yards in Evansville's near west side. Known as a Slackwater Harbor, signifying a calming of the strong Ohio River current as it slueces around its bend just past Evansville's downtown, this Inland Port can be developed as an intermodal center comprised of barge, rail, and trucking transport systems for moving freight and commodities. An intermodal development of this type could induce major land use changes in the downtown and near west side of Evansville, while spawning economic impacts throughout the region.

4. Aging of the Regional Infrastructure: Each year, the American Society of Civil Engineers grades the infrastructure of the United States, using the common grading system used in elementary schools throughout the nation: A=Excellent; B=Good; C=Mediocre; D=Poor; F=Failing. The average for all infrastructure systems evaluated for 2013 is a D+. The highest grade received was a B- for Solid Waste Systems. Bridges and Rail Systems both received a C+. Ports received a C and Parks and Recreation received a C-. All other infrastructure components received either a D+, a D, or a D-. In the D category were Aviation, Dams, Drinking Water, Energy, Hazardous Waste, Inland Waterways, Levees, Roads, Schools, Transit and Wastewater Treatment. In the three-county region, combined sewer overflows present a costly challenge over the next 20 to 30 years, with an expected price tag to ratepayers of approximately $500 million. The City of Evansville wants to complete the improvements within a 30 year agreed timeline, while the USEPA wants the project completed within 20 years, according to the Evansville Courier & Press.

Addressing aging and, in some cases, failing infrastructure will be costly and time-consuming. Local jurisdictions may not be able to rely on federal funding to the degree that past generations have relied on it. Local leaders in all sectors - public, private, and philanthropic - must unite in a coordinated effort to prioritize, address, and finance needed infrastructure improvements.

5. Development of Alternative/Renewable Energy Sources: The supposedly imminent onset of "peak oil" and the national effort to become gradually less dependent on foreign petroleum products, demand that we begin to develop our onshore assets for alternative energy sources such as wind, solar, geothermal, hydroelectric, and biomass. While wind energy may not be an option for the Ohio River Valley, solar and hydro power have great potential here. Future energy demand will need to be met with a balanced portfolio of petrol, natural gas, clean coal, and renewables.

6. Millennials Come of Age as Boomers Retire: Individuals in the Millennials Generation, born in the period from 1979 to 1997, are the children of the Baby Boomers. Over the next 25-30 years, this age cohort will set trends and drive demand for consumables, commodities, housing, and transportation modes. Their preferences will determine settlement patterns, dwelling unit densities, and energy alternatives. Surveys conducted with the Millennials reflect attraction to urban places, ease with communication technologies and social media, and preference for face to face social contact in both work and leisure settings. Now reaching or soon to reach their retirement years, the Baby Boomers population group, born in the period from 1948 to 1966 (now aged 48-66) will continue to seek living arrangements in retirement settings that vary from the sunny slopes of Colorado, to the beaches of Florida, and to the fringes of large state university campuses.

7. Advent of Municipal "Smart Systems" Tracking Water and Electrical Usage: With the prevalence of digital technology and the dawning of artificial intelligence in factories, schools, and homes, the possibilities for the electric “Smart Grid” and for monitoring water consumption through “Smart Metering” seem endless. The promise of smart technologies is for much greater efficiency and less waste. As for electric utilities, the opportunity for handling peak load periods and distributing power demand throughout the twenty-four hour period each day, will mean less risk of power brown-outs and fewer periods of down time. In the water delivery arena, smart systems can help detect costly leaks, which were heretofore impossible to track down. Technology and artificial intelligence will make wise allocation of utility resources a reality in the not-too-distant future.

8. Construction of New Convention Hotel in Downtown Evansville: The City of Evansville has been without a convention hotel connected to the Old National Events Plaza (Vanderburgh County Convention Centre) since late 2009. The closing of the Executive Inn caused major regional conventions to bypass Evansville for the past five years in favor of locations with modern hotel rooms and adequate parking. But the City of Evansville will soon break ground on a new $71.3 million development in the downtown, including a 255 room, 10-story hotel, which will be connected to the ONB Events Plaza. This new, modern Double Tree Inn, along with 78 Class A apartments, will give a shot in the arm to the dawdling regional business trade and downtown residential market. Included in the project will also be a 311-space expandable parking garage, necessary infrastructure, streetscaping and sky bridges connecting the hotel to the Arena and the Convention Centre.

Sustainable Infrastructure Investment

Municipalities everywhere are being squeezed by decreasing tax revenues, combined with ever-widening demands for public services. The urban infrastructure is clearly under direct pressure. A widely cited 2007 study by the consulting firm Booz Allen Hamilton placed the price tag of repairing urban water, power, sewer, and transportation infrastructure in the US, over the next 25 years, at around $6.5 trillion. [1] That figure does not even cover new demand or new growth requirements. In 2010, local governments in the US raised and spent $1.6 trillion, representing more than 10 percent of the US gross national product. Of that amount, approximately one-third, or $525 billion, was expended on projects and activities that are heavily affected by local development patterns. [2] Research in other states demonstrates the high fiscal cost of urban sprawl relative to denser, more compact development. For example, research conducted by the Denver Regional Council of Governments in the their plan for Metro Vision 2020 found that sprawl development would cost Denver-area governments $4.3 billion more in infrastructure costs than compact development, through 2020. [3]

1 Association for Pure Water, "Infrastructure Needs Are Stretching Resources," 2009, www.americansforpurewater.com/i4a/pages/Index.cfm?pageID=3388
2 US Census Bureau, September, 2012, "State and Local Government Finances Summary: 2010." Available at http://www2.census.gov/govs/estimate/summary_report.pdf
3 "The Fiscal Cost of Sprawl: How Sprawl Contributes to Local Governments' Budget Woes." By William Coyne, Land Use Advocate, Environment Colorado Research and Policy Center, December, 2003

Sprawl also levies environmental costs. Jacob and Lopez found that storm water runoff volumes, and the amount of phosphorous, nitrogen and suspended solid water pollutants increased with density of development (measured per acre) but declined per capita. The Jacob and Lopez model also showed that doubling standard suburban densities from **four to eight dwelling units per acre** would usually do more to reduce contaminant loading associated with urban growth than many traditional storm water best management practices (BMPs). [4]

4 John S. Jacob and Ricardo Lopez, 2009, "Is Denser Greener? An Evaluation of Higher Density Development As An Urban Stormwater-Quality Best Management Practice," Journal of the American Water Resources Association (JAWRA), Vol. 45, No.3, pp. 687-701

The property tax revenue issue, relative to the wide variety of different possible land use allocations or configurations, is one of the most crucial issues facing local governments today. In many instances, local governments do not know, in any precise manner, what their costs are for servicing various types of land developments, whether in the downtown or at the suburban fringe. Norman Wright, AICP, Director of Development Services for Columbia, Tennessee, has found that one of the best predictors of whether a proposed development will pay its way in tax revenues is the "intensity of development," as measured by the proposed development's floor area ratio (FAR). Mr. Wright has concluded that development that achieves 60 percent lot coverage (0.6 FAR) or higher, will pay for itself, whether it's located in the heart of the urban core or out at the suburban fringe. His conclusion is that municipalities should consider minimum building intensity levels to ensure cost-efficient development. If private individuals decide to build in a less-intensive manner than local prescriptions allow, they should be charged development impact fees or other types of value-add levies that aid local government by having private developments paying their own way. The rest of the tax-paying public should not be expected to subsidize developers or users whose low intensity developments don't raise enough property tax revenue to pay for themselves.

Fiscal constraints at the state and local levels are causing governments everywhere to look for less expensive ways to meet their infrastructure and public service needs. It can be shown that compact growth is less expensive to serve than less dense "sprawl" developments by an **estimated 11 percent nationally**, for the basic infrastructure installation that private developments need. [5]

5 *Costs of Sprawl – 2000*, by R.W. Burchell, G. Lowenstein, W.R. Dolphin et al., Washington, D.C.: Transportation Research Board, National Academy Press, 2002

Extension of Sanitary Sewers

If there is one infrastructure component that has the greatest potential to direct growth, it is surely the sanitary sewer system and its allocated service area. While developers are expected to fund their own sewers, lift and pump stations, city and county leaders and the municipal water and sewer department pay for any "over-capacity" built into the systems delivered by developers, that may provide for subsequent future development. City and county governments, along with their taxpayers, are expected to accept developers' roads and infrastructure, once completed and dedicated to the city or county, and the public is expected to maintain them in perpetuity. Often, developments don't pay their own way, as discussed above, and taxpayers end up subsidizing the long-term maintenance of roads, streets and sewers.

The aging of the sewer systems already in place presents economic challenges to local municipalities across the nation. In the case of the City of Evansville, the need to address the CSO (Combined Sewer Overflow) issue over the next twenty-five years will be very costly, demanding that the best green infrastructure planning be conducted to keep costs down. During intervals of heavy rain in short bursts of time, the older combined storm and sanitary sewers, which are over 100 years old and built of brick masonry, can overflow when storm water flow exceeds the sewer plant capacity. When these "gully washers" occur, sewer overflow gates open up and the system allows raw sewage to be released directly into the Ohio River and its tributary, Pigeon Creek.

To fully meet the US Clean Water Act, Evansville will have to eliminate all of its 22 presently permitted CSO outfalls. The city entered into a "Consent Decree" with the federal government and the State of Indiana in February of 2011 regarding a plan of remedial action on the issue. The city agreed to an overall capital improvements plan (Integrated Overflow Control Plan); a prioritized set of projects dealing specifically with sewer overflow system defects and deficiencies; and a CSO Long-Term Control Plan, overhauling the existing Long Term Control Plan. The city is contemplating a Green Infrastructure (GI) initiative, to reduce the quantity of storm water entering the system, which will necessarily include ordinance changes and financing determinations.

There could be a much less expensive method of solving the CSO problem with our aging combined sewers. The Bill and Melinda Gates Foundation is sponsoring a program that will revolutionize toilets. They have awarded funding to eight universities and identified Lowell Wood, astrophysicist at Lawrence Livermore National Laboratory as project leader, to bring toilet technology, which has not changed much since the Han dynasty latrine from 206 BC. The new toilet requires no infrastructure, no piping, no septic tanks, and no sanitary sewers. These modern wonders will powder and burn feces and flash evaporate urine, turning everything completely sterile. And these toilets actually give back: packets of urea (used as fertilizer), common table salt, liters of water, and enough electricity to charge your cell phone while you're seated, doing your thing. After the installation of the system is in place, the cost of operating this wonder toilet is about five cents per day. [6]

6 *Abundance* by Peter H. Diamandis and Steven Kotler, Free Press, a Division of Simon & Schuster, Inc., 1230 Avenue of the Americas, New York, NY, 2012

The City of Evansville would be money ahead to install these toilets in everyone's home and save the $500 million it has been asked to spend on the Consent Decree. As stated by the authors, Diamandis and Kotler, noted above:

"Toilets account for 31 percent of all water use in America. The USEPA estimates 1.25 trillion gallons of water – the combined annual usage of LA, Miami, and Chicago – leaks from US homes each year, with toilets being the biggest waster. Lastly, in addition to feces and urine, this technotoilet processes all organic wastes, including table scraps, garden cuttings, and farm refuse, thus closing all the loops while providing a family with all the water they might require."

The Vanderburgh County Area Plan Commission and the Evansville-Vanderburgh Water and Sewer Department have done analysis and are recommending the following areas for sewer service extension to direct orderly growth:

- The remaining unserved pockets in the City of Evansville;
- The remaining unserved portions of unincorporated Center and Perry townships;
- The State Road 65 (Big Cynthiana Road) corridor from outer Diamond Avenue (State Road 66) to and including the St. Joseph area; and
- The areas around the Boonville-New Harmony and SR 57/I164 interchanges due to growth expected from the I69 corridor.

In Warrick County sewer extension needs to be contemplated for the Campbell Township area, north of Ohio Township.

State Annexation Policies: New State Revenue to Provide New Services

Annexation of property by cities in Indiana and Kentucky have specific requirements that must be met. In Indiana, either one of two alternative conditions are required:

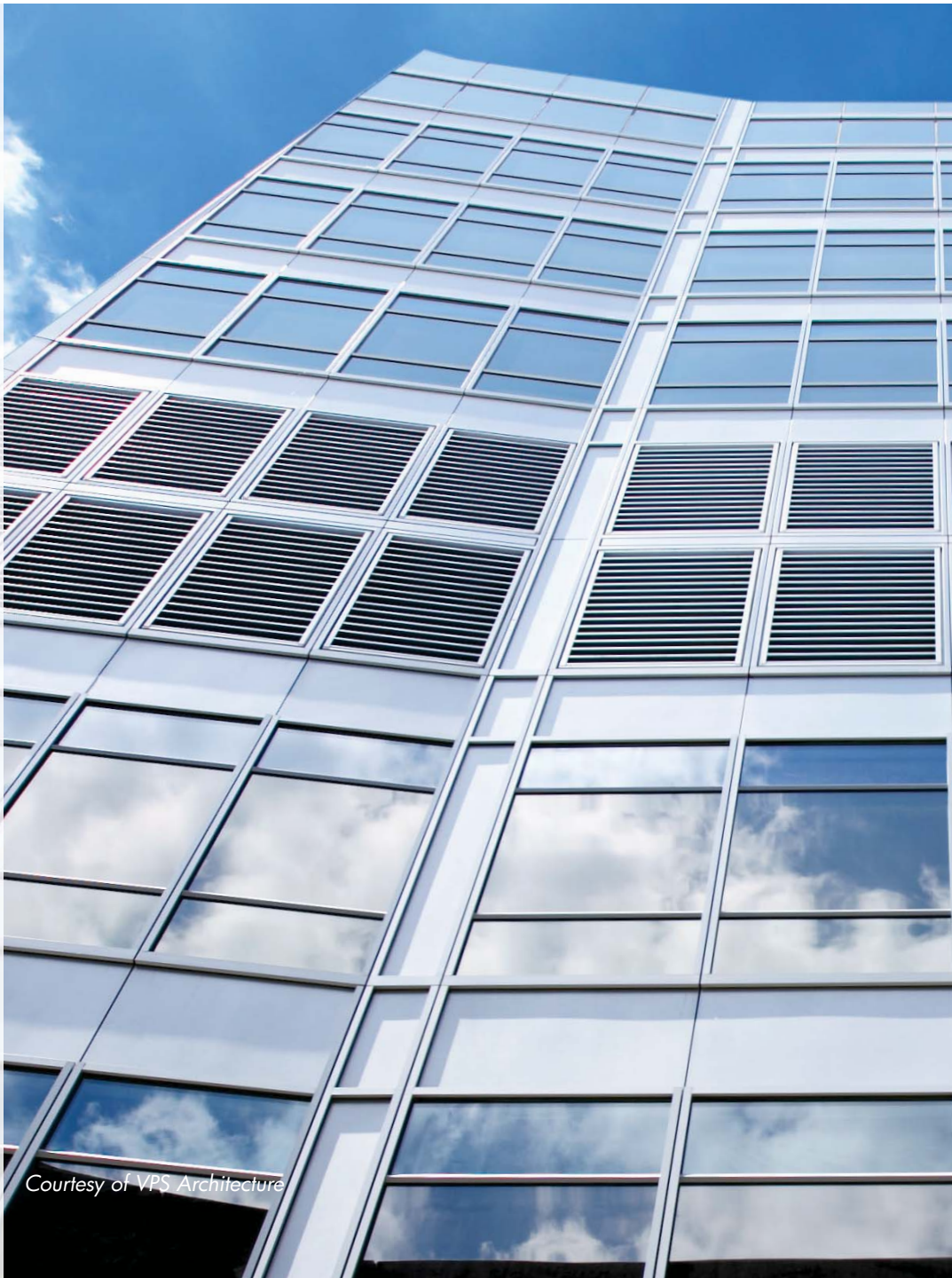
1. The area is at least 1/8 contiguous to present city limits and the density of the territory is at least three persons per acre; 60 percent of the territory is subdivided; or the territory is zoned commercial, industrial, or business; OR
2. The territory is contiguous, except that at least one-fourth (1/4) rather than one-eighth (1/8) of the boundary must coincide with municipal boundaries; and the land is needed and can be used by the municipality for its development in the reasonably near future.

The second criterion in Indiana is more vague than the first and it is open to interpretation. Municipal use of this criterion as the basis for annexation has in some cases resulted in controversy.

According to Kentucky statutes, any city of second through sixth class may extend its boundaries to include any area which meets three criteria:

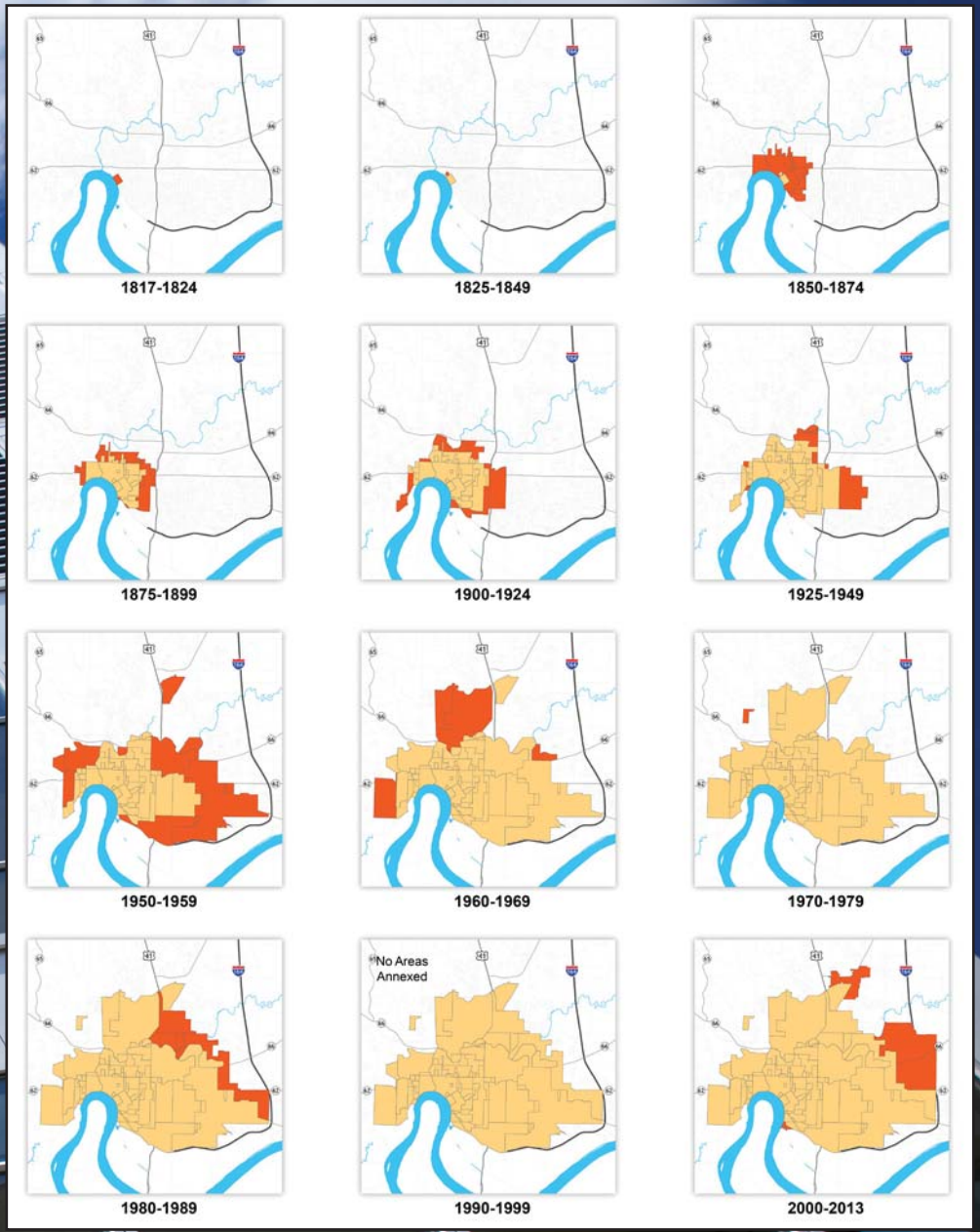
1. Is contiguous to the boundaries of the city at the time annexation proceedings are initiated;
2. Is urban in character or suitable for development for urban purposes without unreasonable delay; AND
3. Does not include any territory that is already within the jurisdiction of another incorporated city, another county, or agriculture district formed pursuant to Kentucky statutes.

Figure 2-1 shows the recent history of annexation in Evansville.



Courtesy of VPS Architecture

Figure 2-1: Annexation Over Time: Evansville



Workforce Housing Near Jobs

Workforce Housing is defined as housing that is affordable for households with a working spouse or spouses whose combined total income falls within the range of 50 percent to 120 percent of the statistical area's median family income. Affordable Workforce Housing cost is defined as total housing costs that do not exceed 30 percent of the household's net income.

In addition to pure housing costs, such as rent and utilities, with the cost of oil rising to over three dollars a gallon, working families are also being pinched by transportation costs, including car payments, auto insurance and fuel. So when both their costs for housing and for transportation are added together (h+t), as shown in the "Performance Indicators" section of this chapter, and this grand total exceeds 50 percent of the family's net income, we can say that the family is "rent and auto burdened." A solution to this condition is affordable Workforce Housing built in proximity to employment centers – where the jobs are.

Successful Workforce Housing programs sometimes directly involve corporations and local businesses in the development and sales or leasing of affordable Workforce Housing. The Jacobsville Neighborhood and its "Jacobsville Join In" efforts are beginning to involve business partners like Berry Plastics, Deaconess Hospital and Vectren in conceiving of Workforce Housing programs that provide safe, clean, affordable housing for their workers, in close proximity to jobs. These efforts do not require subsidies by the local businesses that get involved. Rather these programs utilize expertise, financing sources, organizational capabilities, and good will to conceive of and deliver quality housing.

Theme: Environmental Stewardship

The Regional Plan for Sustainable Development includes policies that are not only good for the natural and man-made environment, but contribute to a sustainable local economy. Restoration of natural and man-made systems, such as riparian habitats and historic buildings, promotes the local economy, creates jobs, and contributes to a cleaner and healthier world for all citizens of this region.

Energy Conservation and Green Building Practices

Energy-efficient buildings are becoming more common due, in part, to more stringent building energy codes. Building to LEED (Leadership in Energy and Environmental Design) and other similar high performance standards such as Energy Star and HERS Ratings can confer building operating savings and user health benefits. The marketability of "green" buildings is becoming more widely accepted by business owners and the general public as time passes. When building conservation strategies have a payback of five years or less, as most well-conceived strategies do, it is not a hard sell to convince small businesses and homeowners to invest in energy saving building systems and materials. With the right type of financing, high value energy improvements can be made without a cash-flow burden because reduced utility bills will more than likely pay for the increased capital costs of such improvements.

LEED certified buildings comply with a checklist of energy-efficient and environmentally-responsible features in categories such as indoor air quality, natural daylighting, sustainable site development, energy and atmospheric issues, water efficiency, recycled materials and resources, and green infrastructure. LEED projects receive points for meeting standards specified and can achieve levels of LEED certified, LEED Silver, LEED Gold, or LEED Platinum attainment. Some municipalities have instituted ordinances requiring their public facilities to achieve one of these levels of attainment.

Courtesy of VPS Architecture

Carbon Sequestration when Burning Coal

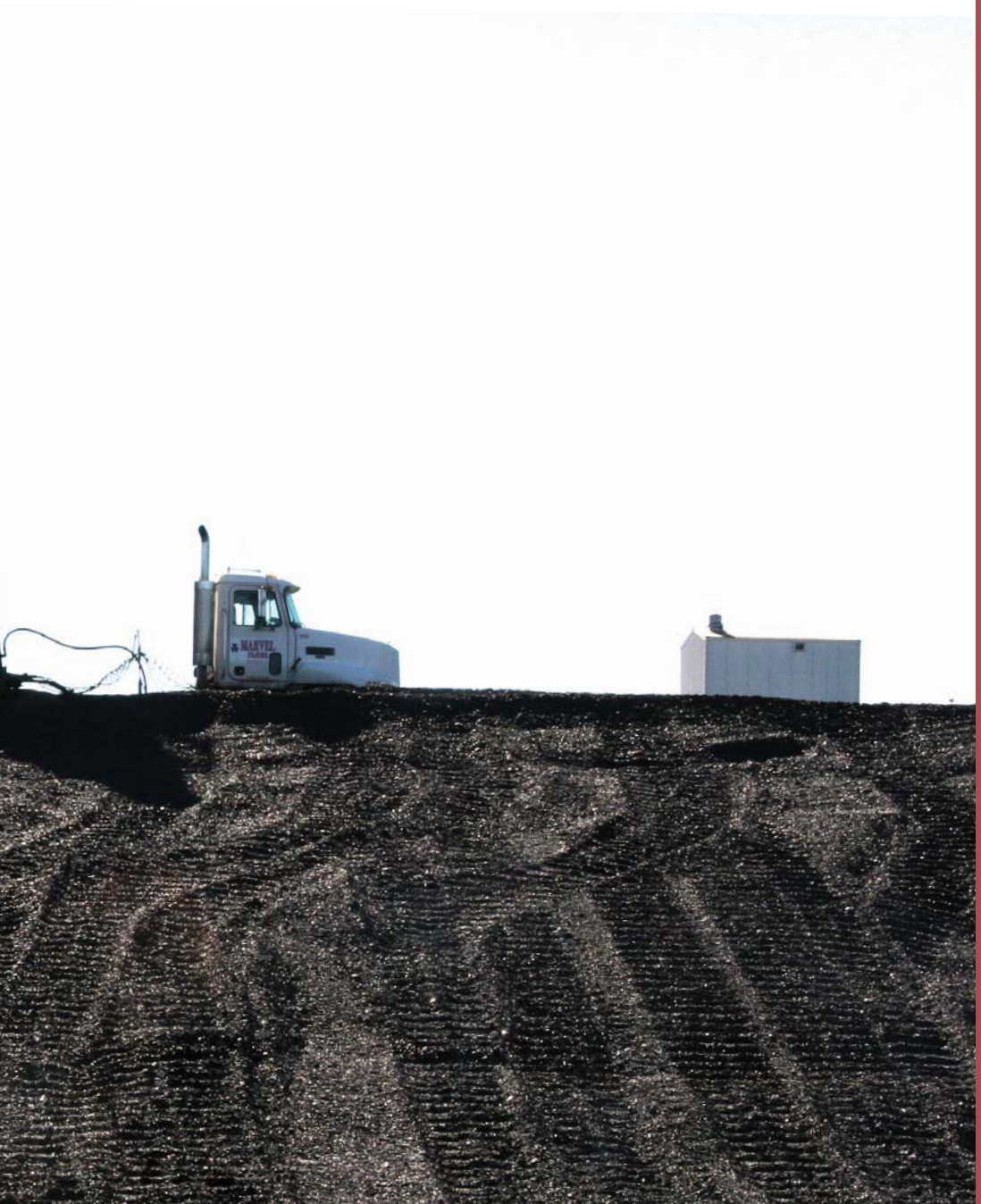
Coal is a plentiful resource in the geography surrounding this three-county area and it has been mined for many years. Around 88 percent of the electricity generated in the State of Indiana stems from coal production. Coal is carbon-intensive, with double the CO2 emissions, per unit of energy produced, from natural gas and half again as much as oil. Natural gas is much less carbon-intensive than coal and cleaner-burning than oil. It is emerging as a "transition fuel" as the world shifts from fossil fuels to renewable energy. [7] Vectren, the energy provider for southern Indiana, foresees natural gas as not only a transitional fuel, but the "foundation fuel" for the future.

Lester R. Brown of the Earth Policy Institute has pointed to the difficulty of getting approvals for building new coal-fired power plants. In his book entitled Plan B 4.0, he points out the following:

Since 2007, we have *"witnessed the emergence of a powerful movement opposing the construction of new coal-fired power plants in the United States. Initially led by environmental groups, both national and local, it has since been joined by prominent national political leaders and many state governors."* [8]

7 International Energy Agency (IEA) World Energy Outlook 2008, Paris: 2008, p. 507

8 *Plan B 4.0* by Lester R. Brown, Copyright 2009 by Earth Policy Institute, pages 249-253



In the United States there have been well over a hundred coal plant projects, in the past eight years, that have been shelved. [9] Despite the so-called "moratorium," new coal technologies are still being developed for retrofitting existing coal-fired power plants, including gasification and sequestration. In order to continually improve air quality in the region, strategies like gasification and sequestration at existing sites are critical. Area universities, utility engineers, and corporate research and development sources could be major worldwide contributors to cleaner air by doing the research necessary to initiate efforts to sequester C02 and use it to nurture algae. This type of clean, green technology could be a huge boost to the local economy of the region. William McDonough, architect, and Michael Braungart, chemist, put it this way:

"But what if, when coal is burned for power, we could design smokestacks to capture carbon emissions and toxins? Instead of shooting the emissions into the atmosphere, where the carbon's value is lost and the air grows filthier, we contain them. We hold onto them.

The Ecological Sequestration Trust in London is funding the creation of substations next to power plants. Instead of the gases going up and out the smokestack, the gases will be funneled into algae greenhouses. Due to the high C02 emissions, the algae grow rapidly, and when the tanks are full, the algae are sent through pipes to another station, where they are anaerobically digested to make biofuel and used for soil enrichment.

There have been many experiments in this area, including advanced work at MIT and other major universities, resulting in various degrees of effectiveness, success and potential for commercialization." [10]

9 John Hofmeister, Former President of Shell Oil, *Why We Hate the Oil Companies*, Palgrave Macmillan, 2011, page 109

10 *The Upcycle* by William McDonough and Michael Braungart, North Point Press, a division of Farrar, Strauss and Giroux, 2013, page 176

Solar

Grid-Connected solar photovoltaic power is the fastest growing energy sector, rising by 60 per cent annually. Wind's growth rate is second, at 28 per cent. The cost of both solar and wind power have halved within the last 15 years. [11] Photovoltaic solar panels are becoming more readily available to homeowners and small businesses. If a family cannot afford a ten or twelve thousand dollar investment in solar panels, leasing of solar systems is now becoming an option. The lease payments can contribute to outright ownership, once the leasing period has been completed. Families are now being set up with solar system monitoring programs that can be called up on an iPad. Most families immediately see at least a ten percent reduction in their electric bill. The payback time, at this juncture, is reported to be twelve to fifteen years. As the technology is refined and the markets widen, it is expected that paybacks in the future may approach ten years. After that, the family benefits by receiving "free" energy.

Future power plant development, toward the 2040 timeline, may be best conducted using wind farms and solar farms. Since Vanderburgh, Warrick, and Henderson Counties are situated in the low-lying Ohio River valley, wind is not likely to be the best, most efficient choice for power generation. But solar, as it becomes more and more economical, will likely be an extremely viable choice for assisting in the powering of the region. While it may not be economical to administer solar on a wide scale at this time, with the cost coming down and solar markets scaling up, within the next two decades, solar farms will likely be making major contributions to power generation.

11 *Renewable City* by Peter Droege, Wiley Academy, a division of John Wiley & Sons Ltd.

Cost Comparison - Coal, Gas, Solar

According to the International Economic Development Council in its 2013 report entitled "Understanding Renewable Energy Businesses: A Survey of Renewable Energy Companies," the competition among natural gas, wind, and solar depends primarily on price points. At the time of the study, the EDC reported that the U.S. Energy Information Administration, who tracks the most recent levelized cost (cost to build and maintain a plant) for different generation sources, had found the most current pricing to be as follows:

- The levelized cost for a coal plant was $100.10 to $135.50 per megawatt hour, depending on the particular technology, the location and the size of the plant. Coal gasification technology, using coal more efficiently than traditional pulverized coal, has a higher up-front cost, perhaps as much as 20 percent. Attaching carbon reduction or elimination technology onto the typical coal gasification technology, will add no less than an additional 20 percent to the overall cost. At that rate, using gasification and sequestration is comparable in cost to the current costs of solar photovoltaic plants. [12]
- For a natural gas plant, the levelized cost is $65.60 to $130.30 per megawatt hour, depending on the same factors as above.
- A wind plant's average levelized cost is $86.60 per megawatt hour, but there must be strong, dependable wind patterns to make the plant a feasible investment.
- Solar photovoltaic plants right now cost $144.30 per megawatt hour, likewise depending on the details of the technology and the circumstances surrounding the plant site and its size.

12 John Hofmeister, former President of Shell Oil Company, *Why We Hate the Oil Companies*, Palgrave Macmillan, 2011, page 105

Green Roof Image Courtesy of VPS Architecture

It is not difficult to see why natural gas is being portrayed as the "foundation fuel" as we move closer to the era of renewables. As solar energy becomes more competitive and capable of benefiting from technological improvements and scalable markets, it will be a solid investment for this region. But that prospect may take a decade or two to materialize. Until then, natural gas, recently discovered to be more plentiful due to hydraulic fracturing will likely be the foundational fuel needed to keep systems running. There is, theoretically, so much natural gas available in the United States due to "fracking" potential that many industry experts are convinced the wellhead price will remain very low, possibly below $4.00 per thousand cubic feet for the next decade or two. [13] The environmental effects of "fracking" have not been thoroughly researched and documented at this time, so we are not certain about its long term impacts. It remains to be seen whether hydraulically fracturing shale layers, by injection of liquids, has any lasting negative impacts on drinking water, seismic shifting, or soil fertility. Ultimately, state agencies such as the Department of Environmental Management and the Department of Natural Resources in Indiana will have to closely monitor and regulate hydraulic fracturing in order to preserve water quality.

13 *Energy for Future Presidents*, by Richard A. Muller, W.W. Norton & Company, Inc., 2012

Renewable Energy-Powered Vehicles

A major strategy to cut back on our dependence on foreign oil is the production and use of renewable energy-powered vehicles such as electric-powered automobiles. PRTM, a global management consulting firm, projects that by 2020, the value chain for electric vehicles will be approximately $300 billion, creating more than one million jobs in the international economy. If the United States is aggressive in its pursuit of this promising market, more than 275,000 of these vehicles could be produced by US car manufacturers. [14] For this evolution to continue unabated, we will probably need charging points in urban areas for plug-in vehicles and hydrogen fuel cell vehicles by 2030, providing a distributed infrastructure for sending electricity back and forth within the electrical grid. So by the horizon year of 2040, the PRTM estimate reflects that around 75 percent of all light-duty vehicle miles traveled might be electrically powered. [14] By some accounts, this estimate may be aggressive considering the possibility of liquefied natural gas (LNG) as a viable foundation fuel for transportation, as gasoline supplies dwindle and pump prices increase.

Alternatively powered vehicles, specifically hybrid and plug-in electric vehicles, have the ability to contribute excess power to the electrical grid. They can be thought of as "power plants on wheels." Cars are parked 90 percent of the time, so there is great potential to plug them back into an interactive grid. [15]

14 PRTM Analysis Shows Worldwide Electric Vehicle Value Chain to Reach $300 B+ by 2020, Creating More than 1 Million Jobs [Press Release]. Retrieved from http://www.prtm.com/NewsItem.aspx?id=3609&langtype=1033

15 *The Third Industrial Revolution* by Jeremy Rifkin, Palgrave MacMillan, a division of St. Martin's Press LLC, New York, NY, 2011

Clean Diesel versus Compressed Natural Gas Buses

The cost of one Compressed Natural Gas (CNG) transit bus, on average in 2012, was approximately $70,000 more expensive to purchase than an equivalent diesel bus. Transit agencies that have not previously invested in new CNG fueling stations, would also face a cost of $25,800 or more per bus, to provide fueling stations. However, natural gas, on average in 2012, cost approximately 35 percent less than diesel fuel per diesel gallon equivalent. Annual maintenance and operating costs (other than for fuel) are assumed to be about the same for diesel buses and CNG buses. The US Energy Information Administration (EIA) projecting out 20 years, predicts that natural gas will continue to be priced substantially lower than diesel fuel. In capital-constrained budgeting years, the higher initial acquisition price for the CNG buses may limit the number of new CNG buses as compared with diesel buses. For example, in increments of $10 million in capital funding, an agency may be able to purchase 26 new diesel buses or 21 new CNG buses, along with the required CNG fueling structures.

The comparative cost analysis, done by Strategic Environmental Consulting, indicates that the pay-back period on the incremental purchase cost of CNG buses and fueling infrastructure, as compared with diesel buses, is between five and eight years. [16] From this assessment, lifetime net savings to transit agencies buying CNG buses versus new diesel buses could total between $50,000 - $80,000 per bus over a transit bus's 12-15 year life.

16 "Clean Diesel versus CNG Buses: Cost, Air Quality, & Climate Impacts" by Dana Lowell and staff, MJ Bradley & Associates, Strategic Environmental Consulting, memo to Conrad Schneider, Clean Air Task Force, February 22, 2012

In terms of greenhouse gas (GHG) emissions, the analysis depends considerably on assumptions about CNG leakage during natural gas production. The question of "fugitive methane" emissions, when factored into the GHG calculations in generous proportions, can reflect new diesel bus GHG emissions that are less than the CNG buses. However, if leakage of fugitive methane from natural gas production is assumed to be zero, then per-mile GHG emissions from CNG buses would be a total of 16 percent lower than GHG emission from new diesel buses. Given the likelihood of some level of gas leakage, the savings levels are likely to be something less than 16 percent.

Farming and Urban Agriculture

Agriculture and farming have long been staples of the economies of both Indiana and Kentucky. The Indiana Business Research Center credits the farm sector in Indiana for 190,000 Indiana jobs. Preservation of prime farmland in Kentucky and Indiana are critical to these states' economic future, and to feeding the rest of the world. River Valleys in both states are endowed with rich, fertile soils. Growing seasons are just right for corn, soybeans, and other foodstuffs. Geographer Stephen Visher wrote, in comments about the region, that "During about nine months in the year the temperatures are more favorable than prevail in most of the world." [17]

17 Andrea Neal, adjunct scholar with the Indiana Policy Review Foundation, Evansville Courier and Press Editorial dated July 17, 2013, aneal@inpolicy.org

Energy and environmental issues have opened up the debate about the best strategies for food production and food security. The notion that it makes sense to produce food locally, in and around our neighborhoods and both in and on the fringes of our cities, has gained wide acceptance. This vision of urban agriculture has spawned numerous non-profit organizations and farmers' consortia that bring community gardens and farmers' markets to the city and suburbs, supplying fresh, often organic produce to the public. Food- and plant-growing activities in urban areas can range from window boxes in high density housing developments to homes with kitchen gardens, to quarter-acre garden plots, or even multi-block urban farms.

Recently developed community gardens in the area include the following:

- **Memorial Baptist Church Community Garden**
  605 Canal Street
  Evansville, IN
- **Jacobsville Park Community Garden**
  900 block of Baxter Avenue
  Organized by Jacobsville Join In
  Evansville, IN
- **Henderson East End Community Garden**
  1016 Washington Street (between Meadow and Julia)
  Organized by Engage Henderson
  Henderson, KY
- **Howell Park Community Garden**
  1004 South Barker Avenue
  Organized by One Life Church
  Evansville, IN
- **Glenwood Neighborhood Community Garden**
  900 block of Sweetser Avenue (on Glenwood School site)
  Organized by Habitat of Evansville, the Glenwood Neighborhood Association, and the Evansville-Vanderburgh School Corporation
- **Tri-State Food Bank's Kids' Crop**
  801 Michigan Street
  Evansville, IN
- **Master Gardeners Community Display Garden**
  3500 E. Lloyd Expressway
  Evansville, IN
- **Patchwork Central Community Garden**
  100 Washington Avenue
  Evansville, IN
- **Westbrook Community Garden**
  5901 N. St. Joseph Avenue
  Evansville, IN
- **University of Evansville Community Garden**
  Lloyd Expressway near the Old Evansville Armory
  Evansville, IN
- **Culver Community Garden**
  1301 Judson Street
  Evansville, IN

Urban Forestry

The Urban Forestry Department of the City of Evansville lists the following benefits of trees in business districts on its website:

- Increase property value by more than 20 percent. This "curb appeal" can be especially important when trying to attract real estate investors.
- Screen unsightly areas, reduce high winds from open areas or highways, and reduce noise from traffic or other loud sources – can be done by planting hedges/rows of trees.
- Decrease cooling costs in the summer by as much as 50 percent through shading, making the environment around businesses cooler and more inviting to customers.
- Reduce the resurfacing time of streets by 6-13 years through shading protection, thereby reducing maintenance costs by 50 percent.
- Reduce stormwater accumulation along city streets and business district parking areas by intercepting rainfall.
- Reduce pollutants in air and water by taking up carbon dioxide and particulate matter through natural gas and liquid exchanges. This factor is especially important in commercial areas where green space is scarce and vehicular traffic is high.
- Improve the overall psychological well-being of people. Trees make people healthier psychologically by promoting relaxation, relieving mental fatigue, and reducing aggression, thereby helping to increase social interaction and lower crime rates. These qualities increase the overall appeal of a business district to tourists and visitors.

Forestry efforts in our urbanized areas have become popular but reforestation efforts can also make substantial contributions to the sustainability of a region. For example, Uttar Pradesh, India's most populous state, mobilized 600,000 people to plant 10.5 million trees in a single day in July of 2007, putting more trees on farmland, in state forests, and on school grounds. "Tree mobilization" blitzes are a great way to reforest and restore the natural environment. [18]

Restoring strip mined sites and brownfields by creating new parks and green spaces can add richness and beauty to our suburban and rural areas. The Forestry and Tree Cover Plan, in Volume 2, Chapter 5, shows areas of potential reforestation, for enhanced and intense tree planting.

18 *Plan B 4.0*, by Lester R. Brown, Earth Policy Institute, 2009

Soil Conservation and Erosion Control

In 1985, the US Congress created the Conservation Reserve Program (CRP) to reduce soil erosion and control overproduction of basic commodities. By 1990 there were close to 14 million hectares (or 35 million acres) of otherwise erodible land with vegetative cover under 10-year contractual agreements. Under this program, farmers were paid to raise fragile cropland or trees. The retirement of those 14 million hectares along with other conservation practices on around 37 percent of all of US cropland, reduced soil erosion from 3.1 billion tons of soil to only 1.9 billion tons during the period from 1982 to 1997. [19]

More recently, the State of Indiana has introduced statutory requirements for construction and landscape changes that protect land from soil erosion. Indiana's Rule 5 requires an erosion control plan for projects affecting one or more acres of ground. The inspection and monitoring of Rule 5 provisions is by the local Soil and Water Conservation District.

19 Conservation Reserve Program: Status and Current Issues by Jeffrey Zinn, [Washington, DC: Congressional Research Service], May 8, 2001

The Smart Grid

Electricity is an essential element of modern culture. Without it, society would necessarily revert to lifestyles typical of the mid-nineteenth century. When power is lost temporarily, major disruptions occur in every aspect of our lives - at home, at work, at school - virtually everywhere. Electricity is used in important processes such as the growth and distribution of food and the pumping and treatment of water. The moving and treating of our potable water consumes more electricity than almost any other single municipal public or private function.

The structure of today's typical electrical grids is essentially the same as it was when first designed, over a century ago. Key features of the conventional grid that could be impacted by changes needed to transition to the Smart Grid are as follows:

1. "centralized sources of power generation;
2. unidirectional flow of energy from the sources to the customer;
3. passive participation by the customers, customer knowledge of electrical energy usage is limited to a monthly bill received, after the fact, at the end of the month;
4. real-time monitoring and control is mainly limited to generation and transmission, and only at some utilities, does it extend to the distribution system; and
5. the system is not flexible, so that it is difficult to either inject electricity from alternative sources at any point along the grid, or to efficiently manage new services desired by the users of electricity." [20]

20 "Smart Grid: The Electric Energy System of the Future" by Hamid Gharvi, Fellow IEEE, and Reza Ghafurian, Fellow IEEE, from Proceedings of the IEEE, Volume 99, No. 6, June 2011

Key requirements of a working Smart Grid can be summarized as follows:

1. "allow for integration of renewable resources to address global climate change;
2. allow for active customer participation to enable far better energy conservation;
3. allow for secure communications;
4. allow for better utilization of existing assets to address long term sustainability;
5. allow for optimized energy flow to reduce losses and lower the cost of energy;
6. allow for the integration of electric vehicles to reduce dependence on hydrocarbon fuels;
7. allow for the management of distributed generation and energy storage to eliminate or defer system expansion and reduce the overall cost of energy;
8. allow for the integration of communication and control across the energy system to promote interoperability and open systems and to increase safety and operational flexibility." [20]

The Smart Grid integrates information and communications technology (ICT) into the power system architecture to make it more cost effective, efficient, reliable and cleaner. The power customer will also have actionable information about his/her use of energy and how he/she can control and allocate costs when connected to an advanced Smart Grid.

On March 5, 2004, Andres Carvallo defined an advanced Smart Grid as follows: "An advanced Smart Grid enables the seamless integration of utility infrastructure, with buildings, homes, electric vehicles, distributed generation, energy storage, and smart devices to increase grid reliability, energy efficiency, renewable energy use, and customer satisfaction, while reducing capital and operating costs." [21] Later, in 2009, the US Department of Energy (DOE) published a handbook on the Smart Grid making a distinction between a "smarter grid" and a "Smart Grid." The former is achievable today, while the latter is a vision of what can be achieved in the future as new technologies come on line and as multiple transformations and iterations continue to modify the current grid structure.

A true Smart Grid would essentially be a distributed mesh network, very similar to the Internet, that would allow an exchange of power between a multitude of producers and consumers over local and regional networks. It would be a desynchronized system wherein users could put power into the system, or take it out, just as easily as computers, phones or modems interface with the Internet today. Costs and benefits of the distributed mesh network need to be considered before jumping headlong into a mesh network program. Cisco has made a major commitment to the construction of the Smart Grid. Cisco believes that society is moving rapidly toward a situation in which every device that consumes electricity could have an IP address and would be a part of a "distributed intelligence." Cisco believes that these innovations will be capable of doubling or trebling the efficiency of buildings and whole communities. [22]

21 *The Advanced Smart Grid: Edge Power Driving Sustainability,* by Andres Carvallo and John Cooper, Artech House, 2011
22 *Abundance: The Future is Better Than You Think,* by Peter H. Diamandis and Steven Kotler, Free Press, A Division of Simon & Schuster, Inc., 2012

An advanced, smarter Smart Grid is an inevitability given the electrical climate today: the need to provide ever more power, due to greater demand, at better quality. It appears that the electric industry nationwide has yet to fully embrace recent lessons from the Internet, which presents an entirely new architectural model for the needs of the twenty-first century. The future of the electric grid is likely to be based on two models: the architecture of the Internet and the system of basic networks in nature that are sustainable, flexible and adaptable. The Smart Grid will be needed given the dawning of distributed generation devices such as rooftop solar photovoltaic systems, microgas turbines that use combined heat and power, and micro-wind systems.

According to Carvallo and Cooper, cited above, "The new grid architecture itself will have been reinvented from its traditional radial design with relatively predictable, one-way power flow from a few generators out to passive, dumb loads on the edge, to a Web design with highly dynamic, unpredictable two-way power and information flow from hundreds of thousands of generators and storage units sitting alongside intelligent, active loads that also participate in keeping the grid in harmony."

Theme: Smart Systems

Vectren, the local gas and electric power company for Evansville, is currently making strides toward the Smart Grid. It is instituting components of the Smart Grid into current distribution and transmission modernization efforts. In the past, Vectren applied for federal Smart Grid grants that would allow its entry into the Smart Grid arena on a much wider basis within its service area. The Smart Grid Investment Grant (SGIG) program was authorized by the Energy Independence and Security Act of 2007 with the purpose of accelerating the modernization of the nation's electric transmission and distribution systems and promoting investments in Smart Grid technologies, tools, and techniques that increase flexibility, functionality, interoperability, cybersecurity, situational awareness, and operational efficiency. The SGIG projects were selected through a merit-based, competitive solicitation by which successful projects were eligible to receive federal financial assistance for up to 50 percent of eligible costs. There was significant interest from the electrical industry regarding the SGIG grant and there were only 99 SGIG projects, with a total budget of $8 billion, approved nationally. Only two projects were selected in the State of Indiana and they were much smaller than the Vectren proposal. In conjunction with this Regional Plan for Sustainable Development, it is hoped that Vectren will be given a high priority in any future federal grant programming. For now, any investments made locally in Smart Grid initiatives will come at a higher cost than to those who are receiving federal grant funding.

In the meantime, as rooftop solar photovoltaic systems become more affordable, more private users will be dialing into the net metering program and generating their own electrical power. Once the distributed energy movement gets momentum, there is the possibility that Vectren might decide to partner with local construction companies to develop "smart" buildings that could serve as micro power plants, feeding locally generated electricity back to the grid. Right now, in the United States, approximately 50 percent of total energy and 74.5 percent of electricity is consumed by buildings. [23] Electrical power demand can be significantly reduced by going green and constructing LEED certified buildings as previously discussed in item "Green Building Practices," on page 30.

23 US Energy Information Administration, 2008, December. *Annual Energy Outlook 2009 Early Release: Tables 2, 4, 5, and 18*. Retrieved from http://www.eia.doe.gov/oiaf/aeo/aeoref_tab.html

Smart Metering

There is some familiarity with the Smart Grid concept relative to the electric grid. But not everyone knows about the savings and conservation potential of the "Smart Grid for Water." At present, 70 percent of our water use is for agriculture, yet we throw away approximately 50 percent of the food that is produced. About 5 percent of our total energy use goes toward pumping water from lower elevations to higher ones, for domestic water usage. Yet, 20 percent of all of our water gets lost through holes in our aging infrastructure, through leaky piping.

The solution to so much wasted water is to create an intelligent network for all of our waterworks systems. The plan is to install sensors, smart meters, and robot driven automation into our pipes, sewers, rivers, lakes, reservoirs, and harbors. And maybe someday we can extend these intelligent systems into our oceans. Mark Modzelewski, executive director of the Water Innovations Alliance, believes this type of smart grid for water will save the US about 30–50 percent of its total water usage. [24]

On July 11, 2013, the City Council of Evansville wisely began the process of creating a Smart Water Metering system. Intensive analysis by the Evansville Water and Sewer Utility staff and consultants resulted in a Smart Water Metering project that will save thousands of dollars annually. This project is a major first step toward an entire Smart Grid for the sewer and water infrastructure of Evansville.

24 *Abundance* by Peter H. Diamandis and Steven Kotler, Free Press, a division of Simon & Schuster, Inc., 1230 Avenue of the Americas, New York, NY, 2012

Compact, Balanced Growth Along Corridors

As stated previously, a primary component of this Regional Plan is encouraging the location of future development along or in direct proximity to established community corridors, where infrastructure is already in place, at densities of eight (8) to sixteen (16) dwelling units per acre or greater. A variety of transportation modes should be further developed along these corridors, including pedestrian trails, bicycle paths, auto lanes and bus rapid transit routes.
In order for any bus rapid transit lanes to be effective, certain minimum densities in dwelling units per acre must be achieved. Therefore, recommendations for exploring bus rapid transit in the 2014-2040 time window are predicated on land use allocation and development that achieves required densities. In his book, *Green Metropolis*, David Owen quotes land use and transit consultants to the effect that the threshold or minimum density for public transit is around seven (7) dwelling units per acre. [25] Boris Pushkarev and Jeffrey Zupan recommend the following densities (dwelling units per residential acre):

- "Bus (minimum service at 20 buses per day) requires 4 d.u. per residential acre;
- Bus (intermediate service at 40 buses/day) requires 7 d.u. per residential acre;
- Bus (frequent service at 120 buses per day) requires 15 d.u. per residential acre." [26]

25 *Green Metropolis*, by David Owen, published by the Penguin Group, 2009, page 120
26 "Where Transit Works: Urban Densities for Public Transportation," in Urban Transportation: Perspectives and Prospects, ed. By H.S. Levinson and R.A. Weant, Eno Foundation, 1982

The Institute of Transportation Engineers (1989) recommends the following minimums:

- "One bus per hour requires 4-6 dwelling units per residential acre; 5,000 to 8,000 square feet of commercial/office.
- One bus per half hour needs 7-8 dwelling units per residential acre; 8,000 to 20,000 square feet of commercial/office.
- Light rail & feeder buses needs 9 dwelling units per acre; 35,000 to 50,000 square feet of commercial/office."

Marcia Lowe recommends at least 7 dwelling units per residential acre for local bus service and 9 dwelling units per residential acre for light rail. [27]

Sacramento Rapid Transit recommends at least 10 dwelling units per residential acre within ¼ mile and 5 dwelling units per residential acre outside of that for bus service, and 10 dwelling units per acre for light rail service. [28]

Snohomish County planners similarly found 7-15 dwelling units per residential acre can support frequent local bus service. They found that a large, pedestrian accessible area at these densities might even support light rail. [29]

27 "City Limits," by Marcia Lowe, World Watch, January 1992
28 Sacramento Rapid Transit, "Design Guide for Bus and Rail Facilities," Sacramento, California, 1989
29 Snohomish County Transportation Authority, "A Guide to Land Use and Public Transportation for Snohomish County Washington," December, 1989

Public officials should be under no delusions about the energy economies of using bus transit services when there is not adequate residential density and therefore inadequate ridership. Buses carry more people per pound of vehicle than the automobile, so officials may believe bus service automatically gives more miles per gallon per person. Bus service would give more miles per gallon if buses were always full of riders. So public transportation can save enormous energy when used in crowded urban environments, but it can waste energy when used in very low density suburbs or in the countryside. If buses aren't full or if they have to make round trips during rush hour – being empty on return – they may not save net energy over automobile transportation.

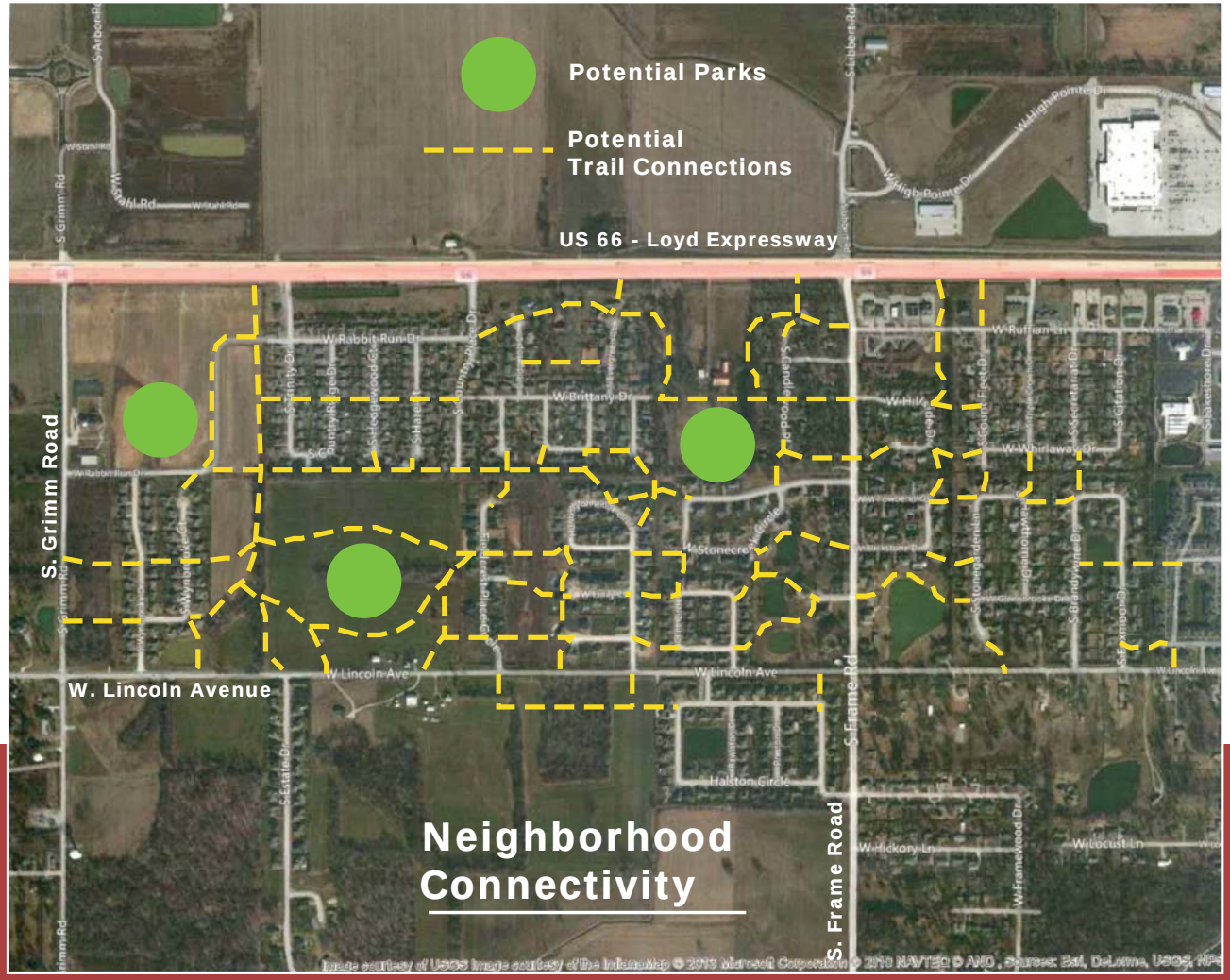
A detailed study of bus transportation in suburbs around the country, done by the Institute of Transportation Studies at Berkeley, found that average suburban break-even points are determined by housing and population density. It seems that if there are more than 15 homes per acre being served, the public transportation works to save on net energy costs. If the housing density is lower than that, the use of buses for public transportation increases energy usage. [30]

30 *Energy for Future Presidents*, by Richard A. Muller, W. W. Norton & Company Ltd., New York, 2012

Figure 2-2: Existing Neighborhood BEFORE Trail Connections

Figure 2-2 and Figure 2-3 show residential development in Warrick County near the Wellness Trail and Medical District. Figure 2-2 is the area as it is presently developed, at the time of this writing. There are several cul-de-sacs that end abruptly, with the presumption that future extensions may occur as this area grows and fills in. Figure 2-3 depicts the area if sidewalks are required and if developers begin to think about adding pedestrian trails to their developments, as amenities that can add walkability to the neighborhood. Enhancements such as gazebos, shade shelters, picnic shelters, water fountains, and even splash pads for the children, can all enliven the neighborhood, making it special.

Figure 2-3: Neighborhood AFTER Greenway and Trail Connections



The present fragmented, stop and start character can give way to a more connected condition, just by adding a few walking and biking trails. These trails can link all of the amenities mentioned above. When neighbors get outside and use these trails, they will be better able to meet, greet and socialize. A genuine neighborhood feel will begin to develop. Folks become healthier, happier, and more fulfilled.

Prototype Development

In developing the various prototypes for land use and housing development, a compact urban neighborhood approach has been proposed for a variety of sensible reasons, including lower infrastructure costs, more affordable housing, less travel time (which means more time spent with family and friends), lower heating bills, lower automobile operating costs, less water consumption, fewer parking lots, less paving, healthier lifestyles, and the ability to respond to the "gamechangers" listed at the beginning of this chapter.

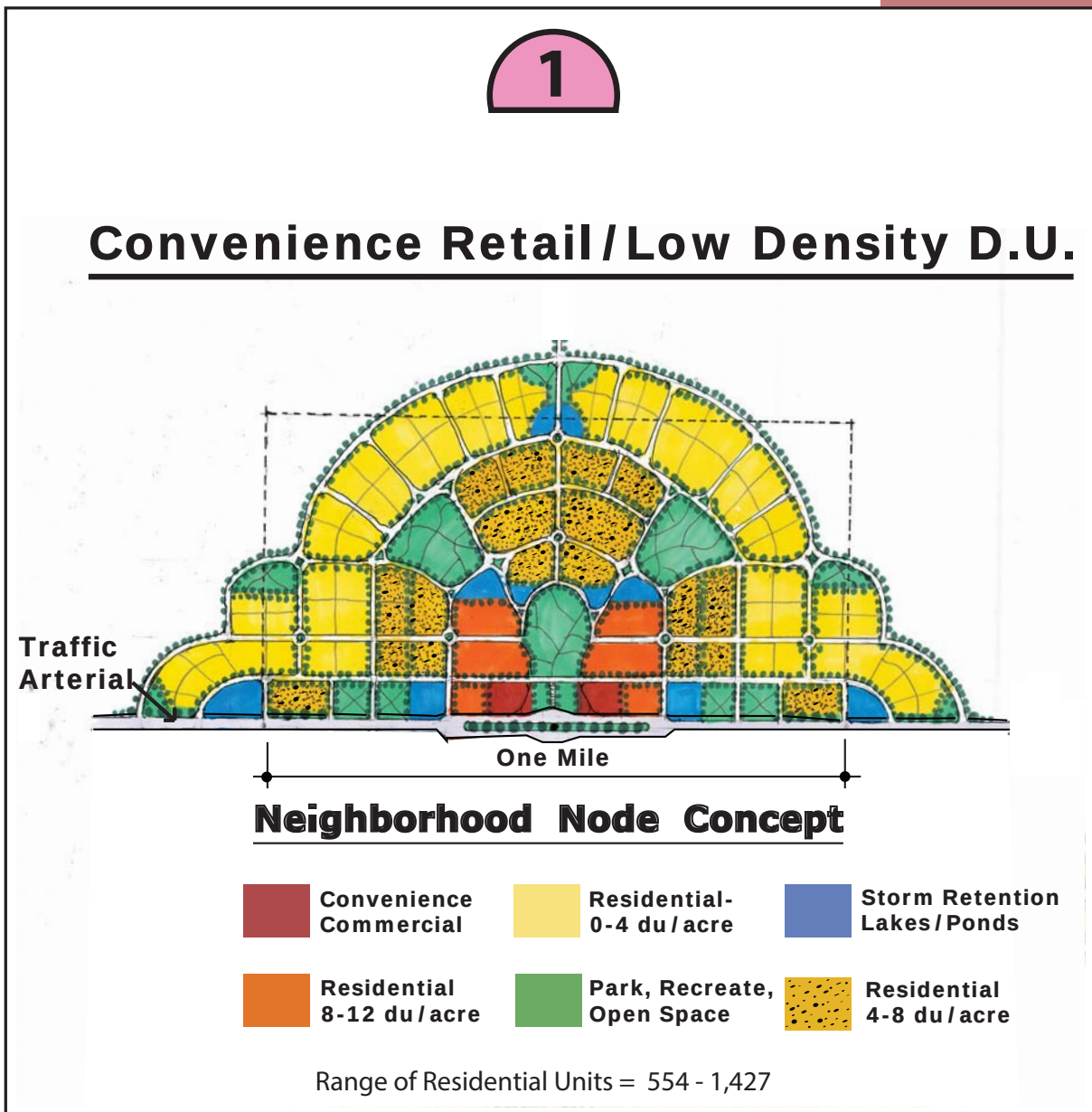
As these prototypes are unfolded, the point is not to precisely predict future land use and development patterns but to bracket the future and examine its critical inflection points or points of change, in order to try to understand what really matters, along with all of the critical choices that will need to be faced along the way. Ideally, we can also try to predict the impacts of the variety of choices. Ultimately, the goal is to study the outcomes of a range of possible futures so we can plan proactively based on the best information we have.

Neighborhood Nodes

Figure 2-4, Figure 2-5, and Figure 2-6 illustrate the idea of using the Neighborhood Node as the basic building block of future mixed use, mixed income balanced growth, whether within existing corporate limits in revitalization efforts, or on the suburban fringe in "greenfield" locations served by previously-extended infrastructure. The Nodes occupy approximately one mile by one half mile (see diagram) and have a bus stop at the center of the denser nodes, from which one can walk a half mile in each direction to the outer fringes of the Node. At the core of the Node, mixed land uses including retail, service and entertainment are interspersed with housing above, in lofts, and in townhouse arrangements. One of the primary intentions of the Neighborhood Node Concept is to develop walkable communities where pedestrian trails and bikeways abound. The designs of Neighborhood Nodes are multi-modal, with the prospect of being connected to other Neighborhood Nodes and other bus stops within the larger region.

Courtesy of VPS Architecture

Figure 2-4: Neighborhood Node Concept #1



Referring to the "Life Cycle Housing and Housing Densities" outline in Volume 2, Chapter 3, page 75, a listing of housing types with likely age groupings and densities is shown. In the low density category are single-family homes and workforce housing on zero lot lines. The densities on Neighborhood Node #1 range from 0 to 12 dwelling units per acre. The small area of commercial development is intended for simple convenience shopping by local residents of the neighborhood area. This node could be developed with mostly single-family homes. The small attached housing area (8 – 12 dwelling units per acre) may be accomplished with the development of townhouses, condos, cottages or villas.

See the "Life Cycle Housing and Housing Densities" discussion in Volume 2, Chapter 3. All housing categories from that outline, from 0 to 16 dwelling units per acre, are shown. However, in this Concept, the 12 – 16 unit apartment area is fairly limited in size and, therefore, number of units. The apartment units are meant to be developed in a "mixed use" configuration, as second story (loft) housing, or "live-work" space, above offices, galleries, craft shops or retail stores. The retail and commercial land use shown in the node involves a local "town center," mixed use shopping arrangement.

Figure 2-5: Neighborhood Node Concept #2

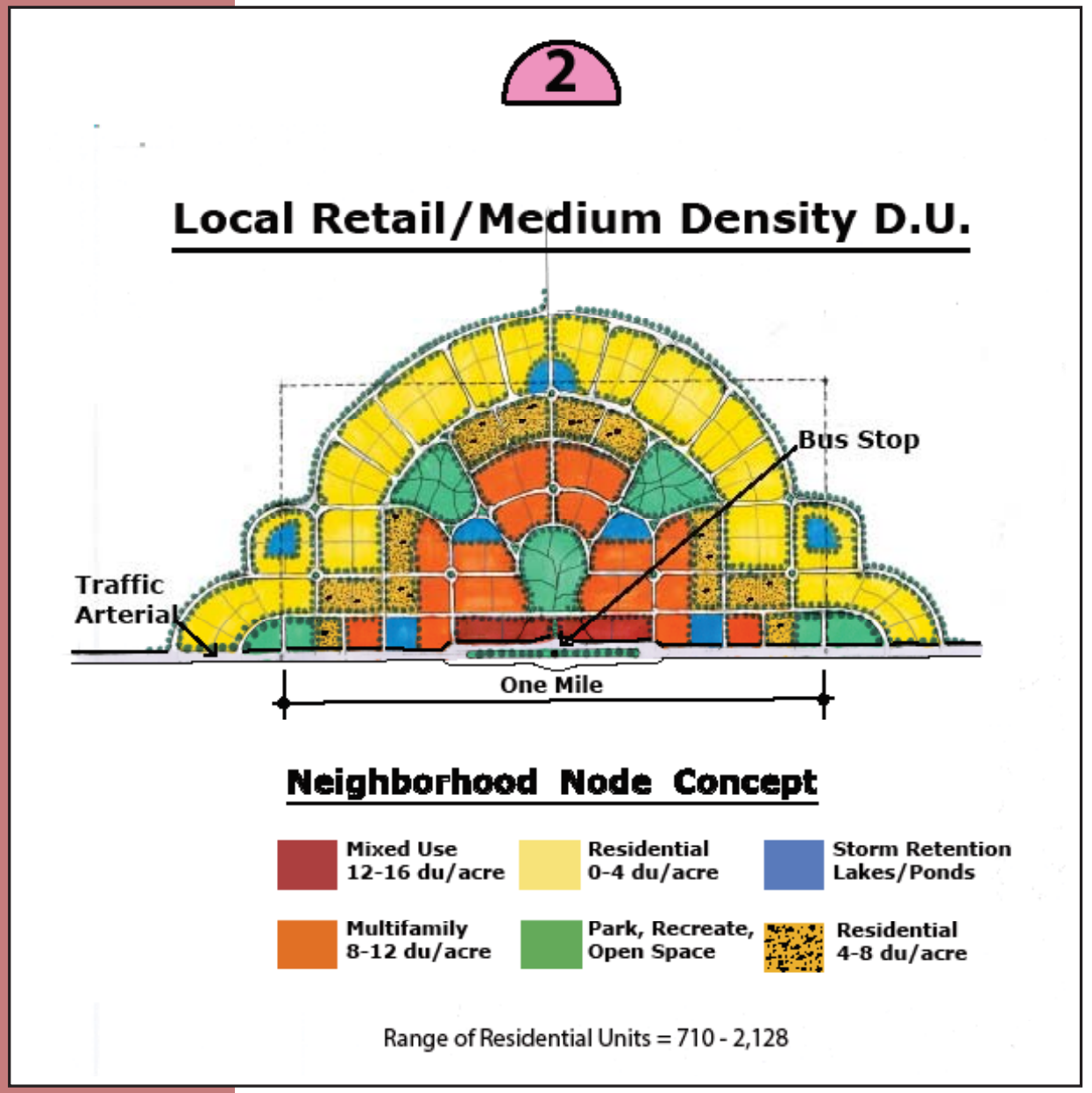
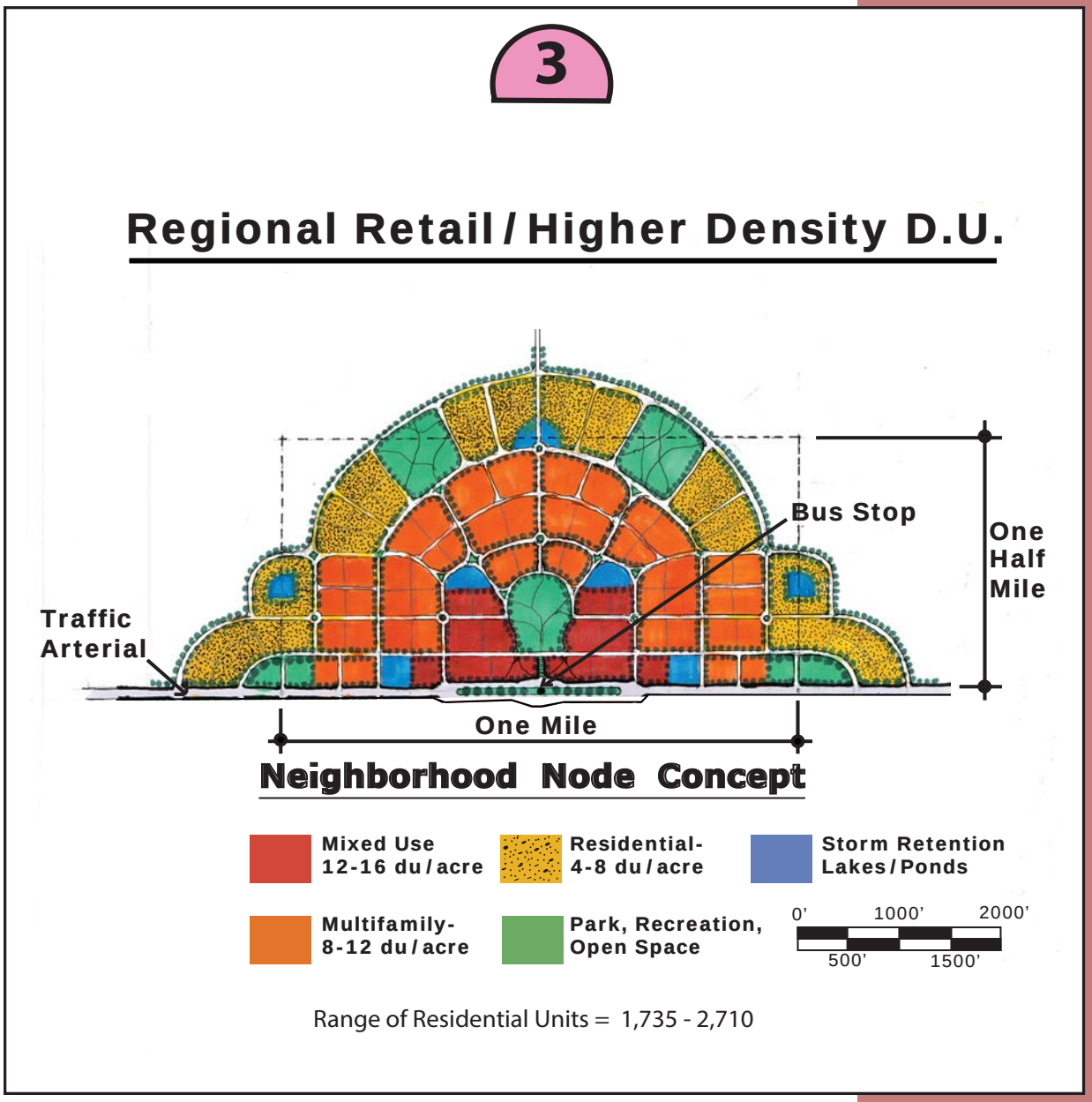


Figure 2-6: Neighborhood Node Concept #3



Range of Residential Units = 1,735 - 2,710

As suggested by the "Life Cycle Housing and Housing Densities" discussion in Volume 2, Chapter 3, opportunities for single-family houses are located at the outer perimeter of this node, with most of the core area populated by workforce apartments, senior assisted-living facilities, townhouses and condominiums. The density ranges between 4 to 16 dwelling units per acre. This commercial node serves a wider area than just the immediate neighborhood, drawing from a three to five mile radius from the central core of the node. This higher density node is located along a collector or arterial corridor. A bus stop is located in the heart of the node, connecting residents to employment and recreation centers in the rest of the region.

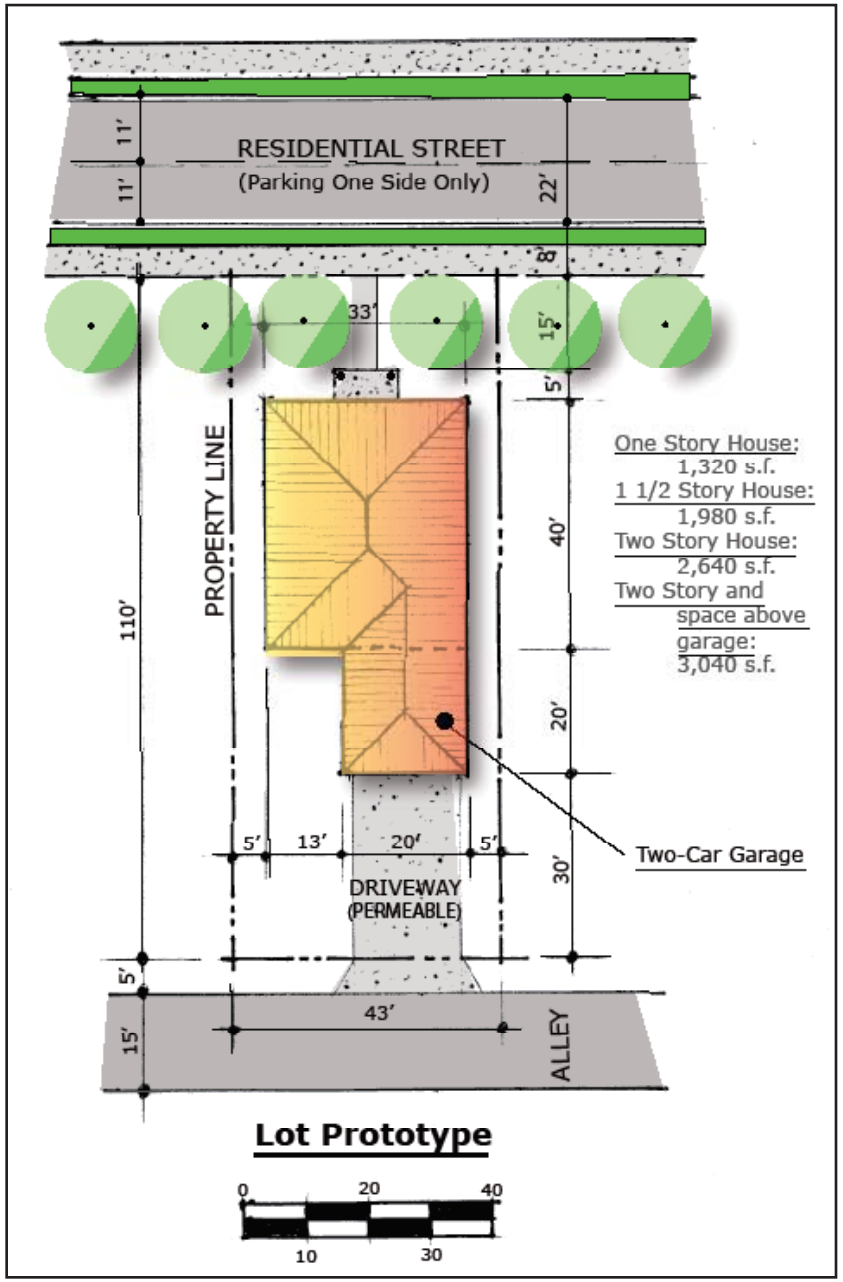
As mentioned, the **neighborhood** is the basic building block of a cohesive Regional Plan. Memorable neighborhoods have a center and distinct edges defining them. Residential single-family block sizes within the core of the neighborhood do not exceed a perimeter measure of approximately one-third of a mile. Figure 2-7 and Figure 2-8 illustrate a conceptual lot and block size for compact, walkable single family developments near the core of the neighborhood or at the outer edges. Single-family lots of 43' x 110', with a 15' alley behind them, can yield blocks of sixteen lots (eight per each of the two long block faces) and yield densities of 8.0 dwelling units per acre, not counting streets (net).

These smaller blocks make better, more walkable neighborhoods because the more blocks per square mile, the more choices pedestrians have to make interesting detours to coffee shops, drug stores or cleaners. The other reason that smaller blocks are better is that bigger blocks mean fewer streets and thus bigger, wider streets, which carry higher speeds, are more hazardous, and have more accidents. A city with twice the block sizes shown requires each street to hold twice as many driving lanes.

Neighborhoods in Philadelphia and San Francisco with walkable grids have blocks averaging less than four hundred feet in length on any given side. The new Institute of Traffic Engineers' manual called *Designing Walkable Urban Thoroughfares* recommends that neighborhood street lanes not exceed ten or eleven feet in width. [31]

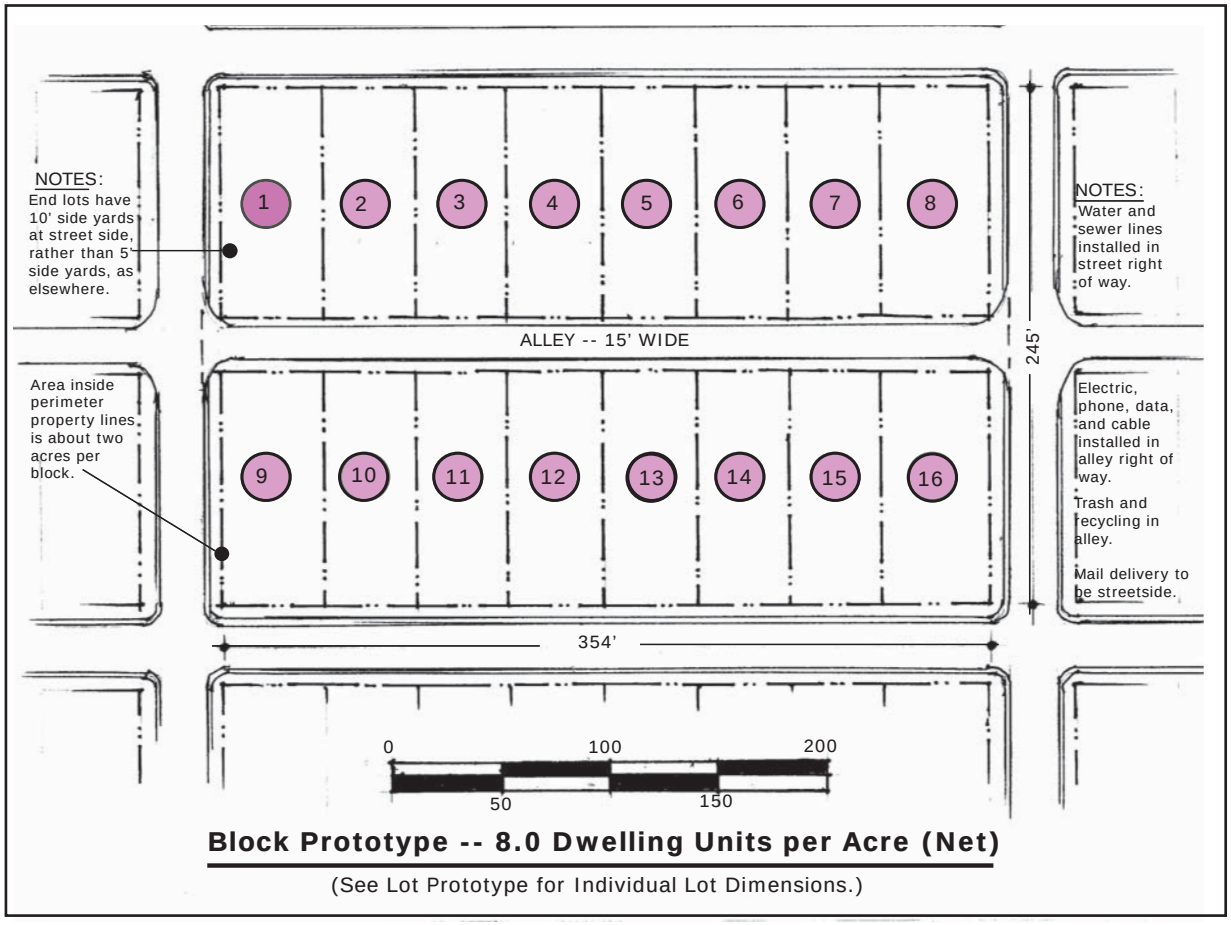
31 *Walkable City* by Jeff Speck, published by Farrar, Straus and Giroux of New York, 2012, pages 164-171.

Figure 2-7: Lot Prototype



The Lot Prototype and Block Prototype diagrams illustrate the fact that single-family residential development can easily achieve densities up to eight dwelling units per acre. The block size is designed for ease of pedestrian usage and neighborhood flexibility for biking and walking destinations. Narrow lanes help calm traffic speed and make for more cautious driving. Parking can occur on one side of the street, and with alleys and rear garages, the on-street parking is mostly utilized by visitors to the neighborhood. It is assumed that the lane on the other side of the street, opposite the parking side, can provide a "sharrow" lane, or shared bike lane. The diagrams document the concept of building single family housing in neighborhood nodes in areas labeled "0 - 4" and "4 – 8" dwelling units per acre.

Figure 2-8: Block Prototype



RECOMMENDATION: *In areas where compact development using 1/8 acre lots is desired, specify the following standards for block sizes:*

- *Block shall have an average length not exceeding 400 feet.*

Utilization and Upgrading of Existing Infrastructure

The utility maps shown in Volume 1, Chapter 3 indicate areas served by existing infrastructure, including sanitary sewer and potable water. The priority locations for infilling with compact development are in those areas already served by utilities and infrastructure (also including streets, roads, and sidewalks that are in close proximity or capable of being extended). Development Nodes, forming complete neighborhoods, or assisting in completing previously existing neighborhoods, are first located within the existing infrastructure shed, wherever possible. Census tracts that are (1) close to or within the infrastructure shed; and (2) have the most infill land available, are of the highest priority for development. Larger tracts of land enable mixed use and multifamily projects to be developed. The mixed use and multifamily projects are conducive to compact and efficient land use.

RECOMMENDATION: *Prioritize land use in three counties through streamlined processing and approval of development proposals that fill up vacant land and utilize existing infrastructure.*

Revitalization Nodes

The Neighborhood Node concept can be applied in urban neighborhoods to revitalize sectors that have undergone disinvestment or in areas where there is already some level of resurgence underway. Urban neighborhoods with infrastructure, schools, churches, parks, and other urban amenities, often need only a smattering of reinvestment to trigger a renaissance of neighborhood pride and activity. The Neighborhood Node diagram can be adapted to previously developed areas using an "infill" strategy, providing sorely needed items such as apartments, town houses or tot-lots. The Neighborhood Node application to the Lodge Elementary (K-8) School's neighborhood in Volume 2, Chapter 3, page 83, shows how the concept can be adapted and re-adapted to fill out the checklist of neighborhood requirements.

Growth Nodes

Growth Nodes are generally considered to be those "greenfield" nodes, built from scratch in areas that have accessible infrastructure available or presently serving the overall site. These nodes have the potential of being purer interpretations of the Neighborhood Node Concept, which is to say they have the potential for clearly delineated centers, edges, proximate parks, centralized bus stops and other amenities that can form true residential, mixed use neighborhoods. These Growth Nodes should have trails and bikeways designed to interconnect throughout. They should be conceived as multi-modal, green communities.

Indicators

Performance measures are designed to evaluate the success of this Regional Plan at meeting the vision and goals of Henderson, Vanderburgh, and Warrick counties. The measures track progress compared to an initial benchmark. These performance measures are data-driven and several could be calculated by EMPO to check progress towards the vision and goals.

The Office of Sustainable Housing and Communities of the US Department of Housing and Urban Development produced a document guiding the development of these performance measures entitled "Guidance on Performance Measurement and Flagship Sustainability Indicator Fact Sheets." This document presents three major objectives of performance measurement:

1. **To capture data that can be used to demonstrate the impact of the Sustainable Communities Initiative, and to answer questions regarding best practices and lessons learned;**
2. **To begin to develop a common framework across the country for the measurement of progress toward making our communities more sustainable; and**
3. **To empower individual communities to track progress toward their individual sustainability goals.**

The performance measures were designed to utilize the existing data for Henderson, Vanderburgh, and Warrick counties. The technical committees were involved in the development of the performance measures. During the development process, many of the flagship sustainability indicators were adopted as performance measures such as total percent of workers commuting via walking, biking, transit, or ridershare and housing plus transportation cost affordability.
In addition to using the technical committees in the development of the performance measures, the Office of Sustainable Housing and Communities Performance Measures Technical Assistance Team conducted remote assistance. The team developed a Performance Management Plan that identifies solutions to the priority issues. This plan also assists in achieving complete reporting, strengthening the regional performance measurement, and demonstrating the impacts of grant funding.

The performance measures identified will provide a quantitative method of charting the physical development of Henderson, Vanderburgh, and Warrick counties through the year 2040. These measures are presented in the SEAC report entitled "Sustainability Today" and give a present day baseline condition for the region. These measures are grouped into the following categories:

- **Transportation and Infrastructure**
- **Housing Affordability**
- **Economic Development**
- **Arts and Culture**
- **Environment, Ecological Footprint, and Carbon Footprint**
- **Land Use Development**

Careful attention was paid during the development of the performance measures with regard to the regular monitoring and updating of these measures to chart progress in meeting the vision and goals of the Regional Plan. The EMPO travel demand model and US Census information can provide much of the data needed to track these performance measures over the coming years.

Figure 2-9: Performance Measures

Transportation and Infrastructure

Performance Measures	2010 Baseline Data: Henderson County	Vanderburgh County	Warrick County	Source
Average Commute Time to Work	20.6 minutes	18.4 minutes	22.8 minutes	2010 U.S. Census Bureau
% of Workers Commuting by Walk, Bike, Transit, and Car	95.95% auto; 0.44% bus; 1.10% walk	92.96% auto; 1.33% bus; 2.19% walk	96.03% auto; 0.11% bus; 0.82% walk	2011 U.S. Census Bureau
Transit System Ridership	137,658 passengers	2,051,501 passengers	16,649 passengers	2011 Ridership from HARTS, METS, WATS
Regional Walking Trips	5,900 walking trips (3.08% of total trips)	27,400 walking trips (3.60% of total trips)	6,000 walking trips (2.20% of total trips)	2010 EMPO travel demand model
Average Time to Retail Activities	13 min by auto; 56 min by bus; 49 min by walk	13 min by auto; 47 min by bus; 43 min by walk	18 min by auto; 59 min by walk; no bus service available in 2010.	2011 EMPO travel demand model

Housing Affordability

Performance Measures	2010 Baseline Data: Henderson County	Vanderburgh County	Warrick County	Source
Housing + Transportation (H+T) Affordability	50% of Average Household Income Spent on H+T Costs	50% of Average Household Income Spent on H+T Cost	58% of Average Household Income Spent on H+T Cost	CNT and 2010 U.S. Census Bureau
Vacancy Rates - Home Owner	1.1% Vacancy Rate	2.0% Vacancy Rate	2.9% Vacancy Rate	2010 U.S. Census Bureau
Vacancy Rates - Renter	7.8% Vacancy Rate	7.8% Vacancy Rate	12.0% Vacancy Rate	2010 U.S. Census Bureau
Home Value Appreciation	39% Appreciation from 2000 to 2010	38% Appreciation from 2000 to 2010	39% Appreciation from 2000 to 2010	2010 U.S. Census Bureau
% Rental Units Affordable to HH Earning 80% of Median Family Income		Total for All Counties 62.3%		2005 - 2009 American Community Survey
% Owner Units Affordable to HH Earning 80% of Median Family Income		Total for All Counties 19.3%		2005 - 2009 American Community Survey

Economic Development

Performance Measures	2010 Baseline Data: Henderson County	Vanderburgh County	Warrick County	Source
Number of Employment Activities within 20 Minute Commute	33,200 Jobs by Auto; 500 Jobs by Bus; 600 Jobs by Walk	113,000 Jobs by Auto; 4,700 Jobs by Bus; 2,500 Jobs by Walk	41,000 Jobs by Auto; 200 Jobs by Walk; No Bus Service in 2010	2010 EMPO Travel Demand Model
Diverse Growth by Industry Sector	14.9% Jobs in Growing Industries	21.3% Jobs in Growing Industries	20.4% Jobs in Growing Industries	2010 Bureau of Economic Analysis
Unemployment Rate	8.7% for 2011	7.8% for 2011	7.0% for 2011	2011 Bureau of Labor Statistics

Arts and Culture

Performance Measures	2010 Baseline Data: Henderson County	Vanderburgh County	Warrick County	Source
Average Time to Restaurants	10 min by auto; 30 min by bus; 26 min by walk	10 min by auto; 24 min by bus; 29 min by walk	14 min by auto; 36 min by walk; no bus service available in 2010.	2010 EMPO Travel Demand Model
Average Time to Recreational Activities	13 min by auto; 53 min by bus; 53 min by walk	14 min by auto; 41 min by bus; 43 min by walk	19 min by auto; 60 min by walk; no bus service available in 2010.	2010 EMPO Travel Demand Model
Average Time to Healthy Food Choices	9 min by auto; 45 min by bus; 43 min by walk	8 min by auto; 36 min by bus; 36 min by walk	9 min by auto; 48 min by walk; no bus service available in 2010.	2010 EMPO Travel Demand Model
Income Diversity	69% of Neighborhoods Have Healthy Income Diversity	58% of Neighborhoods Have Healthy Income Diversity	63% of Neighborhoods Have Healthy Income Diversity	2010 EMPO Travel Demand Model
Health Impacts from Bicycle Trails and Sidewalks	68% Adults Overweight or Obese	62% Adults Overweight or Obese	67% Adults Overweight or Obese	Welborn Baptist Foundation 2008

Environment, Ecological Footprint, Carbon Footprint

Performance Measures	2010 Baseline Data: Henderson County	Vanderburgh County	Warrick County	Source
Air Quality	1,400 Tons per Day of GHG Emissions	2,960 Tons per Day of GHG Emissions	1,370 Tons per Day of GHG Emissions	2010 EMPO Travel Demand Model
Recycling	110 Tons per Year - Scrap Metal Only	3,168 Tons per Year - Curbside and Drop Off	Incomplete Data for Warrick County	2011 Totals Provided by the County
Energy Consumption (Average Monthly Electric Bill)	Avg. Monthly Energy Bill is $65.96	Avg. Monthly Energy Bill is $160.58	Avg. Monthly Energy Bill is $160.58	US Energy Administration, Vectren, HMPL

Land Use Development

Performance Measures	2010 Baseline Data: Henderson County	Vanderburgh County	Warrick County	Source
Land Consumption	1,230 People per Square Mile	2,912 People per Square Mile	1,553 People per Square Mile	National Land Cover Data & U.S. Census
Diversity of Land Uses	44% of Neighborhoods have Healthy Diversity	42% of Neighborhoods have Healthy Diversity	58% of Neighborhoods have Healthy Diversity	2010 EMPO Travel Demand Model

Chapter 3 - Millennial Plan for Growth & Revitalization

"You don't need a weatherman to tell which way the wind blows."
- Bob Dylan

"A man who senses the winds of change should build not a wall but a windmill."
- Chinese Proverb

Regional Collaboration: Planning and Implementing at the Regional Level

The Regional Plan for Sustainable Development is the product of collaboration across the county lines of Vanderburgh and Warrick counties in Indiana, and across the Ohio River to Henderson County, Kentucky. Planning, viewing issues and opportunities, and implementing programs at a regional level requires working **networks** that evaluate problems and challenges with the good of the region and its population in mind. Rather than a competitive attitude, a collaborative approach places resources and experience where they are needed most. Foundations begin to look for common ground instead of staking out their own turf. Funding and raising capital becomes a joint venture, where pooling of the best characteristics of each member of the network strengthens grant applications and federal funding requests. A Regional Roundtable composed of foundation heads, corporate and political leaders, not-for-profit directors, university researchers, economic development experts and educational advisors could become the overarching steward of regional planning, regional thinking and collaborative action. This topic of a leadership network or networks will be revisited in Chapter 7.

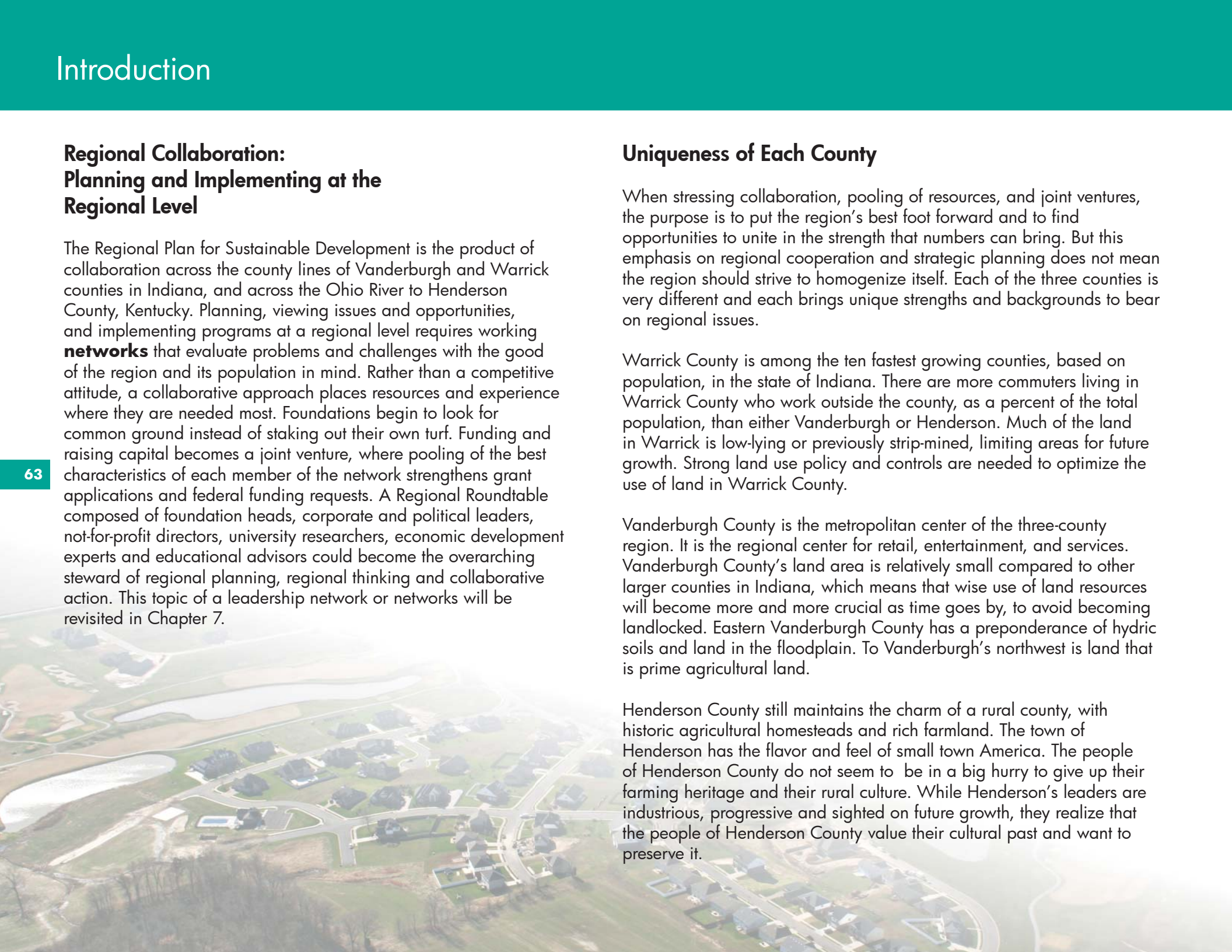
Uniqueness of Each County

When stressing collaboration, pooling of resources, and joint ventures, the purpose is to put the region's best foot forward and to find opportunities to unite in the strength that numbers can bring. But this emphasis on regional cooperation and strategic planning does not mean the region should strive to homogenize itself. Each of the three counties is very different and each brings unique strengths and backgrounds to bear on regional issues.

Warrick County is among the ten fastest growing counties, based on population, in the state of Indiana. There are more commuters living in Warrick County who work outside the county, as a percent of the total population, than either Vanderburgh or Henderson. Much of the land in Warrick is low-lying or previously strip-mined, limiting areas for future growth. Strong land use policy and controls are needed to optimize the use of land in Warrick County.

Vanderburgh County is the metropolitan center of the three-county region. It is the regional center for retail, entertainment, and services. Vanderburgh County's land area is relatively small compared to other larger counties in Indiana, which means that wise use of land resources will become more and more crucial as time goes by, to avoid becoming landlocked. Eastern Vanderburgh County has a preponderance of hydric soils and land in the floodplain. To Vanderburgh's northwest is land that is prime agricultural land.

Henderson County still maintains the charm of a rural county, with historic agricultural homesteads and rich farmland. The town of Henderson has the flavor and feel of small town America. The people of Henderson County do not seem to be in a big hurry to give up their farming heritage and their rural culture. While Henderson's leaders are industrious, progressive and sighted on future growth, they realize that the people of Henderson County value their cultural past and want to preserve it.



Regional Retail and Medical Services

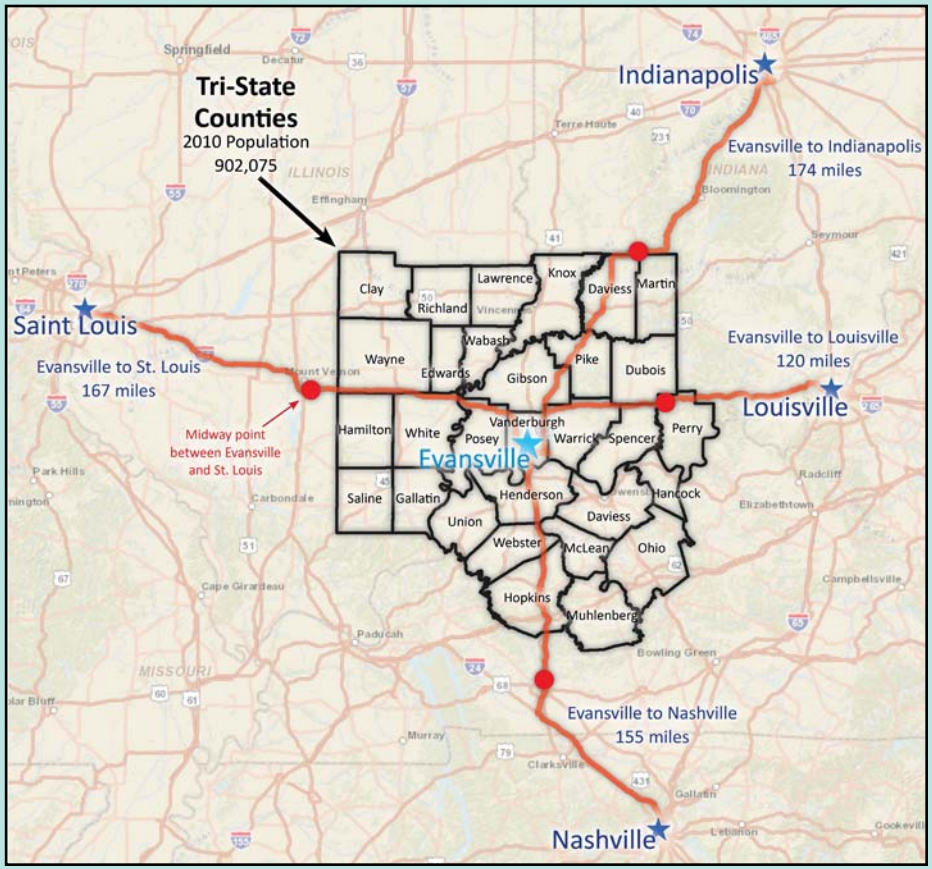
The Regional Map (Figure 3-1) shows the strategic position of the three-county area relative to other metropolitan areas in four states. The Evansville Metropolitan Area is located virtually equidistant from Louisville, Kentucky; Nashville, Tennessee; and St. Louis, Missouri – all within three hours driving time or less. Indianapolis, Indiana to the north is presently just slightly more than three hours by automobile, but with the anticipated completion of the last two phases of Interstate 69 from Bloomington to Indianapolis, Indianapolis will be within three hours of drive time from Evansville.

The strategic location of the metropolitan area along the banks of the Ohio River, as explained in Volume 1, Chapter 3, makes the Evansville metropolitan area a regional center for a wide range of services to residents of three states: southwestern Indiana, northwestern Kentucky, and southeastern Illinois. Services such as, most notably, retail shopping, entertainment, culinary dining, and medical services and procedures, are provided by multiple shopping districts and healthcare providers in the region.

Land Conservation in the Three-County Area

The three counties of Vanderburgh, Warrick and Henderson, have compelling, but very different reasons for conserving undeveloped land. Vanderburgh County is the location of the City of Evansville, the third largest city in Indiana. The metropolitan area is located in a county that is smaller, geographically, than its surrounding contiguous counties, as well as most of the rest of the counties in the State of Indiana. Henderson is a rural county with an agricultural heritage. Rural farmland and homesteads are important aspects of the culture and economic base of Henderson County. Warrick County, while growing steadily, has limitations on buildable land due to low-lying flood-prone areas, as well as areas that have been strip-mined in the past. The strip-mined land has limitations for new housing or commercial buildings due to mine subsidence and soil bearing issues.

Figure 3-1: Tri-State Area Map



Geologic and Seismic Context - New Madrid Fault

As indicated on the Seismic Map, the region falls within a potential earthquake zone caused by proximity to the New Madrid Fault. Seismic events have been recorded at locations throughout the fault zone, resulting in the area being classified, in the International Building Code, as a high risk seismic area with potentially significant earthquake induced ground motion. The special requirements for structural connections and braced frames for this region are more rigorous than in many other parts of the country.

Seismic design for buildings, bridges and industrial structures is calculated to minimize property damage and to save lives. But the effects of seismic events become more severe and are geometrically compounded as the numerical figures on the Richter scale increase arithmetically. After a certain point on the Richter scale has been reached, in excess of approximately seven (7), the property damage, level of injury, and potential loss of life becomes staggering.

Figure 3-2: New Madrid Fault Zone

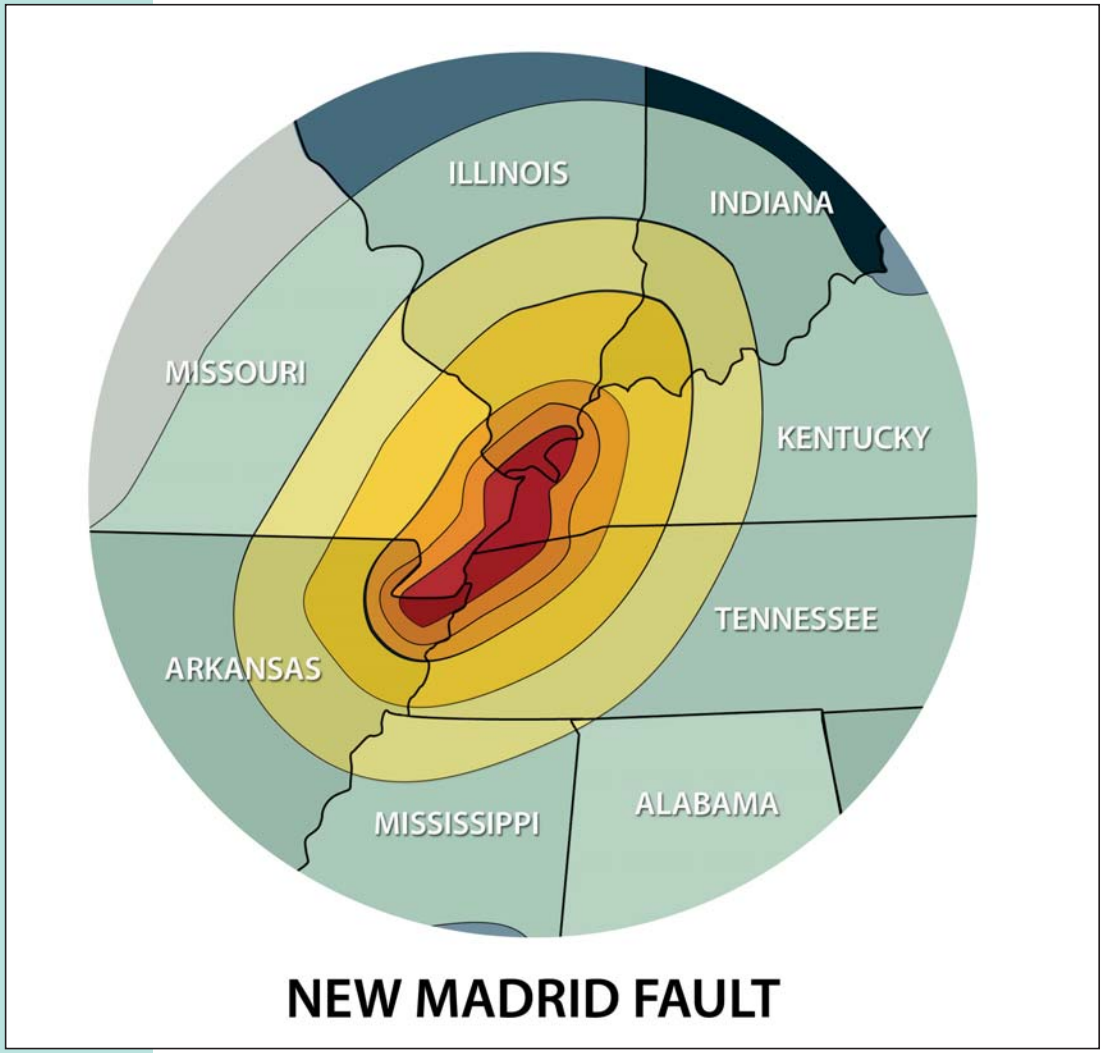
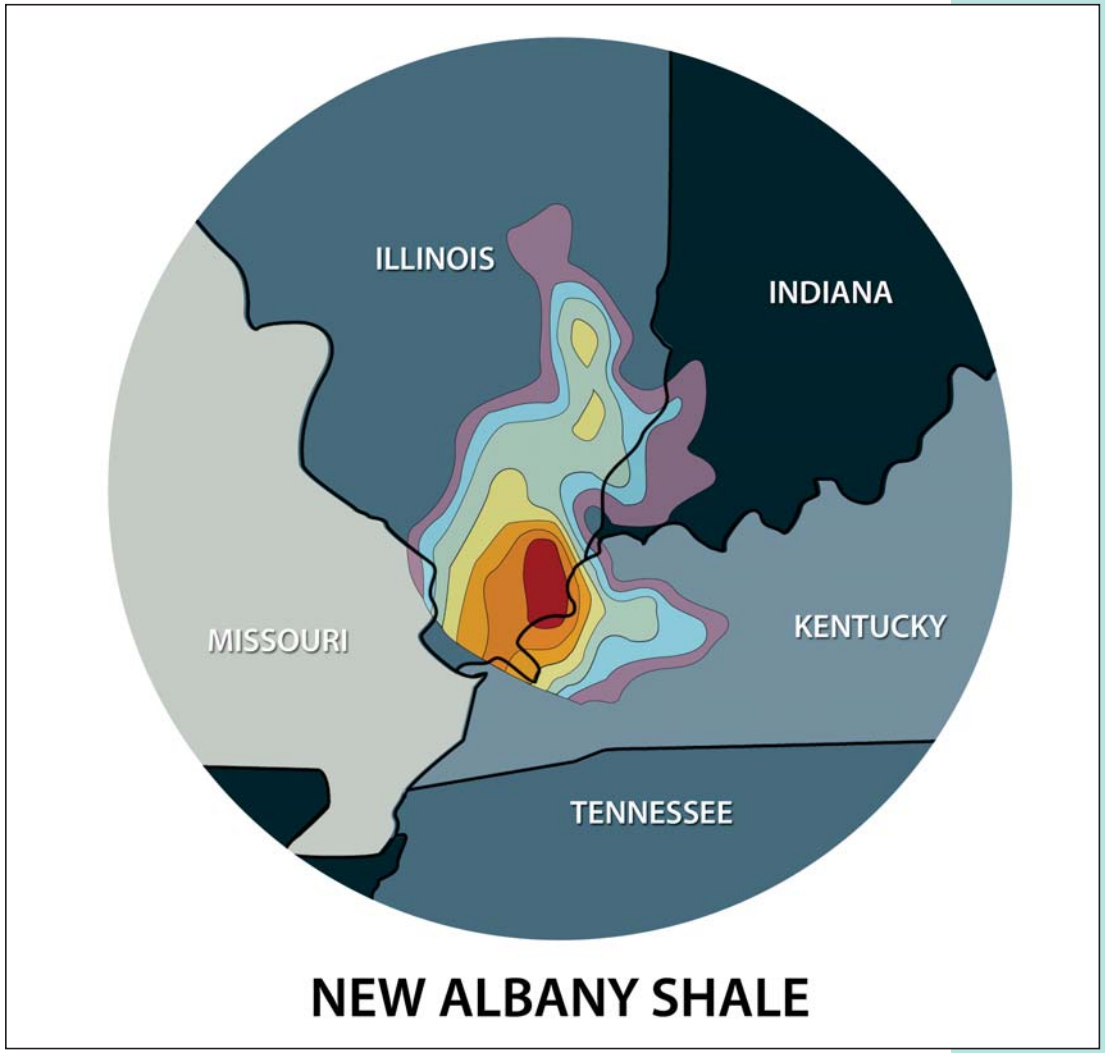


Figure 3-3: New Albany Shale Area



Soil and Rock Strata - New Albany Shale

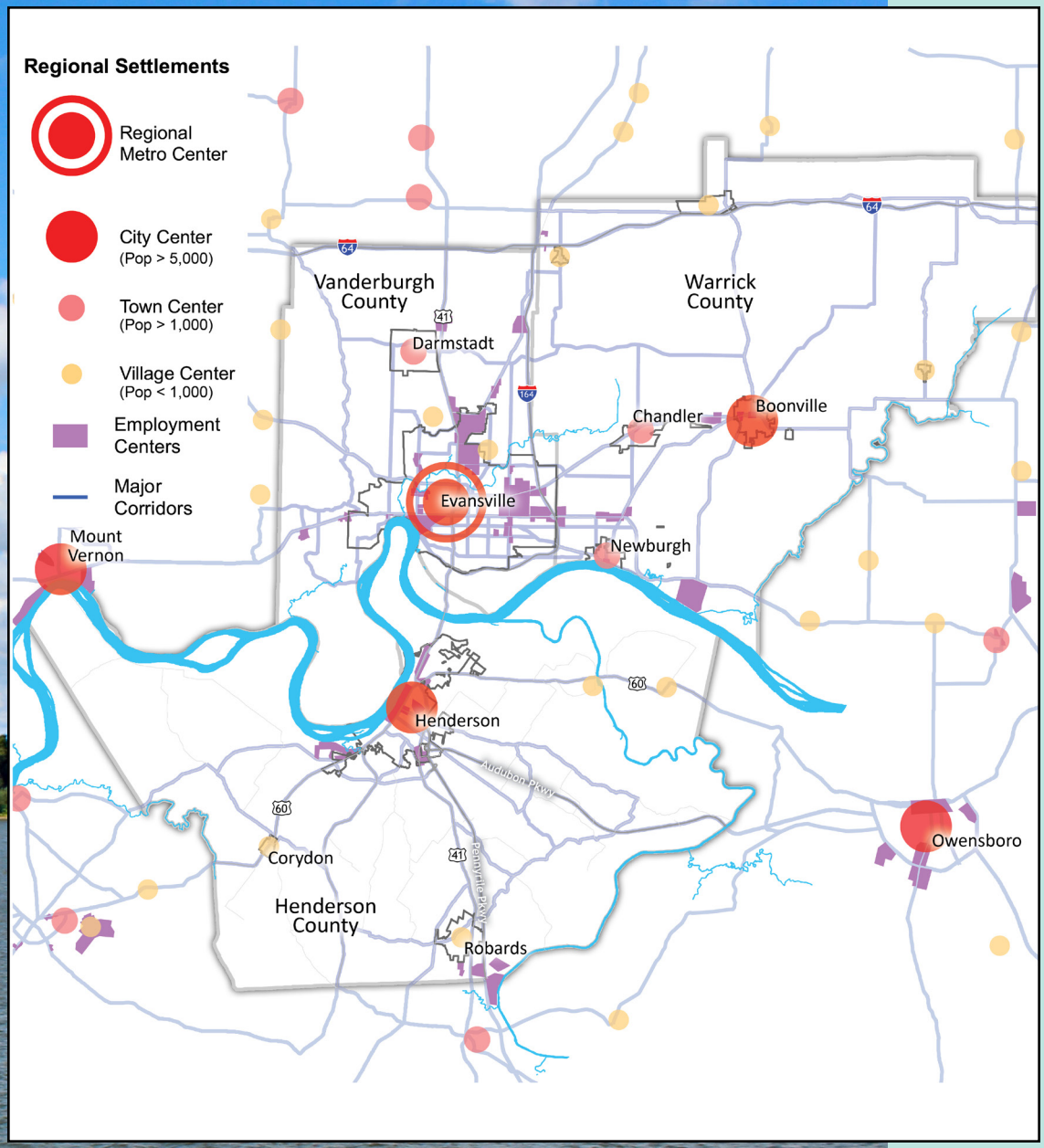
According to the Illinois Basin Consortium, which is comprised of the Illinois, Indiana and Kentucky Geologic Surveys and the Gas Research Institute, the New Albany Shale area in the Tri-State region covers some 53,000 square miles and is estimated to contain 86 trillion cubic feet (Tcf) of natural gas. Gas has already been produced from the New Albany Shale region since 1858, from at least 40 different fields in Kentucky, 19 in Indiana, and 1 in Illinois (as of 2005 data). Referencing 2005 records, more than 600 wells have been drilled in the New Albany Shale basin, the majority in southern Indiana and western Kentucky. The map shows what is called the Illinois Basin, which encompasses all three states. The Illinois Basin remains largely undeveloped due to poorly constructed and maintained pipeline infrastructure and, until recently, public policy that permitted significant gas production data to remain shielded from public viewing.

Changes in public policy and higher gas prices have spurred a renewed interest in shale development through the fracturing of shale layers ("fracking"). Until the present time, Illinois has had no substantial regulations relative to fracking. Legislation is now pending in Illinois, with new rules that require private companies to test groundwater before, during and after drilling. Companies will be held liable if any contamination is discovered after drilling begins. The New Albany Shale region in Southern Illinois is expected to be active in fracking by oil and gas companies in 2014, fracking at some 5,000 feet below the surface. It will remain for each of the three states, Illinois, Kentucky and Indiana, and their state environmental agencies to regulate “fracking” to protect ground water.

Importance of the Ohio River

French settlers, sensing the romance of the river, called the Ohio River *La Belle Riviere;* Native Americans called it *Oyo,* which means "the great river." Thomas Jefferson is reported to have said that it was "the most beautiful river on earth." Regardless of names or descriptions, the Ohio River is still the common focal point to urban centers in Vanderburgh, Henderson and Warrick counties. In downtown Evansville, downtown Henderson, and along Water Street in Newburgh, the Ohio River has been a powerful force in shaping the identity, history, and visual character of all three downtowns. In addition to its aesthetic beauty and scenic attributes, the Ohio River is a major transportation artery. As oil prices continue to rise, river trade and traffic may become even more important than ever. Author James Howard Kunstler, who wrote *The Geography of Nowhere: The Rise and Decline of America's Man-Made Landscape*, predicts the decline of any community that is not near a waterway. He believes that cities, once gasoline prices hit $10 or more per gallon (and he is sure they will), will return, in their development patterns, to "dense villages." These villages, Kunstler believes, will have to produce their own food, goods and services hyper-locally. Whether this version of the future prevails or not, the Ohio River will remain an asset aesthetically, socially and economically.

Figure 3-4: Regional Settlements



Top Tier Towns

Another urbanist, Demetri Baches, urban planner and thought leader, calls towns and smaller metropolitan areas with populations between ten thousand and three hundred thousand "Top Tier Towns." Baches' vision suggests that these "Top Tier Towns," in the future, can offer the best of both worlds: a high quality of life and an urbane and connected lifestyle, within a locally grounded environment that is "easy to get one's arms around." In the future, when fuel prices rise and long distance commutes become economically prohibitive, locations that have negotiable travel networks that allow travelers to get anywhere within the region in less than a half hour, will be the optimum settlements. [1] This type of independent, self-sustaining, compact and resource-saving neighborhood and community development is what the Millennial Plan for 2040 is all about.

1 *The End of the Suburbs*, by Leigh Gallagher, Portfolio/Penguin, Published by the Penguin Group [USA] Inc., New York, NY, 2013

The Infill Strategy

For the Millennial Plans that follow, the definition of **"infill" is the strategy of developing underutilized, undeveloped, and vacant properties in urbanized areas, before continuing development on undeveloped land outside the city**. In some of the urbanized areas in the region, industries have abandoned the urban core and relocated outside urbanized areas in favor of suburban locations. This abandonment of the incorporated parts of cities has left empty buildings that deteriorate over time. At the urban fringe, land is sometimes cheaper, development approvals can be more streamlined, and brownfields (contaminated land) are not a concern. When jobs and people leave the city, gaps in land development occur. The gaps that occur over time can also become gradually blighted. These urban gaps can also take root in suburban locations where "leapfrogging" has occurred. The following graph (Figure 3-5) compares the percentage of infill in the Evansville metropolitan area to other areas in the Midwest. For the period 2000-2009 only 6.4 percent of development in this SMSA was infill development. That level places the area near the bottom.

Communities across America are finding that they cannot keep up with the costs of stretching infrastructure to far reaches of the suburbs. Inefficient land use patterns can have a pronounced negative financial impact for governments, businesses and individuals. [2]

2 *Building Livable Communities*, by Center for Livable Communities (CLC), 2001

Figure 3-5: Infill Percentages of Midwest Communities

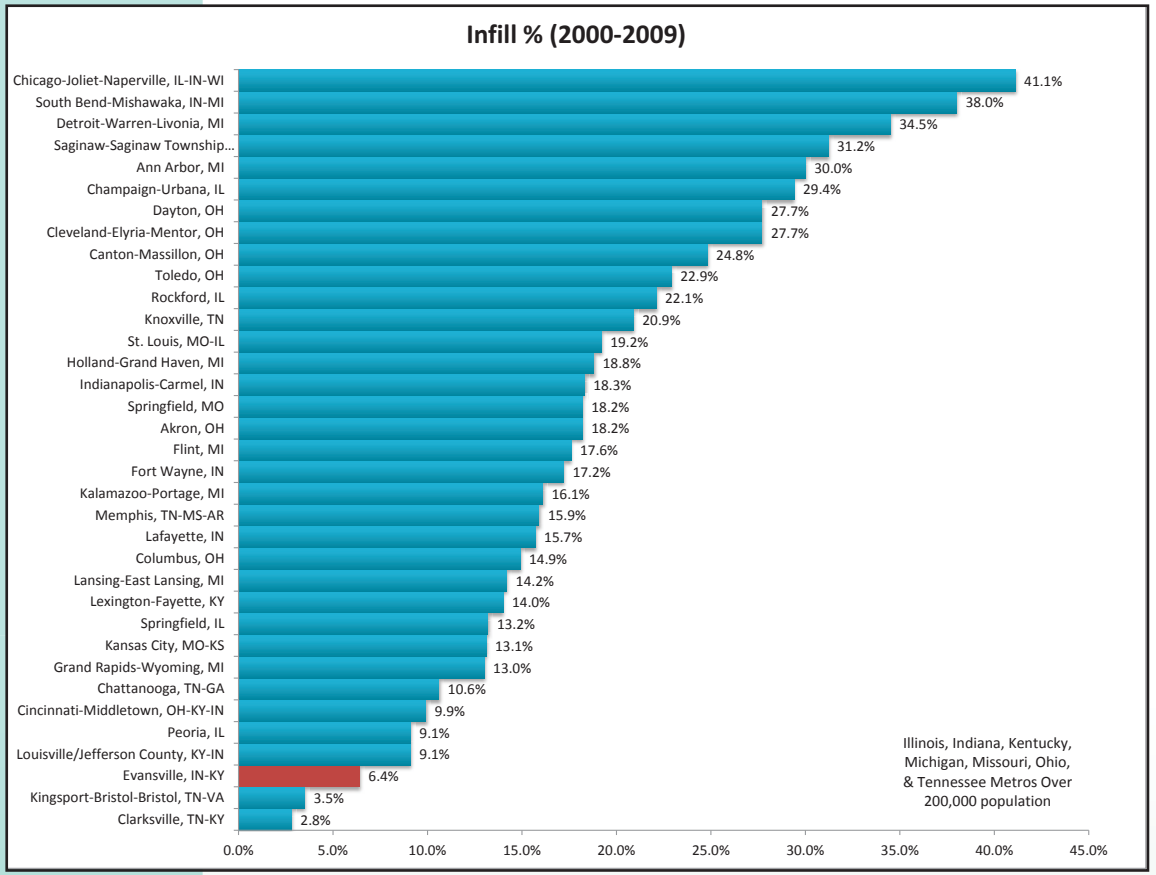
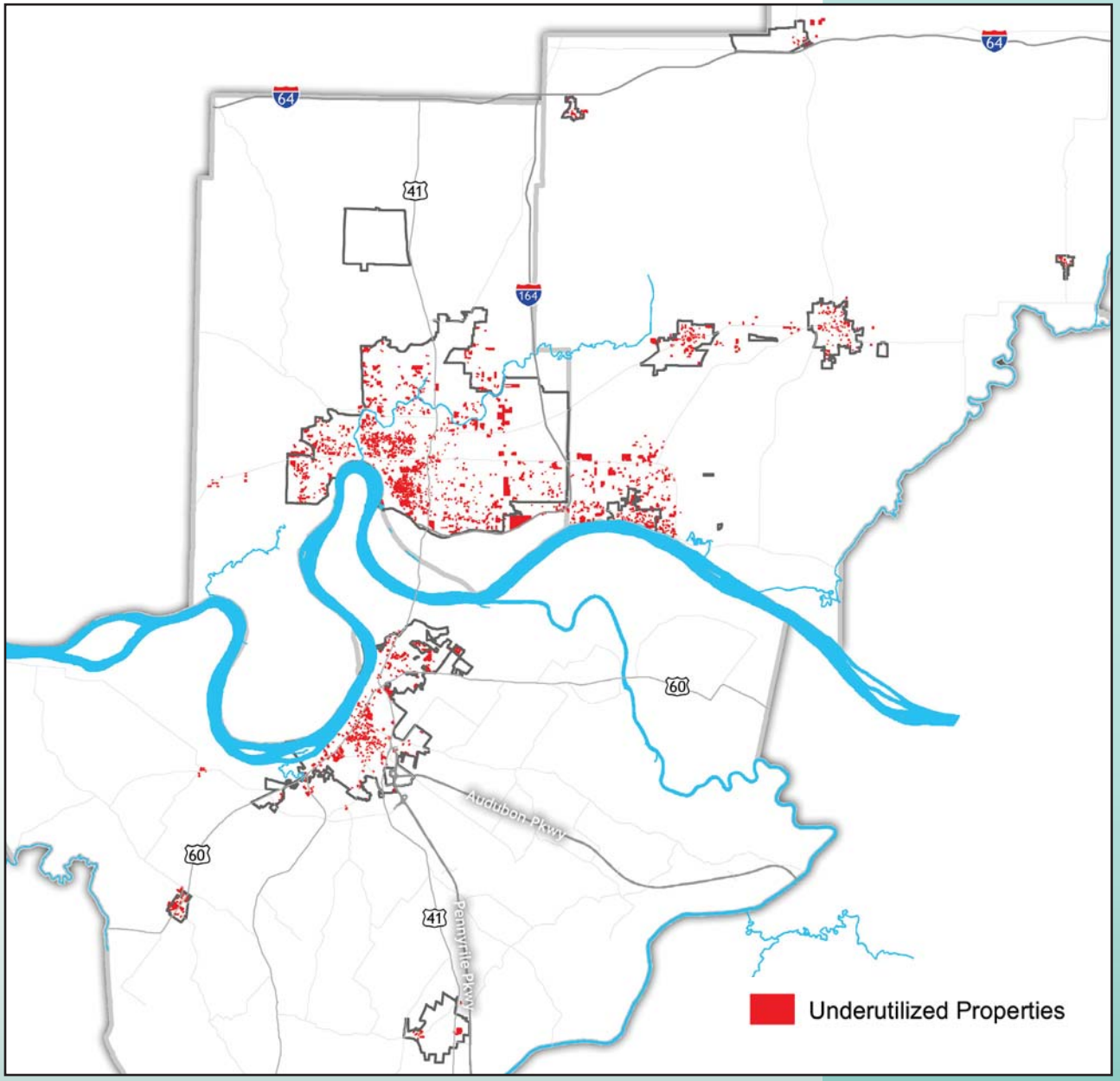


Figure 3-6: Underutilized Properties

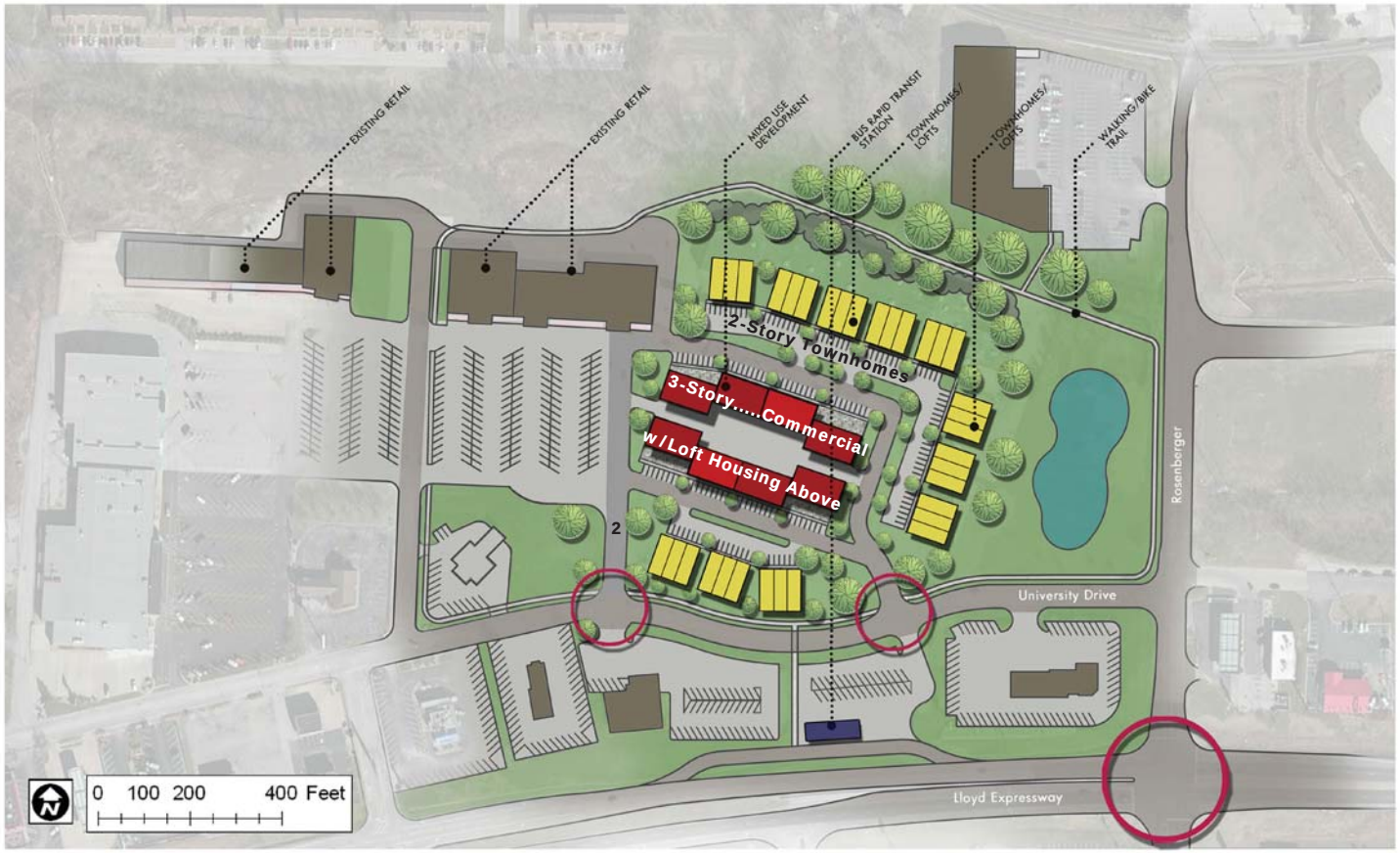


Underutilized Properties

Figure 3-6 illustrates the vast inventory of underutilized real estate in the three-county area. This underutilized real estate is the raw material of an infill strategy that seeks to optimize public investment.

As a strategy for growth and revitalization, infill offers an alternative to continual horizontal expansion of the metropolitan area. As an affordable housing strategy, infill offers redevelopment potential, as well as opportunities for creative design solutions. The 1995 report entitled *Beyond Sprawl*, produced by the Bank of America and the Low Income Housing Fund, makes the point that the costs of housing future generations through the sprawl strategy is "potentially crippling" to both government and society as a whole. [3] As an environment and green infrastructure strategy, infill provides for growth while conserving agricultural or other sensitive land areas, and contributing to energy savings. As a redevelopment strategy, infill is capable of enhancing the vitality, diversity and prosperity of existing cities, pumping life into vacated or blighted segments of urbanized areas.

Figure 3-7: Old Walmart - West Side Site



3 *Building Livable Communities*, by Center for Livable Communities (CLC), 2001, pp. 1-5

All across the US, numerous cities, suburbs, and even some rural neighborhoods are going through dramatic transformations. "Greyfields" such as parking lots, underused retail and commercial properties, and former industry sites are being "infilled" with apartments, townhomes, condos, and small-lot homes. The use of residential infill, building new homes in previously built-up areas, can assist communities in expanding housing choices, enlivening neighborhoods, filling public coffers, reducing infrastructure costs, all while safeguarding rural landscapes and protecting our natural resources. The following diagram (Figure 3-8) is an example of prototypical "greyfield" redevelopment, infilling unused suburban parking lots with neighborhood housing and green space.

Figure 3-8: Washington Square Development

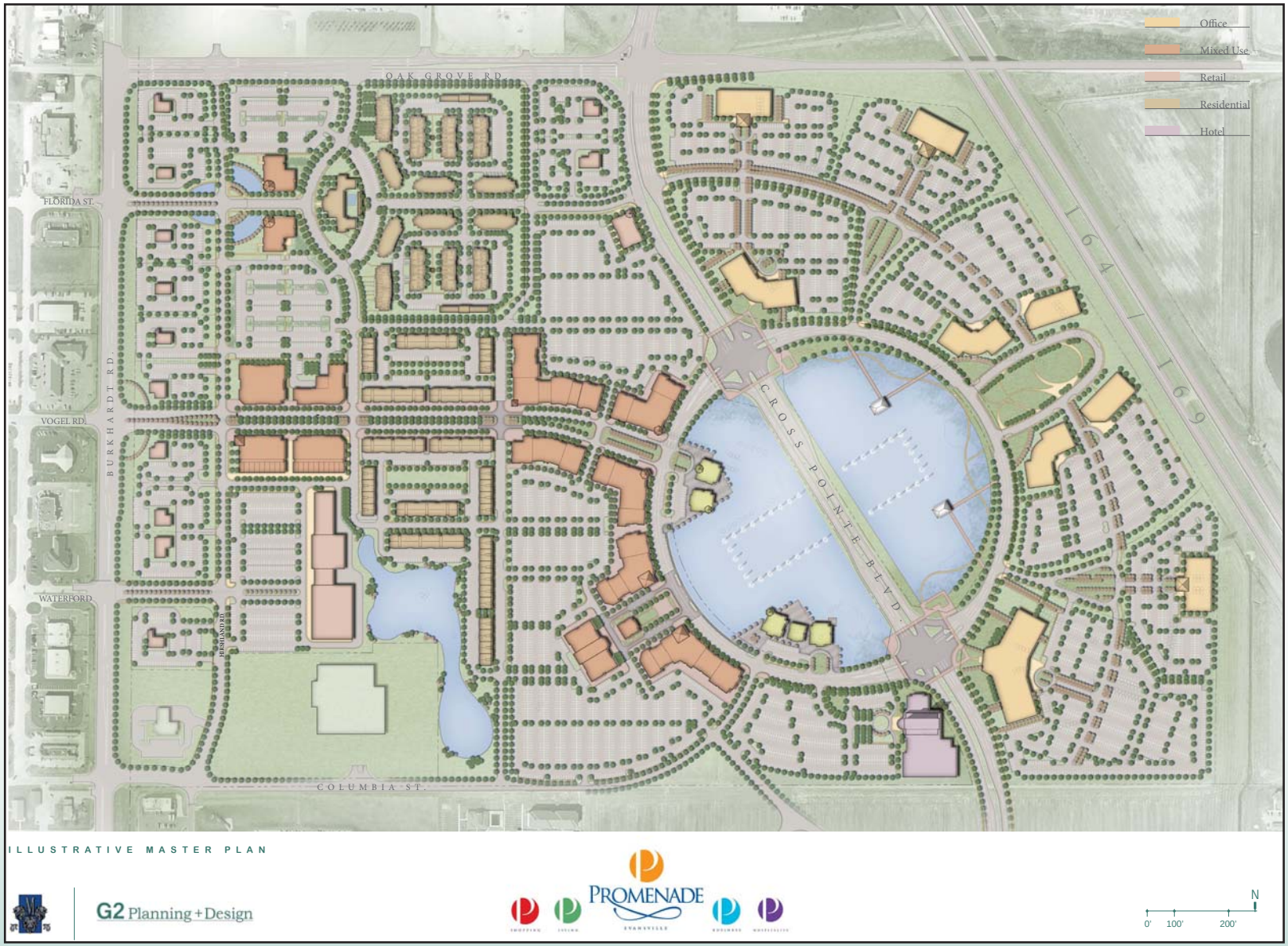
WASHINGTON SQUARE DEVELOPMENT PHASE ONE

Mixed Use

Mixed Use Development

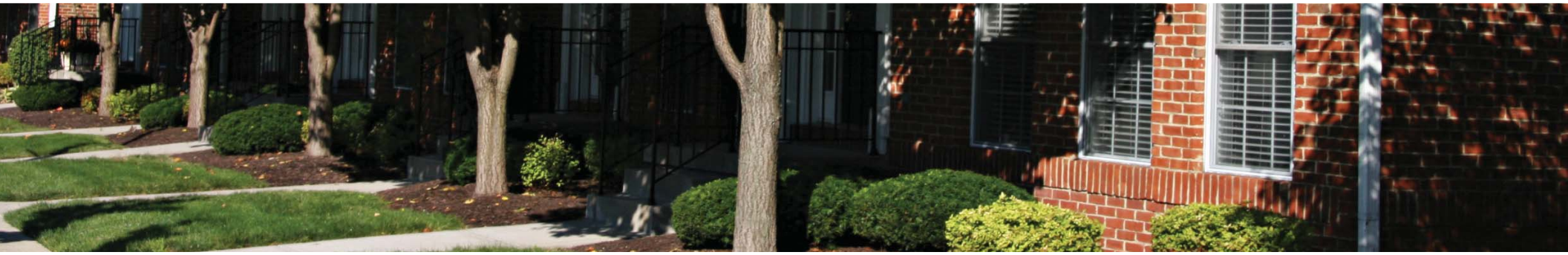
The zoning ordinances in the three counties make it difficult to mix land uses. It has been difficult for developers to build retail centers with housing or offices integrated into the fabric of the development. Mixed use development can enliven the public streetscape and provide activity around the clock. Neighborhoods become walkable when residents can get to convenience shopping or specialty shops within a short, safe walking distance. Using the previously discussed "infill strategy" along with creative planned development strategies on multi-acre sites, is a proven method that can create memorable neighborhoods that display a "sense of place." The Master Plan for the development of the Promenade on Evansville's eastside is a good example of infill development, development within the city limits and within the bounds of the existing street network. The Promenade concept can potentially become a good example of "mixed use" development that combines shopping and residential spaces in a comfortable, neighborhood environment, as shown in Figure 3-9.

Figure 3-9: The Promenade



Courtesy of Hirsch-Martin Development, LLC and G2 Planning + Design

Housing Types and Densities



Life Cycle Housing and Housing Densities 2040

The distribution of housing forming the land use plan for the SEAC Regional Plan for Sustainable Development will occur along major development corridors, within and around "nodes" at densities ranging, on average, between 4 – 16 dwelling units per acre (du/ac). The housing types can be tied to age cohorts and income levels, distributing population as projected in the variety of neighborhoods and housing types shown below:

Single-Family homes (Mostly owner-occupied – age 25-44)
1. Young families with children needing yards – white-collar
2. Baby Boomers still in the workforce
3. 0 - 4 du/ac (mostly on quarter acre lots or larger)

Affordable workforce housing (Owner-occupied – age 25-44)
1. Some single-parent families or couples with children
2. Single, working individuals
3. Single-family zero lot line houses, near employment centers
4. 4 - 8 du/ac (between 1/8 acre and 1/4 acre lots)

Workforce low-income apartments (Rental – age 20-34)
1. Students and/or unmarried service workers
2. Hourly wage technicians, blue-collar workers
3. Vocational technical grads
4. 12 - 16 du/ac

Apartments and townhouses or loft apartments (Rental – age 20-34)
1. Young singles and young married couples with no children – creative class
2. Yuppies (young, urban professionals) – white-collar
3. Relatively near employment, in mixed-use developments or downtown
4. 12 - 16 du/ac

Townhouses/condos/cottages/villas (Rental or owner-occupied – age 35-64)
1. Older Empty Nesters
2. Early retirees
3. Shuttle bus service to shopping and entertainment
4. Near higher education or cultural centers (museums, art galleries, theatres)
5. Seasoned professionals, creative class, hi-tech workers, professors
6. 8 -12 du/ac

Senior assisted-living (Mostly rental – age 65+)
1. Older seniors and frail elderly
2. Varying levels of care from meals only to acute medical care
3. 12 - 16 du/ac, depending on level of social and ancillary services

The approximate **average density** of residential development in the United States, ten years ago, in 2003, was 7.6 units per net acre. The densities in this RPSD report are assumed to be "net" densities. A net acre is an acre of developed land that does not include any streets, school sites, parks, open space, or other undevelopable land in the calculation. Due to changing demographics referred to previously, Chris Nelson of Virginia Tech University projects a significant change in market demand in the next ten to twelve years. Nelson thinks that densities of new and redeveloped housing, based on lifestyle preferences, will average about 13 units per acre, which is typical for townhouses. Single-family cottages and villas lower the average density calculation. So by 2025, the blended average, according to Mr. Nelson, on a national basis, will be approximately **nine units per net acre**. [5]

Encouraging more multifamily housing, in the **10 to 20 dwelling units per acre range**, in the core of our neighborhoods has been shown to be the most effective strategy for forming safer, more walkable neighborhoods. To quote Jeff Speck in *Walkable City*, (previously cited):

"Back in 1991, the Sierra Club's John Holtzclaw studied travel habits in twenty-eight California communities of widely varying residential density. He found, as expected, an inverse relationship between urbanity and driving miles. But, perhaps not expected, he also found his data points distributed around a pretty sharp curve, with most of the gains in efficiency occurring early on. Increasing housing density at the suburban end of the scale had a much greater impact than at the urban end, such that the vast majority of the driving reduction occurred in the switch from large-lot sprawl to densities of **10 to 20 units per acre**. These densities represent a traditional urbanism of apartments, row houses, and (even) some freestanding single-family homes. In contrast, the further concentration of households at higher densities – even above one hundred per acre—while helpful, produced less dramatic results."

5 A.C. Nelson. "Leadership in a New Era." Journal of the American Planning Association, Vol. 72, Issue 4, 2006, pp. 393-407

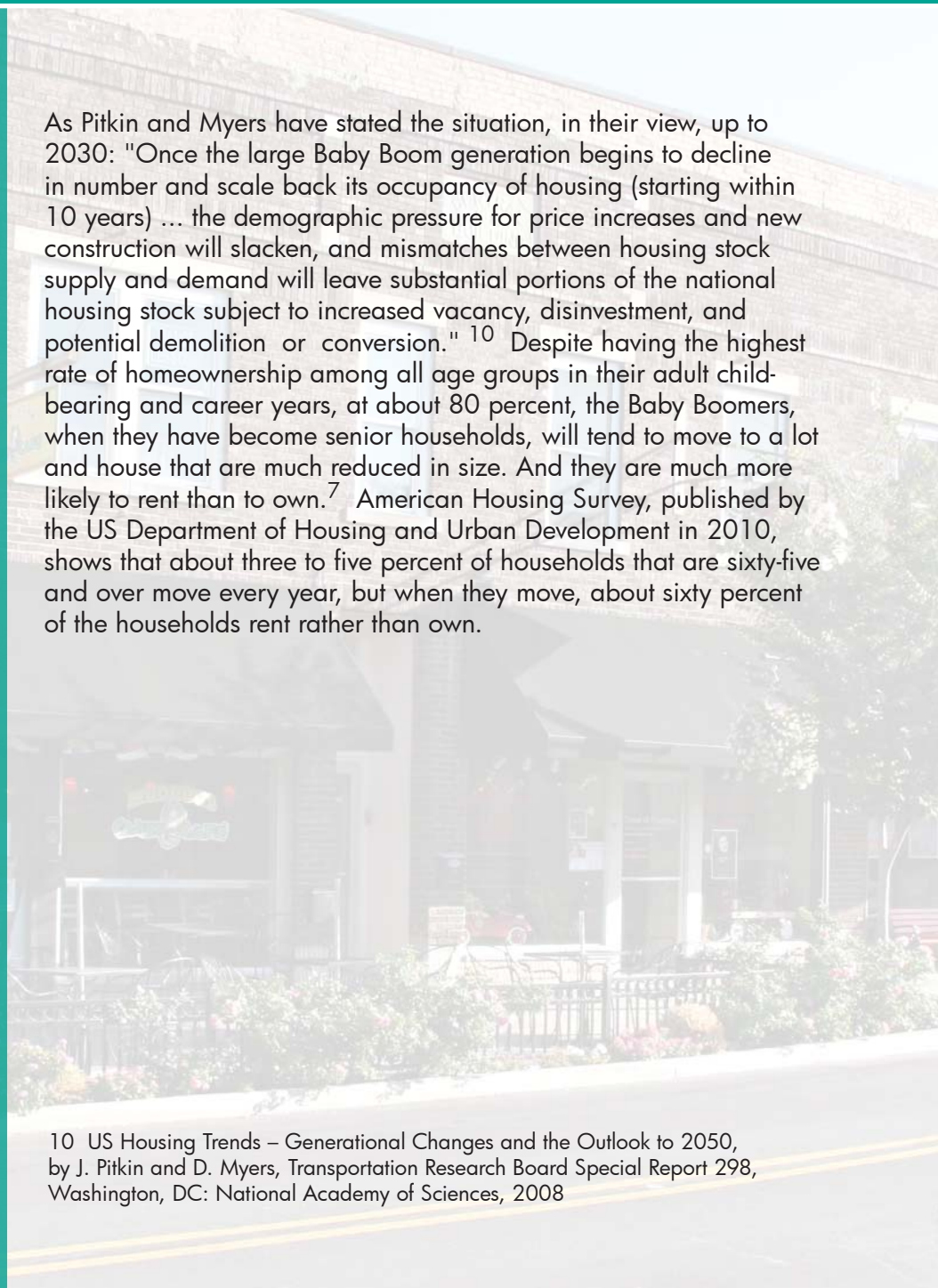
Housing Market 2020-2040

The suburbanization of America between 1960 and 1980 can largely be attributed to the Baby Boomers' own housing and educational needs, which, at the time, could not have been met entirely within the nation's cities. [6] In the period since 1980, from about 1981 to 1995, the country has catered to the educational and housing needs of the Boomers' children, and the Boomers spread out even farther away from the city, into more and more remote suburbs. As the Baby Boomers turn 65 and prepare to retire and downsize, during the period that started in 2011 and will continue to around 2029, they will be leaving behind millions of suburban homes that no longer meet their needs. Because of these changing needs for housing by Baby Boomers, there could very well be more sellers of homes in the 2020s than buyers, in most states in the US. [7]

During the period from 2020 to 2040, Baby Boomers will shift America's housing market in the direction of "senior options," in extremely large numbers. These "senior options" include smaller homes on smaller lots or attached products such as condos and townhouses. Their preference will be for more walkable neighborhoods; closer proximity to grocery stores, drug stores and medical facilities; and other mobility options such as walking, biking, short-distance driving, and bus service. [8] The portion of the population that will consist of seniors will rise from around 13 percent, as recorded in 2010, to approximately 19 percent in 2030. After that it remains about the same through 2040.[9]

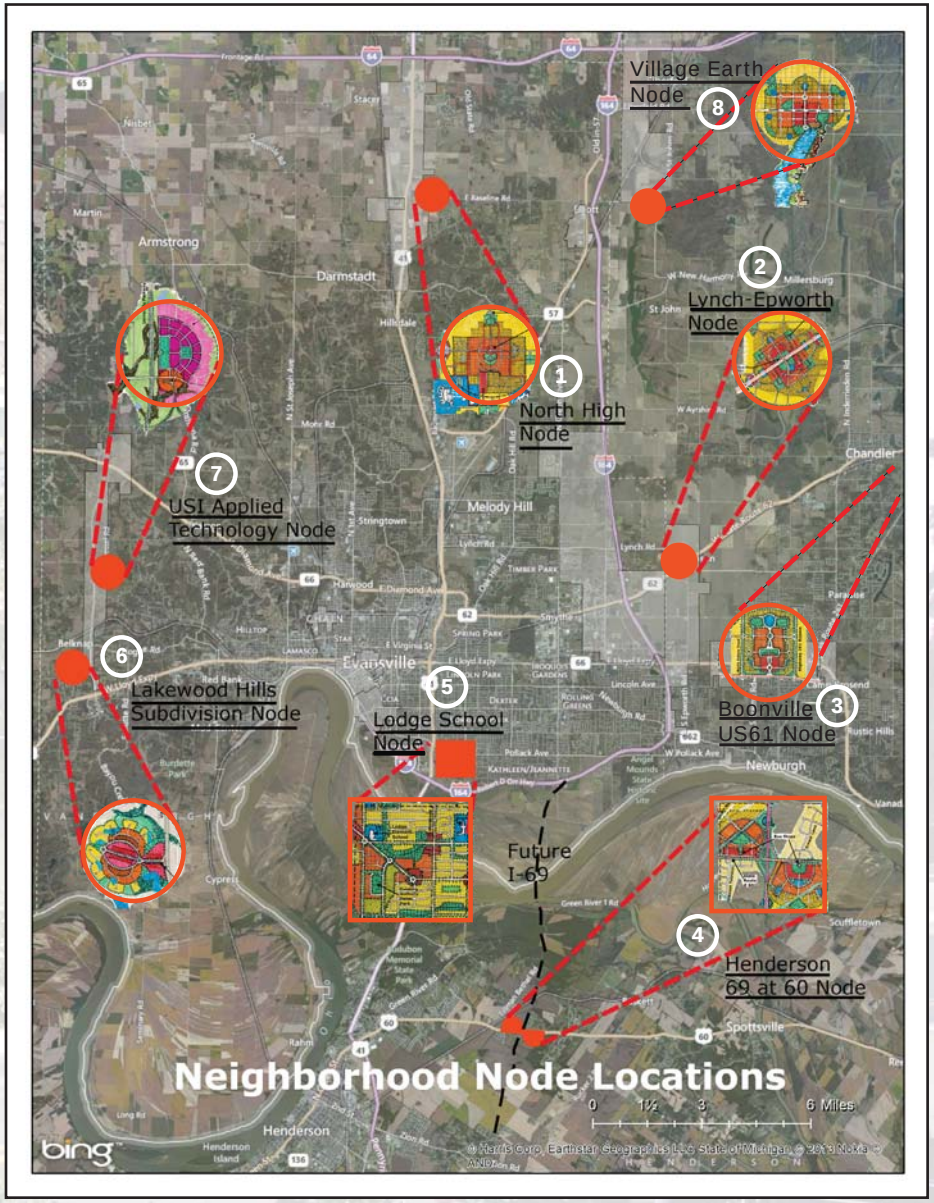
6 *Reshaping Metropolitan America* by Arthur C. Nelson, Island Press, 2000 M Street, NW, Suite 650, Washington, D.C. 20036, 2013
7 "Aging of the baby boomers and the generational housing bubble: Foresight and mitigation of an epic transition," by D. Myers and S.H. Ryu, in Journal of the American Institute of Planners, 74 (1): 17-33, 2008
8 "Catching the next wave," by Arthur C. Nelson in Generations: Journal of Aging and Society, 33 (4), 2010
9 2011 Seniors Industry Outlook, by the ARA National Seniors Housing Group, Dallas, Texas, 2011, http://www.arausa.com/FTP/seniors/ARA%202011%20White%20Paper.pdf

As Pitkin and Myers have stated the situation, in their view, up to 2030: "Once the large Baby Boom generation begins to decline in number and scale back its occupancy of housing (starting within 10 years) ... the demographic pressure for price increases and new construction will slacken, and mismatches between housing stock supply and demand will leave substantial portions of the national housing stock subject to increased vacancy, disinvestment, and potential demolition or conversion." [10] Despite having the highest rate of homeownership among all age groups in their adult child-bearing and career years, at about 80 percent, the Baby Boomers, when they have become senior households, will tend to move to a lot and house that are much reduced in size. And they are much more likely to rent than to own.[7] American Housing Survey, published by the US Department of Housing and Urban Development in 2010, shows that about three to five percent of households that are sixty-five and over move every year, but when they move, about sixty percent of the households rent rather than own.



10 US Housing Trends – Generational Changes and the Outlook to 2050, by J. Pitkin and D. Myers, Transportation Research Board Special Report 298, Washington, DC: National Academy of Sciences, 2008

Figure 3-10: Neighborhood Node Locations



Development Nodes

The following nodes illustrate development designs and densities that create walkable neighborhoods having mixed land uses and accessible parks for residents at all income levels. These node sketches are supposed to serve as illustrative prototypes and are not meant to be taken literally as the only possible configurations that apply to the geographic areas selected. The areas shown are not likely to develop at the same pace as each other or with the exact population densities identified. Some node geographies may experience better market response and will potentially develop more quickly than others. And some of the nodes that are shown may even ultimately develop at higher densities than the illustrations indicate.

Highway 41 Node at North High School in Vanderburgh County

Figure 3-11 suggests a compact neighborhood development centered on Baseline Road just east of Highway 41. The neighborhood is contiguous to the new North High School/ North Middle School, as well as to the Scott Elementary School. As discussed previously, quality schools act as neighborhood and community focal points, rallying neighbors in all sorts of events, competitions, and artistic endeavors. Some development has already begun near the schools. An initial development known as Poet's Square is east of North High School and contiguous to Scott Elementary School. A mixed use component has been proposed along Peck Road, fitting well with the neighborhood "node" approach. Prototype nodes shown in Volume 2, Chapter 2 have distinct components integral to all cohesive neighborhoods. Two of the most critical design components are (1) parks and open spaces within a ten minute walk of all residents; plus (2) pedestrian trails and bikeways connecting all portions of the community. In order to foster safe routes to school for biking and walking, sidewalks are critical for pedestrians. Also, safe designated lanes for bicycles are a crucial neighborhood feature.

Figure 3-11: Highway 41 Node 1

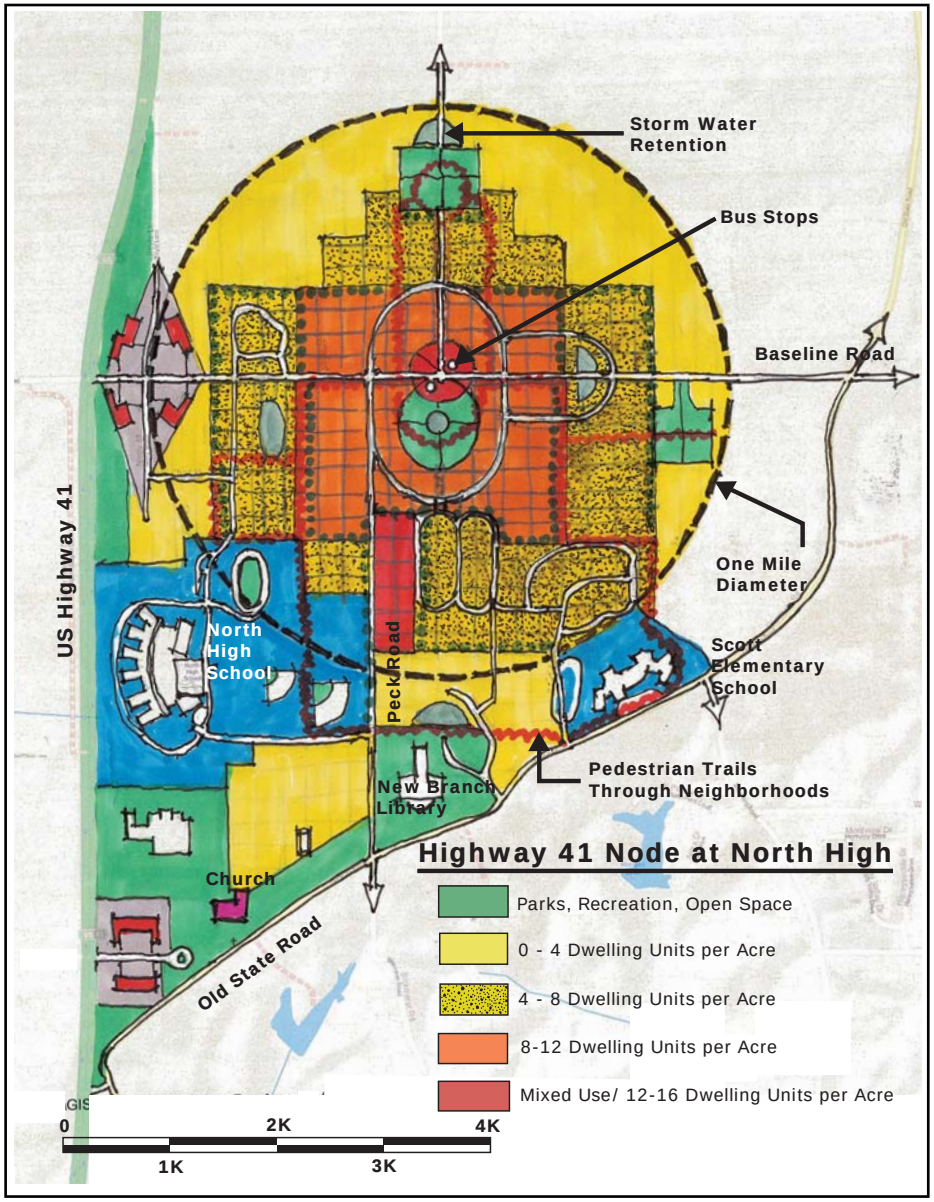
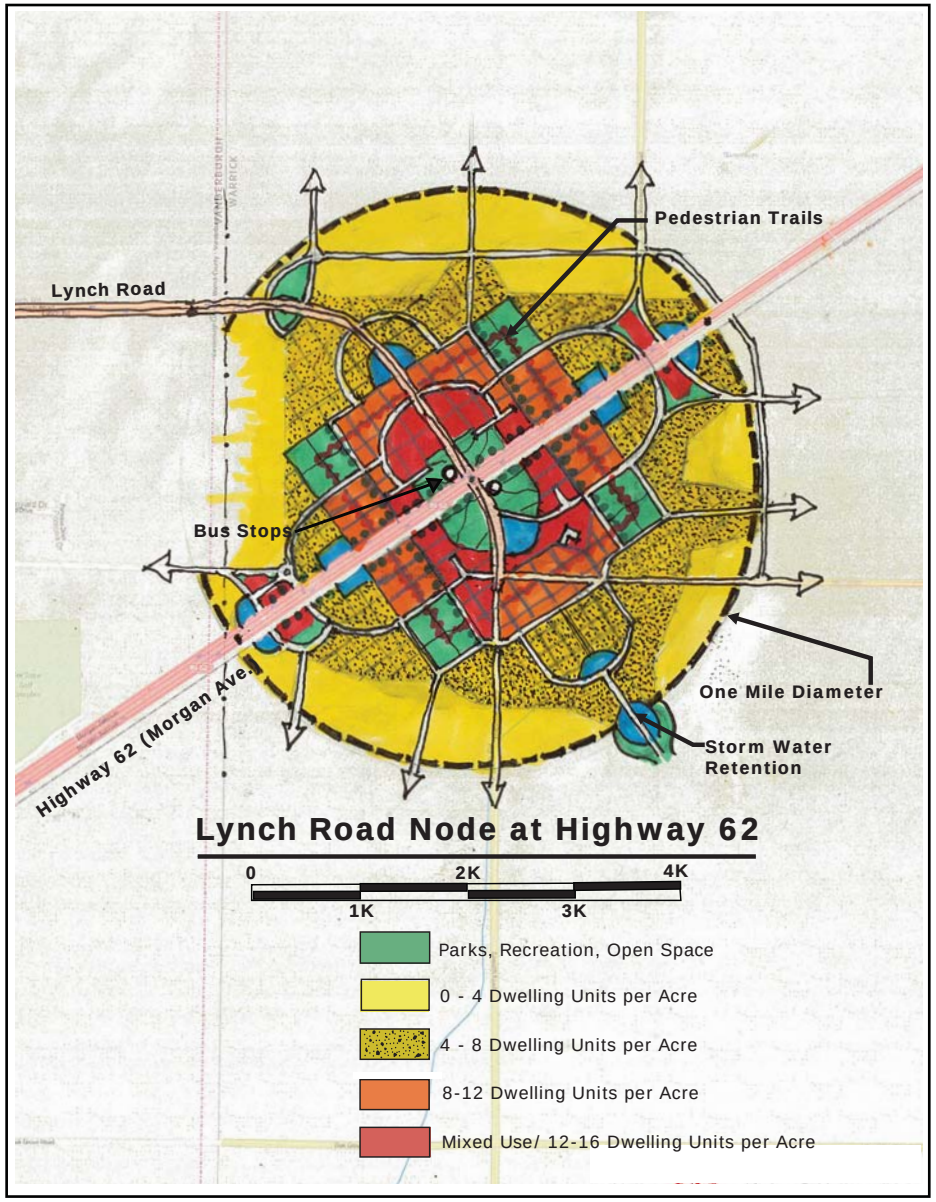


Figure 3-12: Lynch Road Node 2



Lynch Road at Highway 62 in Warrick County

Two major arterials, Lynch Road and Epworth Road, converge with Highway 62 (Morgan Avenue) in the diagram of the regional, mixed use development node pictured to the left in Figure 3-12. This node is situated on low-lying ground and would require a couple of feet of engineered fill. However, its location at the confluence of three arteries and its proximity to the Warrick Wellness Trail make it a desirable location for mixed use development.

Highway 62 on the west fringe of Boonville, Indiana

The node on Boonville's western fringe will start small with local commercial establishments in a mixed-use presentation, perhaps with a low income housing tax credit subsidy to get the development started. The node is best thought of as a relatively low to medium density node, scaled to suit the corridor between Chandler and Boonville. The SR 61 Boonville Bypass project, tying in at the existing SR 62/SR 261 intersection, will become a prime spot for future development. A phased development, which could take some time to build momentum, if done properly, could later become a landmark center of neighborhood commerce and activity as shown in Figure 3-13.

Figure 3-13: Boonville Node 3

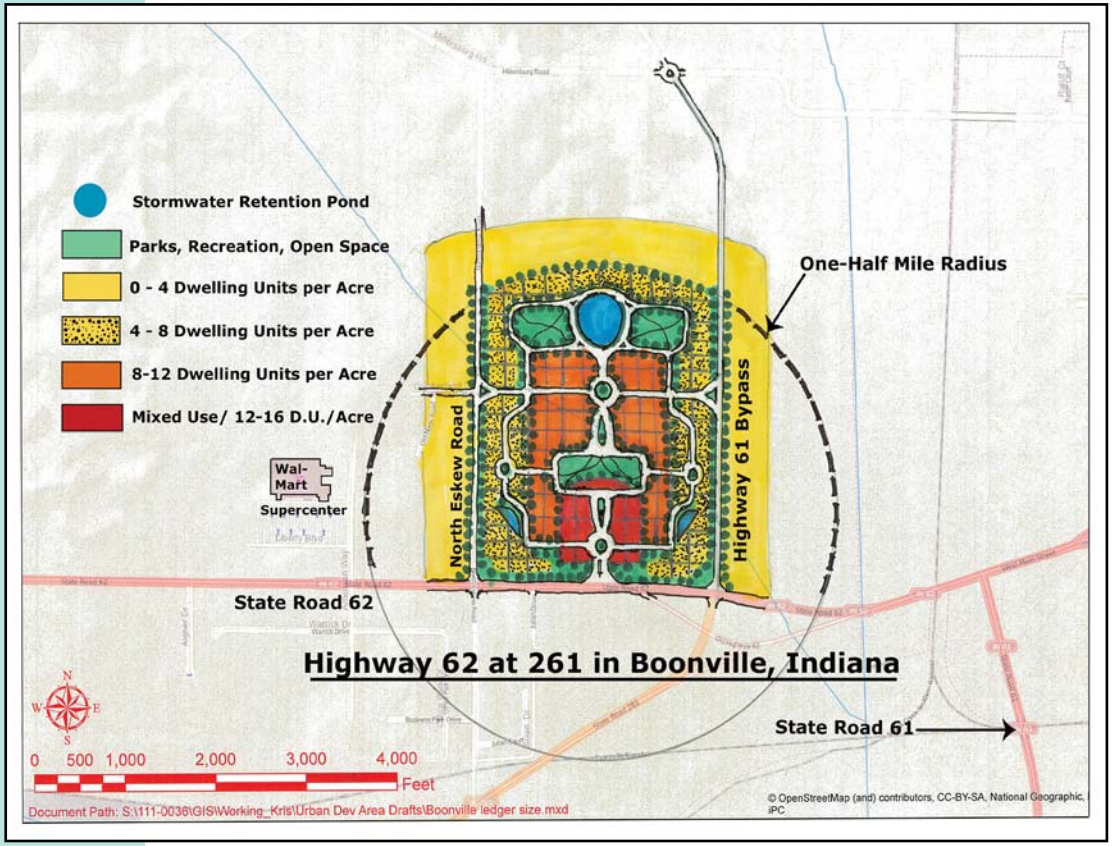
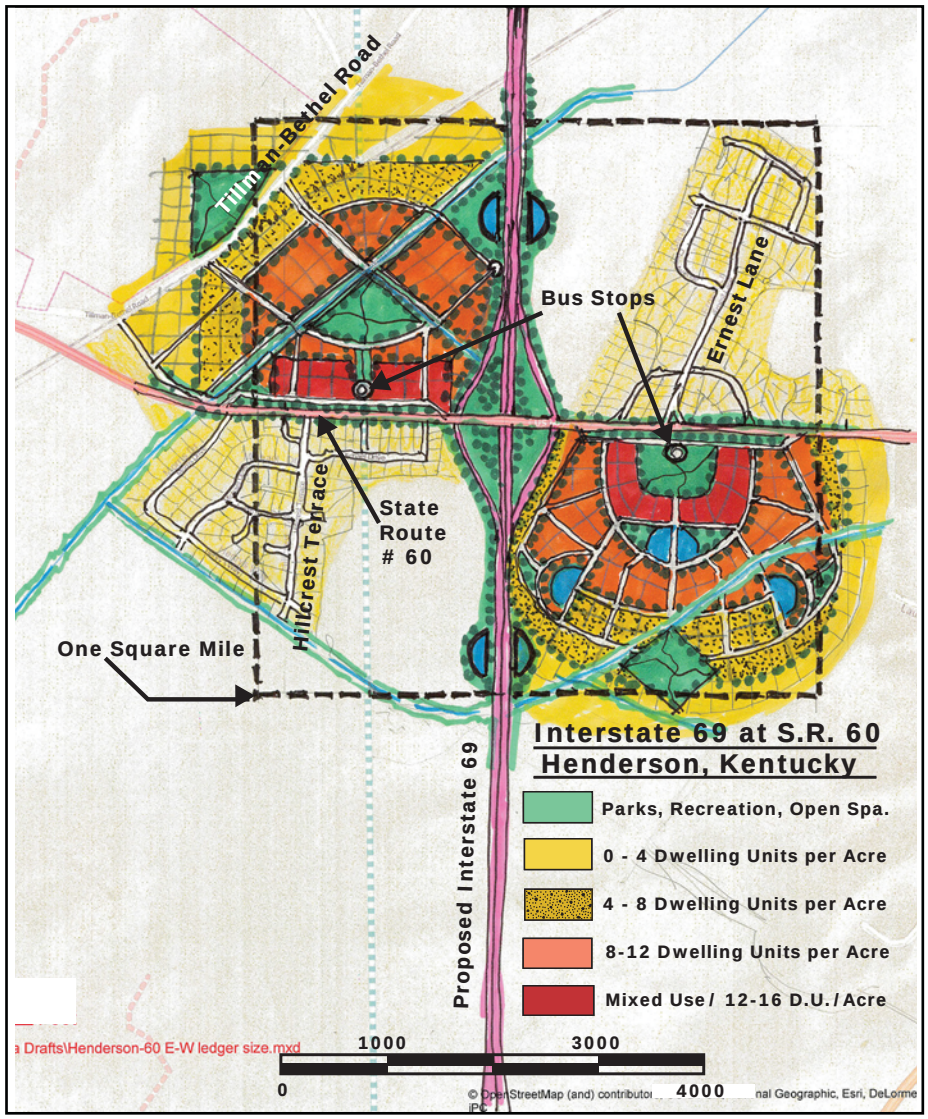


Figure 3-14: I-69 at SR 60 Node 4



US 60 and future I69 in Henderson County

When the new Interstate 69 is constructed to the east of the City of Henderson, Kentucky, connecting to the new bridge over the Ohio River and ultimately joining I164 south of Evansville, new development is very likely to be spawned. The diagram in Figure 3-14 shows a double node, or more appropriately two half nodes in the approximate location of the interchange that will be developed at I69 and US 60. Two subdivisions already exist in this area and future development can logically serve these subdivisions with two medium-scaled mixed use centers that would have dining, entertainment, and shopping services. As always, these nodes should be planned with green space at their center, along with bus stops considered for connection to the existing bus system.

Lodge Elementary School Neighborhood

The neighborhood surrounding Lodge Elementary School, which also contains Fairlawn Elementary School and Holy Spirit Elementary School, is a moderate income, workforce housing neighborhood, with proximity to Highway 41 and its interchange with I164. There is great potential in this area for dense, affordable housing development, along with neighborhood park and open space enhancements.

There is a natural drainage and tree cover system that winds through the neighborhood, with some fairly heavy tree cover in some of the inner block spaces. The site plan shows an effort to connect many of these natural wooded areas with pathways that lead the pedestrians and hikers through the neighborhood in pleasant natural, wooded surroundings as shown in Figure 3-15.

Figure 3-15: Lodge School Node 5

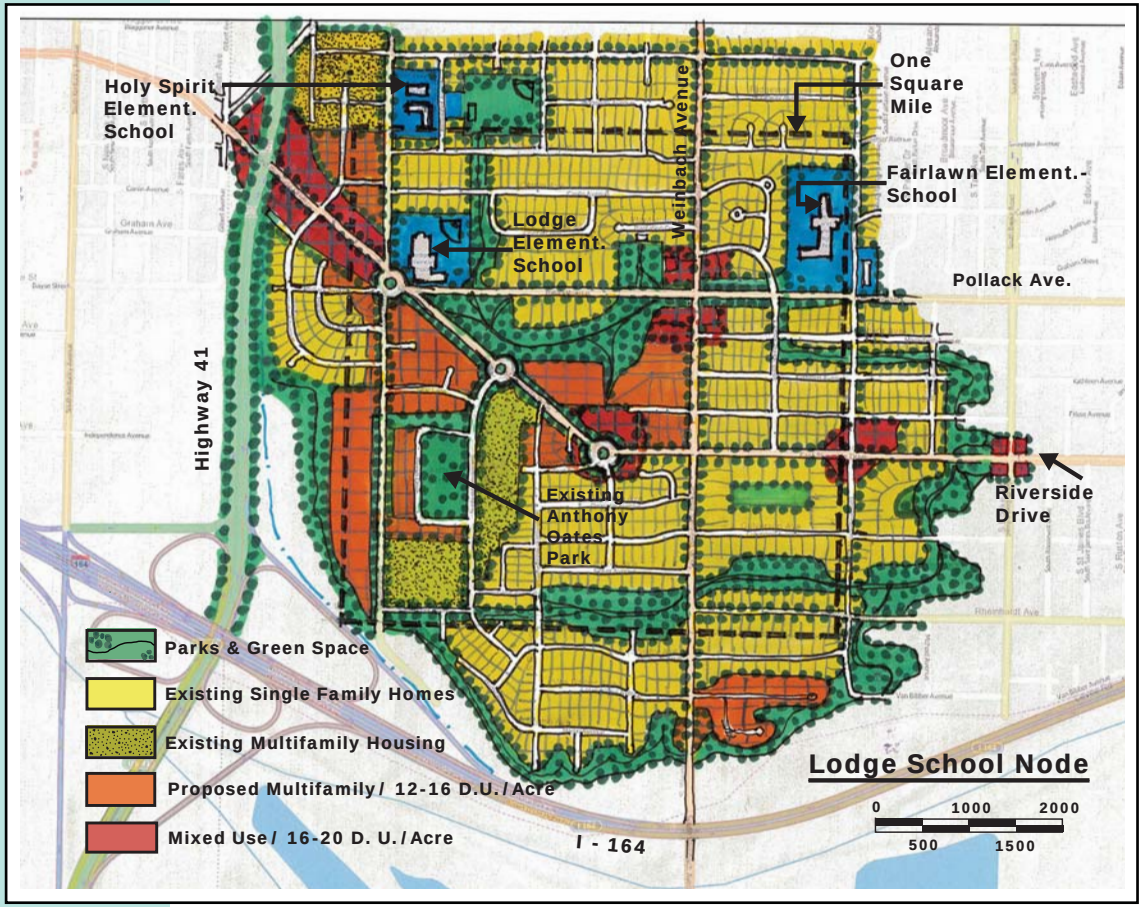
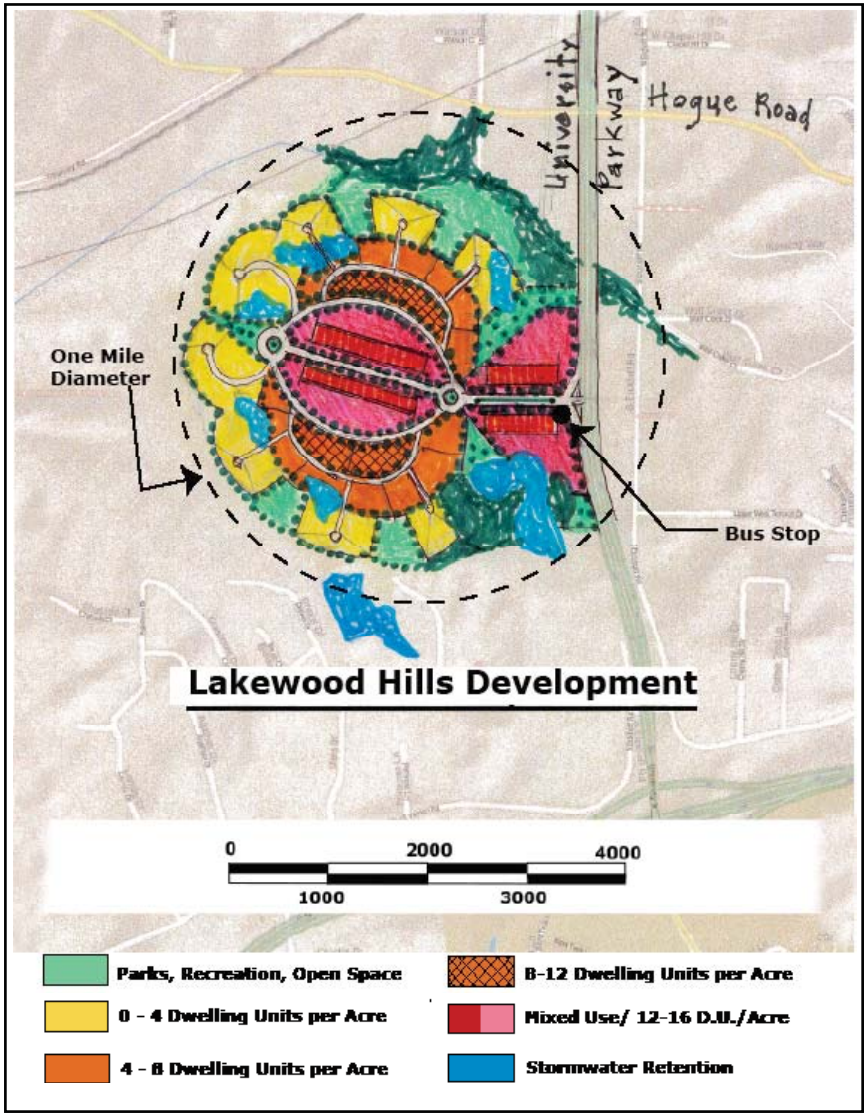


Figure 3-16: Lakewood Hills Development Node 6



Lakewood Hills Development on west side of Evansville, Indiana

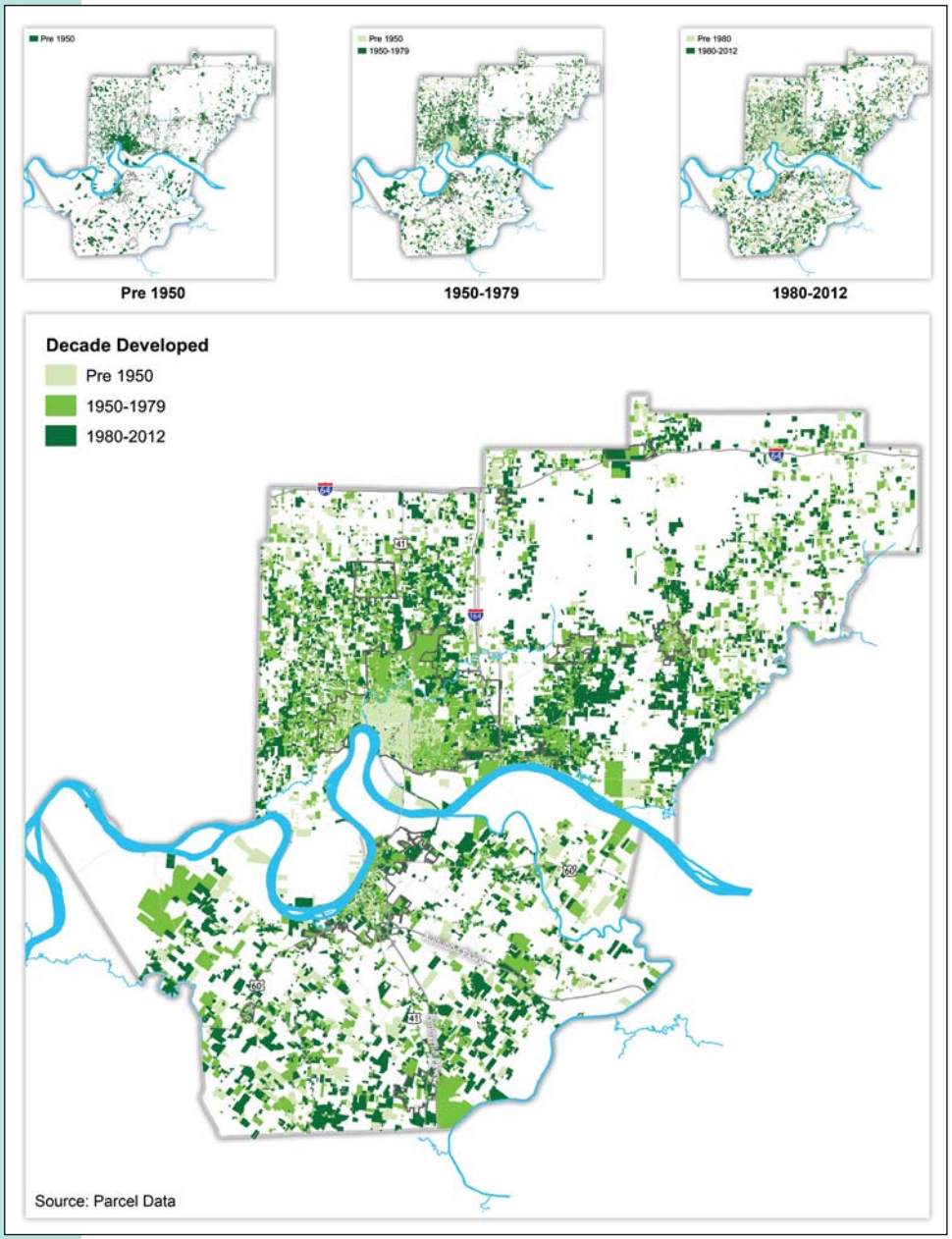
The Lakewood Hills prototype features a mixed use central core surrounded by a variety of residential types including attached dwellings, as well as single family units. One important design issue for future development along University Parkway will be the character of commercial development. Rather than taking on the character of strip commercial/fast food development, use of an appropriately designed frontage road and screening/buffering are critical. This prototype will have the capability of setting design precedents that will carry over into other future development along University Parkway. See Figure 3-16.

LAND USE PLAN

Land Use Plan for Growth and Revitalization

Sustainable land development is a matter of using natural and manmade resources wisely, without waste or profligacy. Wise treatment and conservation of natural resources makes them available and accessible for future generations. As prices for commodities and services continue to rise, it behooves the region to plan for the use of public facilities in a wise, equitable and efficient manner. A part of the land use approach should be a strategy that uses previously-constructed infrastructure to its maximum advantage. When capacity still exists, it makes good sense to try to use already-built-in infrastructure and resources, before spending the time and money to create more. The alternative plans presented in the Growth and Revitalization Plan utilize varying degrees of pre-existing infrastructure. The associated costs of development are also presented, in order to compare four growth approaches and their long term cost implications. In all cases, the Growth and Revitalization Plan ultimately strives to strike a balanced growth approach, allowing for innovation and flexibility, while optimizing the taxpayers' investments. The Historic Growth and Development Maps in Figure 3-17 show patterns of land development since 1950. The growth trends displayed in these Historic Growth Maps form the basis for extrapolating into the future to envision what development might look like in 2040 if the region conducts "business as usual."

Figure 3-17: Historic Growth and Development



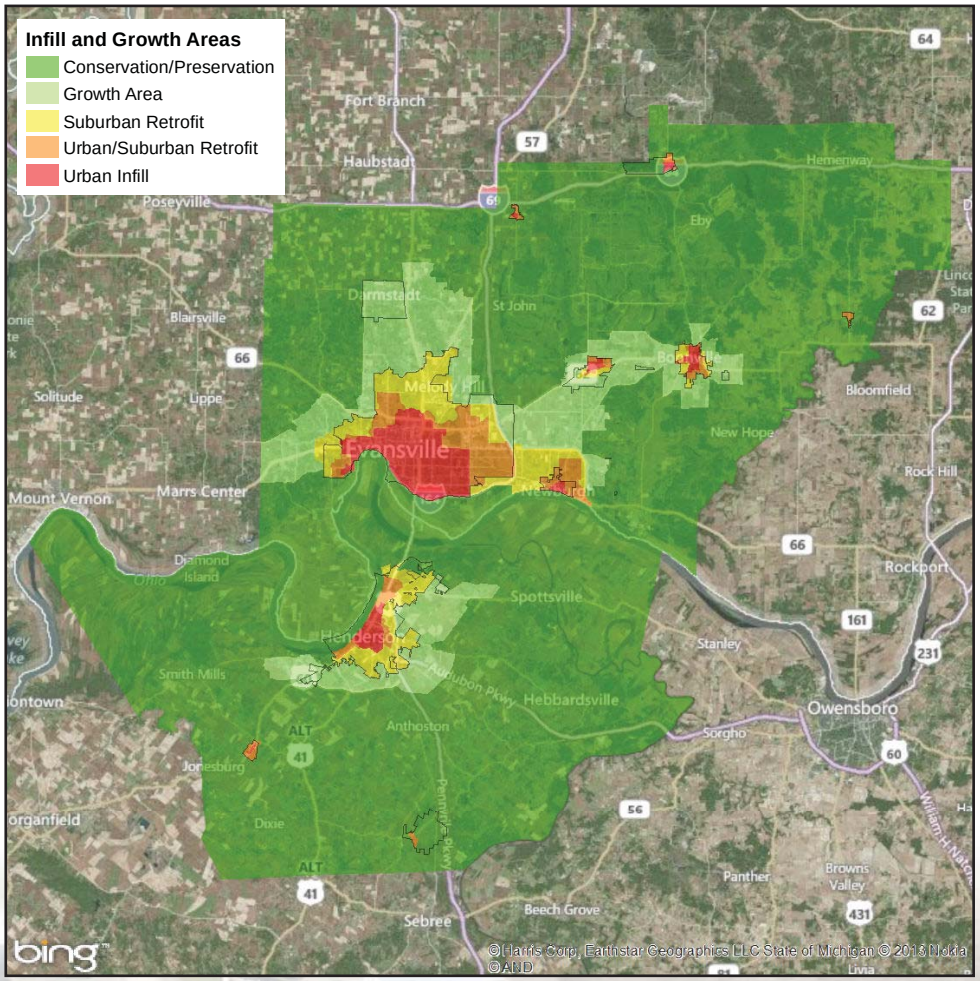
Suitable Land Development Concept

In the alternative approaches to land development that follow, an attempt has been made to concentrate development near the main transportation arteries to bring people closer to needed services such as food, healthcare, employment and entertainment, and thereby reduce total vehicle miles traveled. This concentration of resources and clustering of residential development and supporting services, saves time and fuel, while lowering congestion, greenhouse gas emissions, and the number of traffic-related accidents. When residents spend less time in their automobiles and more time with their friends and families, road rage decreases and blood pressures subside.

The other theme that runs through the favored land use and transportation options is the emphasis on alternative modes of travel besides the automobile. Provision of ample space and safe distances for pedestrian trails and bikeways, connecting and running through our neighborhoods and commercial developments, is a sustainable strategy that contributes to better air quality and healthier lifestyles. Walking and biking are two of the best aerobic modes of travel. Daily use of pedestrian trails and bike corridors is a sure means to combat obesity. The Growth and Revitalization Plan, Metropolitan Transportation Plan (MTP2040), Workforce and Senior Housing Plan, and Environment/Green Infrastructure Plan all utilize the theme of **interconnectivity** of all modes of travel, throughout the Region.

It is significant to note that the Vanderburgh, Warrick, Henderson County region is expected, by most prognosticators' population projections, to grow slowly and deliberately. For the past two or three decades, consumption of raw land has outpaced population growth, making urban sprawl and its effects on prime farmland of utmost concern. Of even greater concern is the out-migration of young adults and their families due to the lack of employment opportunities, the lack of diverse housing options, and the dearth of cohesive neighborhoods. Therefore, the land use and housing prescriptions in this Plan are more about setting design standards for quality environments than about over-regulating the housing and developer markets. "Quality environments" include employment environments, living environments, social and entertainment environments, natural resource feature environments, and shopping/dining environments. The zoning and land use recommendations in Chapter 7 are not presented in an effort to constrain developers, to retard economic development, or to violate private property rights. They are presented as means to incentivize developers, optimize scarce resources, set high quality standards for commercial and residential development, meet modern market demand for housing and public services, and make the region the very best it can be. The overall goal is not to turn people away from a growing, thriving community, but to inspire them to stay.

Figure 3-18: Infill and Growth Areas



Developing the Scenarios Concept

When developing the scenarios, it was first important to understand the definition and location of infill areas. Initial thoughts included a simple yes or no answer when determining whether an area could be defined as an infill area or not. It was then decided that breaking down infill and "not infill" into more development categories would help in the development of scenarios.

Ultimately, all land in the three-county area was defined as being in one of five different categories as shown in Figure 3-18. The Urban Infill areas include the original, pre-1950 development patterns of the region's cities and towns. The Urban/Suburban Retrofit areas include the initial suburban development that occurred between 1950 and 1980. The Suburban Retrofit areas include the second wave of suburban development that occurred between 1980 and today. The Growth Area is that area just beyond the current suburban development that is the next logical location for new "greenfield" development. The Conservation/Preservation area is the area well beyond existing development that currently includes rural housing and farmland.

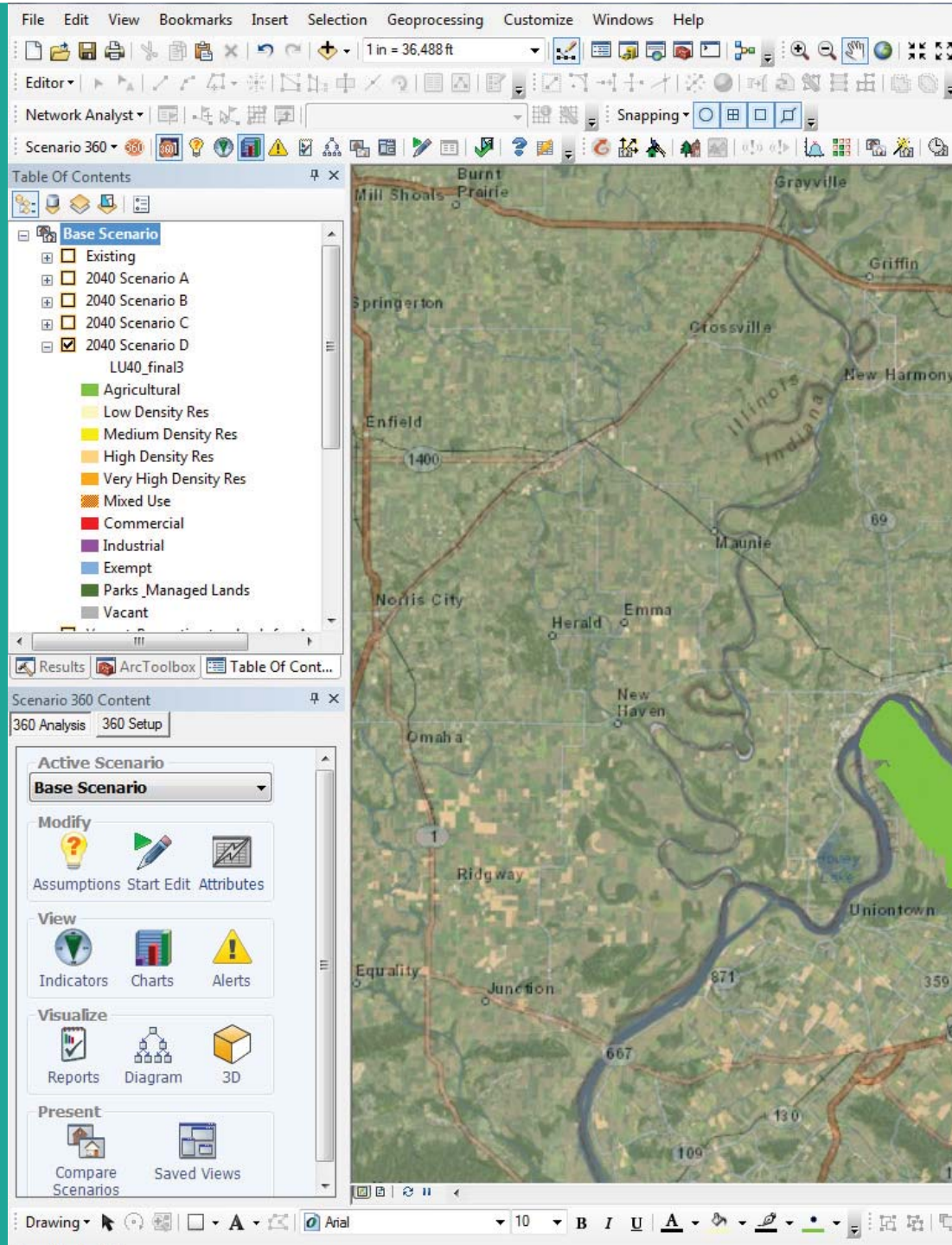
These development categories helped in the development of each of the four scenarios. More detail about each of these scenarios follows.

Land Use Plan

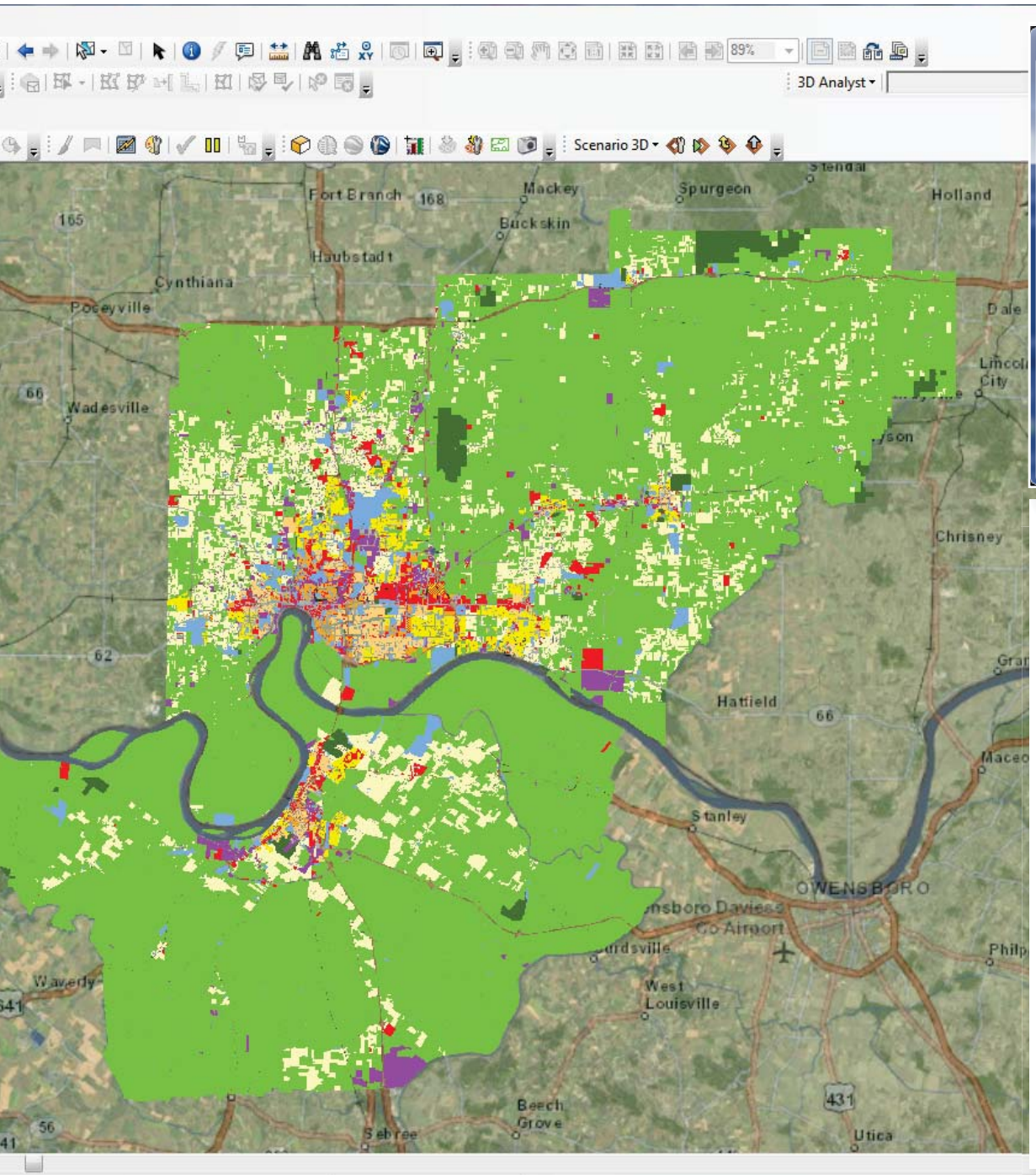
Utilizing CommunityViz and HELPViz Software

CommunityViz is a software package that extends general-purpose GIS mapping with special capabilities for community and regional planning. CommunityViz offers a wide array of tools for analysis, visualization, and communication about planning alternatives and their impacts. The CommunityViz methodology for working with maps, information and plans is called scenario planning or geodesign. [4] HELPViz software, which is used to convert parcelized data in broader Traffic Analysis Zones (TAZ), was used in the scenario planning process outlined below. Combined, CommunityViz and HELPViz were used to project land uses into four future scenarios.

The computerized Land Use Model, structured and presented through the CommunityViz and HELPViz software, has been utilized for land use and future growth assumptions upon which the travel demand and transportation system modeling shown in Volume 3 (Metropolitan Transportation Plan 2040) were based.



4 *The Planners Guide to CommunityViz: The Essential Tool for a New Generation of Planning,* by Doug Walker and Tom Daniels, American Planning Association Planners Press, copyright 2011 the Orton Family Foundation. CommunityViz is a product of Placeways, LLC, which developed the program with the support of the Orton Family Foundation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Mackey
Spurgeon
Holland
Buckskin
Haubstadt
Cynthiana
Poseyville
Wadesville
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Chrisney
Hattiield
Stanley
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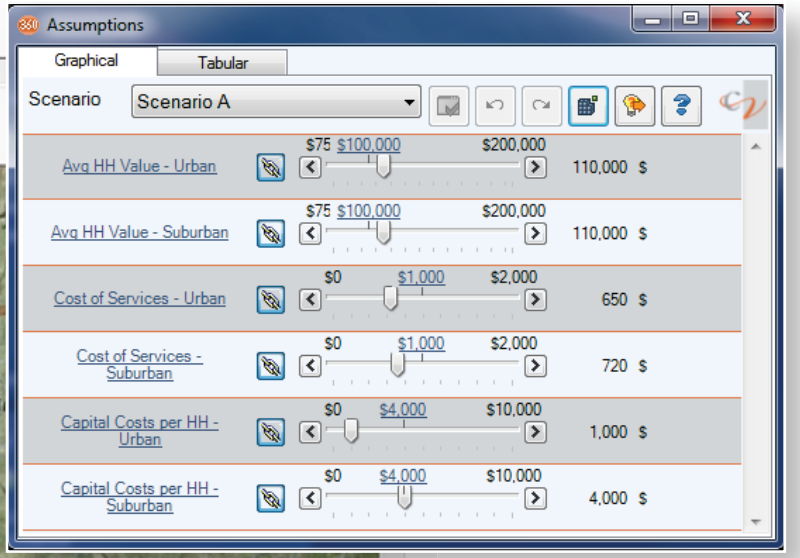
Assumptions
Graphical
Tabular
Scenario
Scenario A
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110,000 $
Avg HH Value - Suburban
$75 $100,000 $200,000
110,000 $
Cost of Services - Urban
$0 $1,000 $2,000
650 $
Cost of Services - Suburban
$0 $1,000 $2,000
720 $
Capital Costs per HH - Urban
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1,000 $
Capital Costs per HH - Suburban
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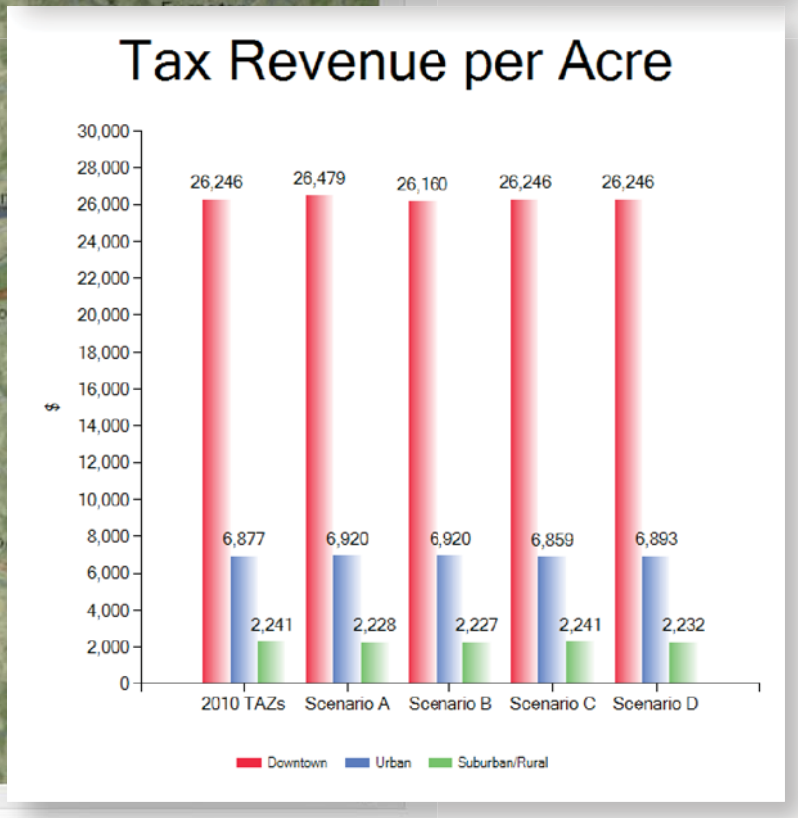
Tax Revenue per Acre
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12,000
10,000
8,000
6,000
4,000
2,000
0
26,246
26,479
26,160
26,246
26,246
6,877
6,920
6,920
6,859
6,893
2,241
2,228
2,227
2,241
2,232
2010 TAZs
Scenario A
Scenario B
Scenario C
Scenario D
Downtown
Urban
Suburban/Rural

Future Land Use Scenarios

Existing land uses and past development trends were used to determine future development patterns to the year 2040. An initial "business as usual" scenario was created based on these past trends. Three additional scenarios were then created with progressively greater amounts of infill development (development on vacant properties within existing city limits) and less "greenfield" development (development in farm fields, forests, and other undeveloped areas).

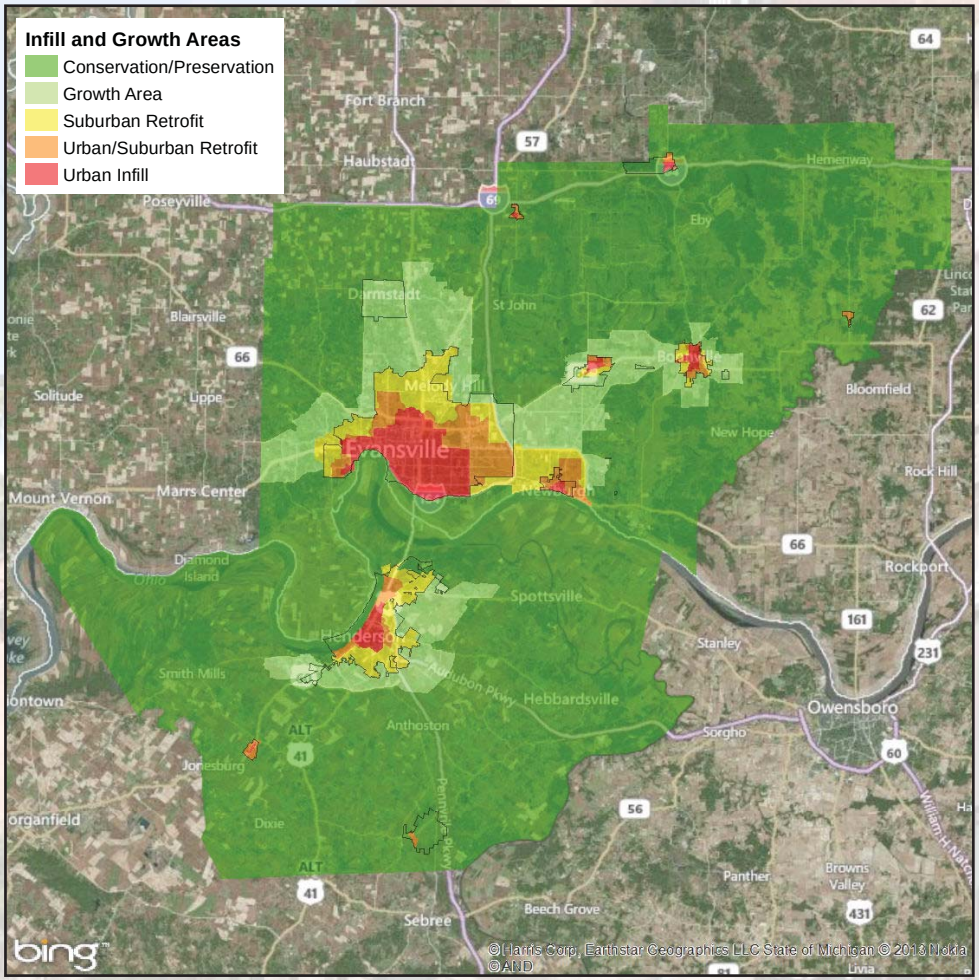
The four scenarios include (more details for each scenario follow):

1. **Scenario A** – Trend Line to 2040 ("business as usual")
2. **Scenario B** – Predominately New Development (higher percentage of "greenfield" development)
3. **Scenario C** – Predominately Infill Development (higher percentage of infill development)
4. **Scenario D** – Green Growth 2040 (maximum amount of infill development)

Table 3-1: Growth and Conservation Areas Explanation Table

	Urban Infill	Urban/Suburban Retrofit	Suburban Retrofit	Growth Area	Conservation/ Preservation
	Current Conditions				
City/Town Limits	Within	Majority within	Majority within	Outside	Outside
Average Housing Age	80 yrs	50 yrs	30 yrs	20 yrs	50 yrs
Streets	Small Grid	Medium Grid/ Subdivision Streets	Mostly Subdivision Streets	Rural Roads	Rural Roads
Commercial Development	Multi-Story/ Small Setbacks	Small Stores/ Strip Centers/ Big Box Stores	Strip Centers/ Big Box Stores	Limited Commercial Space	Very limited Commercial Space
Parking Lots	Parking garages, small lots	Medium/Large Lots	Large Lots	Large Lots	Large Lots
Farmland	None	Small Plots	Small/Medium Plots	Large Plots	Large Plots
	Urban Infill	**Urban/Suburban Retrofit**	**Suburban Retrofit**	**Growth Area**	**Conservation/ Preservation**
	Future Development Patterns				
Future Development Type	Infill/ Brownfield	Infill/ Brownfield/ Greenfield/ Greyfield	Greenfield/ Greyfield/ Farmland	Greenfield/ Farmland	Greenfield/ Farmland
	Conceptual Scenario Breakdown				
Scenario A	0%	5%	15%	40%	40%
Scenario B	10%	5%	20%	40%	25%
Scenario C	20%	10%	25%	35%	10%
Scenario D	30%	20%	30%	15%	5%

Figure 3-19: Growth and Conservation Areas Map

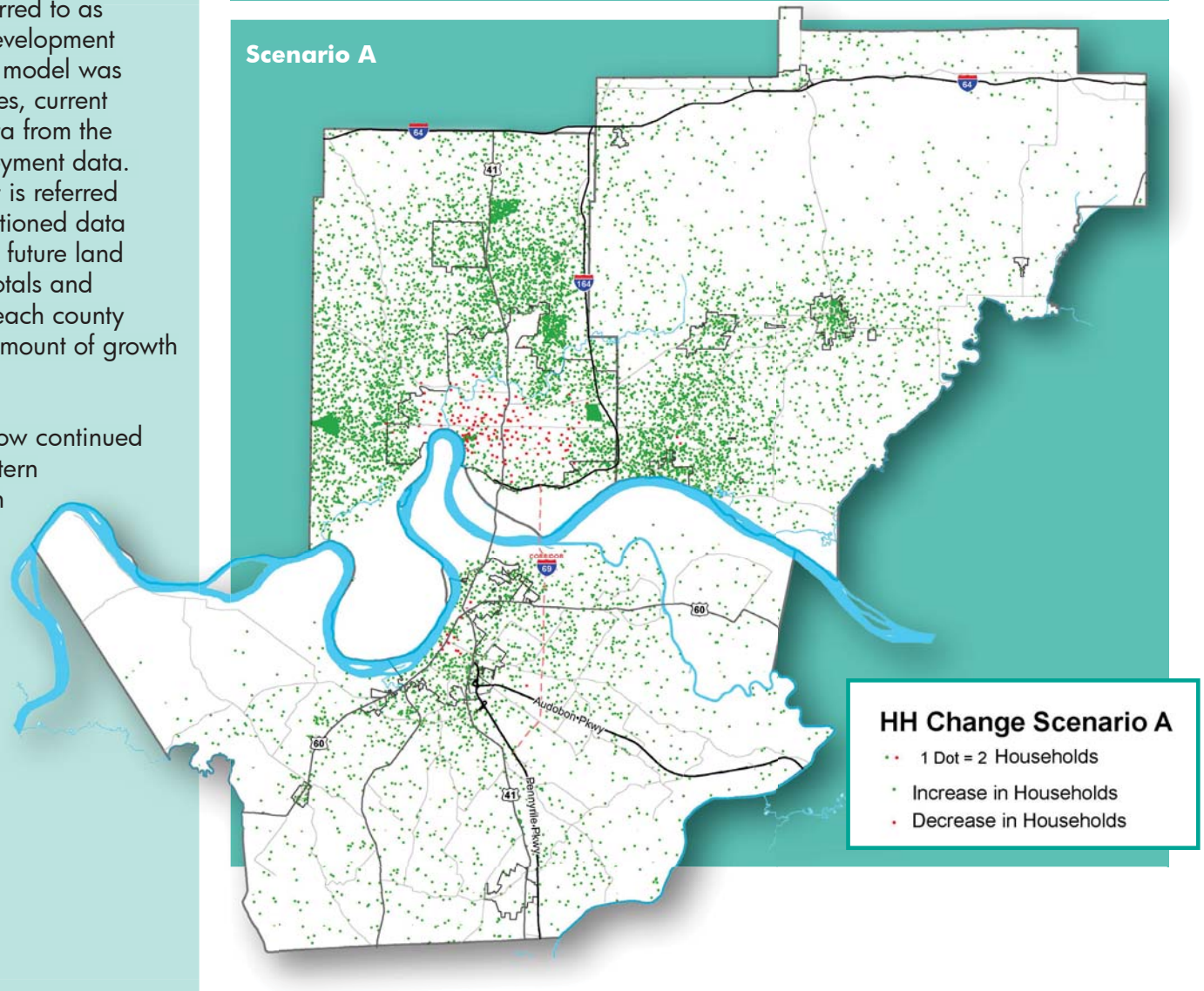


Scenario A – Trend Line to 2040

Scenario A – Trend line to 2040, also referred to as "business as usual," is a continuation of development trends over the past 20 years. A land use model was developed using existing and past land uses, current and historic population and household data from the US Census, and current and historic employment data. The land use model created for this project is referred to as HELPViz. HELPViz uses the aforementioned data and a GIS database of parcels to create a future land use scenario for the year 2040. Control totals and development capacities of the parcels for each county were included in the model to define the amount of growth throughout the three-county region.

The results of the Scenario A model run show continued outward development in northern and western Vanderburgh County, southern and eastern Henderson County, and southwestern Warrick County. The model also shows a continued decline in infill development and an increase in vacant properties within the city limits of both Henderson and Evansville.

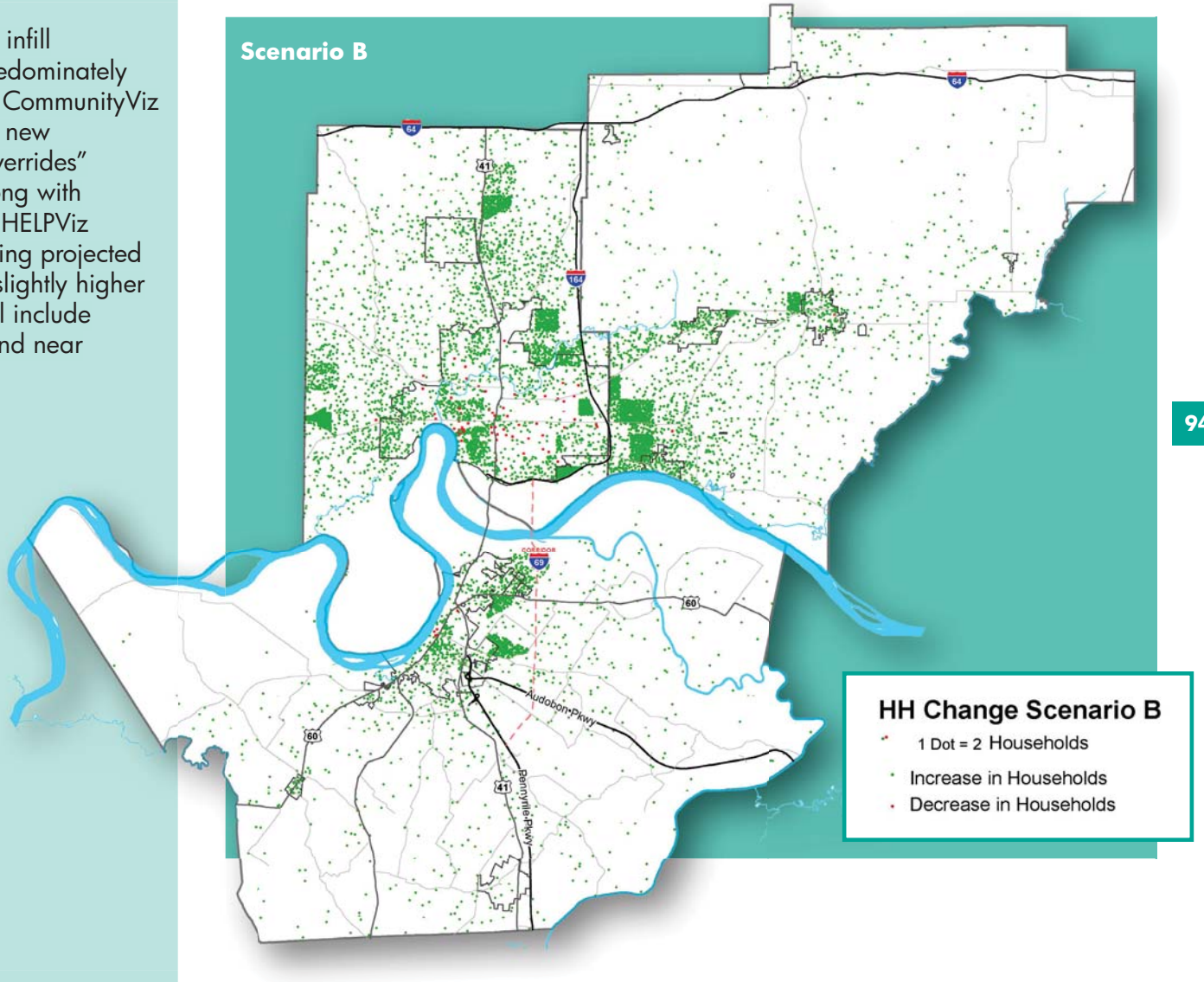
Figure 3-20: HH Change Map for Scenario A



Scenario B – Predominantly New Development

Scenario B includes a higher percentage of infill development than Scenario A, but is still predominately new development in "greenfield" locations. CommunityViz was used to manually place some infill and new development in specific locations. These "overrides" were then added to the HELPViz model, along with a lower vacancy rate than Scenario A. The HELPViz model was then run to distribute the remaining projected growth. Results of this model run include a slightly higher percentage of infill than Scenario A, but still include development in existing agricultural fields and near forested areas.

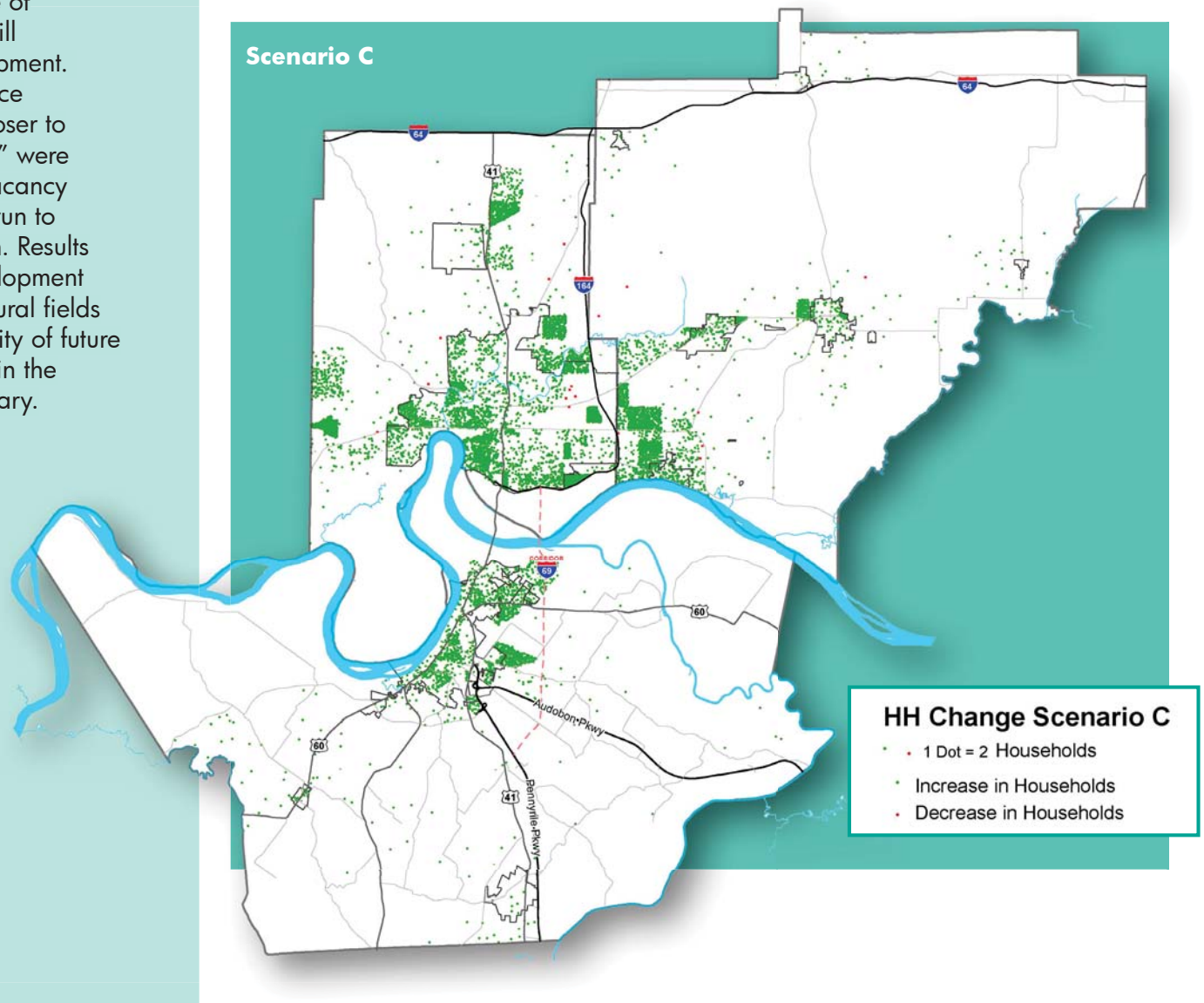
Figure 3-21: HH Change Map for Scenario B



Scenario C – Predominantly Infill

Scenario C includes a higher percentage of infill development than Scenario B, but still allows for some new "greenfield" development. CommunityViz was used to manually place additional infill and new development closer to the existing urban area. These "overrides" were added to HELPViz, along with a lower vacancy rate than Scenario B. HELPViz was then run to distribute the remaining projected growth. Results of this model run include more infill development and less development in existing agricultural fields than Scenario A or Senario B. The majority of future development in this scenario will be within the Evansville-Henderson Urban Area Boundary.

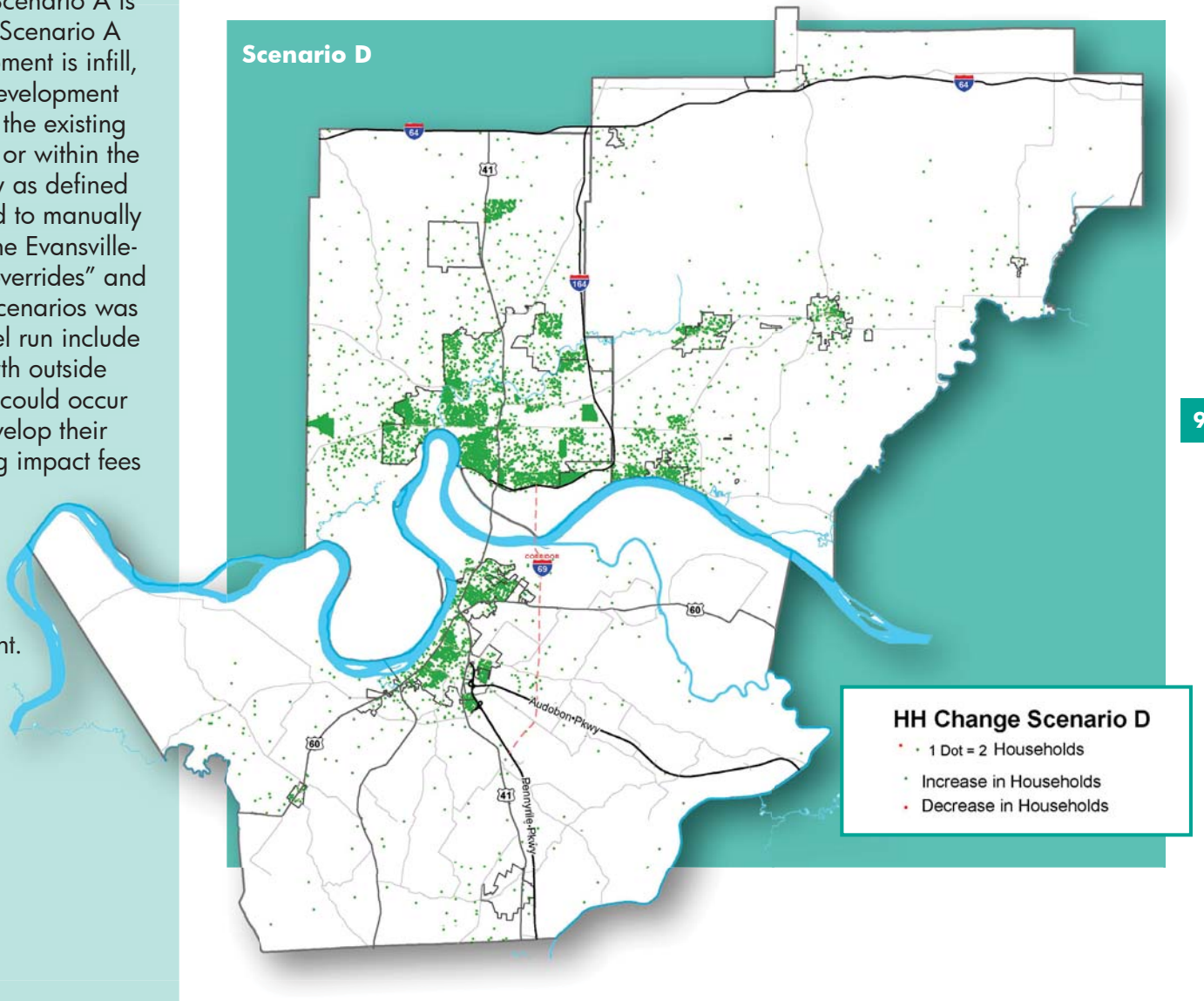
Figure 3-22: HH Change Map for Scenario C



Scenario D – Green Growth 2040

On the opposite end of the spectrum from Scenario A is Scenario D – Green Growth 2040. While Scenario A assumes that less than 10% of new development is infill, the goal of Scenario D is 90% of all new development between 2010 and 2040 should be within the existing city limits of the municipalities in the region or within the Evansville-Henderson Urban Area Boundary as defined by the US Census. CommunityViz was used to manually place most of the projected growth within the Evansville-Henderson Urban Area Boundary. These "overrides" and a lower vacancy rate than all of the other scenarios was then input into HELPViz. Results of this model run include a high percentage of infill and limited growth outside of the Urban Area Boundary. This scenario could occur by providing incentives to developers to develop their projects in specific locations; or by charging impact fees for developing in less prioritized locations; or via changes to the current zoning ordinances that would prescribe higher density development in select locations already served by public infrastructure – all implemented to encourage infill development.

Figure 3-23: HH Change Map for Scenario D



Scenario Results

After completing HELPViz land use model runs for each of the Scenarios, and analyzing the data using CommunityViz, the final results were compared. Each scenario had a goal for the percentage breakdown of each type of development, as shown in Table 3-1. The actual results of the model runs are shown in Table 3-2. The results are in line with the original goal. The slight differences are due to the model's allocation methods and the residual capacity for future development of some areas.

Selecting a Future Scenario

The GIS-based planning software, CommunityViz, was used to determine the benefits and costs associated with each scenario. Results show that Scenario A is not sustainable and could lead to financial difficulties for local governments in the future. Results also show that Scenario D is not completely realistic, since some level of "greenfield" development is likely to occur in the future. The goal of the benefit/cost analysis is to determine whether Scenario B, Scenario C, or some combination of the two is the most realistic for this region. In the final analysis, it makes sense to consider combining both scenarios into a phased approach to 2040.

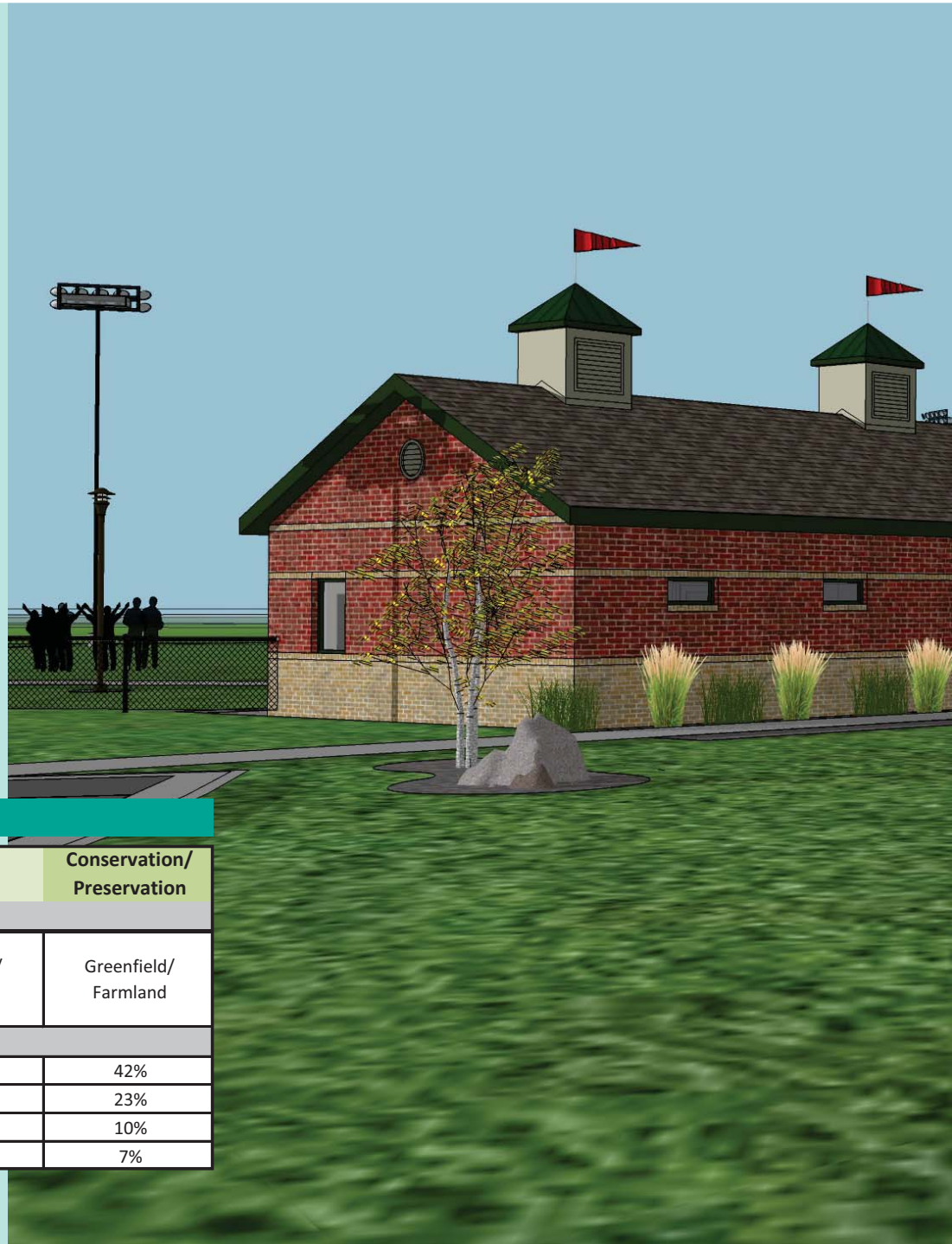


Table 3-2: Growth and Conservation Areas Results Table

	Urban Infill	Urban/Suburban Retrofit	Suburban Retrofit	Growth Area	Conservation/ Preservation
	Future Development Patterns				
Future Development Type	Infill/ Brownfield	Infill/ Brownfield/ Greenfield/ Greyfield	Greenfield/ Greyfield/ Farmland	Greenfield/ Farmland	Greenfield/ Farmland
	HELPViz Scenario Results				
Scenario A	0%	5%	15%	38%	42%
Scenario B	10%	5%	20%	42%	23%
Scenario C	20%	11%	26%	33%	10%
Scenario D	30%	17%	31%	15%	7%

Courtesy of VPS Architecture

Courtesy of VPS Architecture

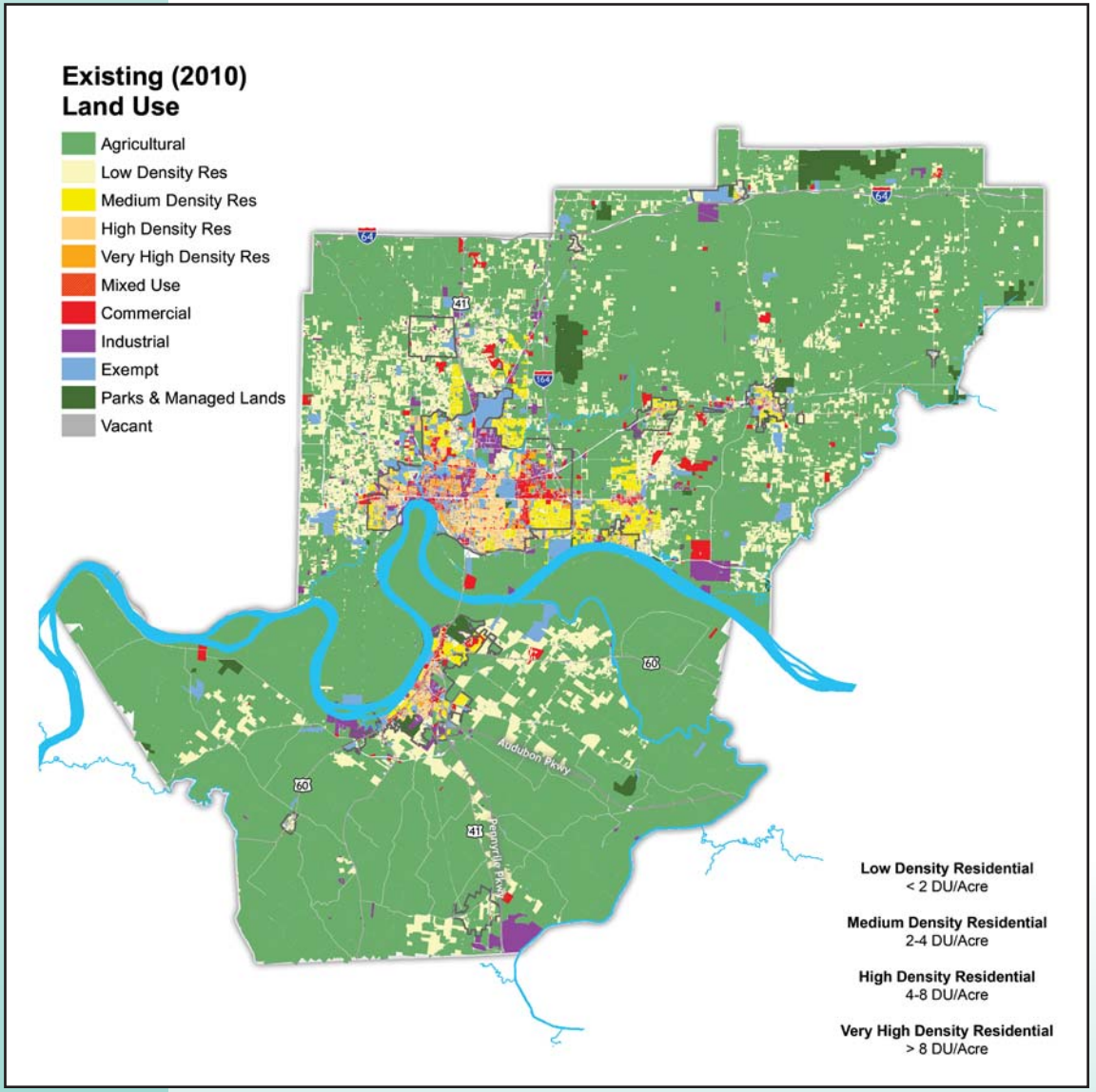
Courtesy of VPS Architecture

Land Uses by Scenario

The existing land uses for the three-county region were gathered from parcel layers for each county. Due to differences in land use categories and definitions between Vanderburgh County, Warrick County, and Henderson County, common land use categories were created. CommunityViz was used to make any necessary adjustments to the existing land uses to make sure they were consistent across all three counties.

The HELPViz land use model utilized this existing land use layer as one of its main inputs. After running the multiple scenarios, the land use model created multiple outputs, such as 1) traffic analysis zones (TAZs) for inputting into the travel demand model and 2) parcel data that can be further analyzed using CommunityViz. The parcel layer outputs include land uses for all three counties for each of the four 2040 scenarios. CommunityViz was used to compare and analyze the land uses from the existing parcel data and the four future year scenarios.

Figure 3-24: Existing Land Use Map



Scenario A

All four scenarios assumed the same population, household, and employment growth between 2010 and 2040. However, increases in housing and employment densities between the four scenarios meant that less land was needed in some scenarios to accommodate the exact same number of houses and businesses. As mentioned previously, Scenario A is primarily based on past growth trends. This scenario is referred to as the "Business As Usual" scenario. On the other end, Scenario D, also known as the "Green Growth" scenario, assumes that much of the new development over the next 30 years is infill and high density.

Figure 3-25: Scenario A Land Use Map

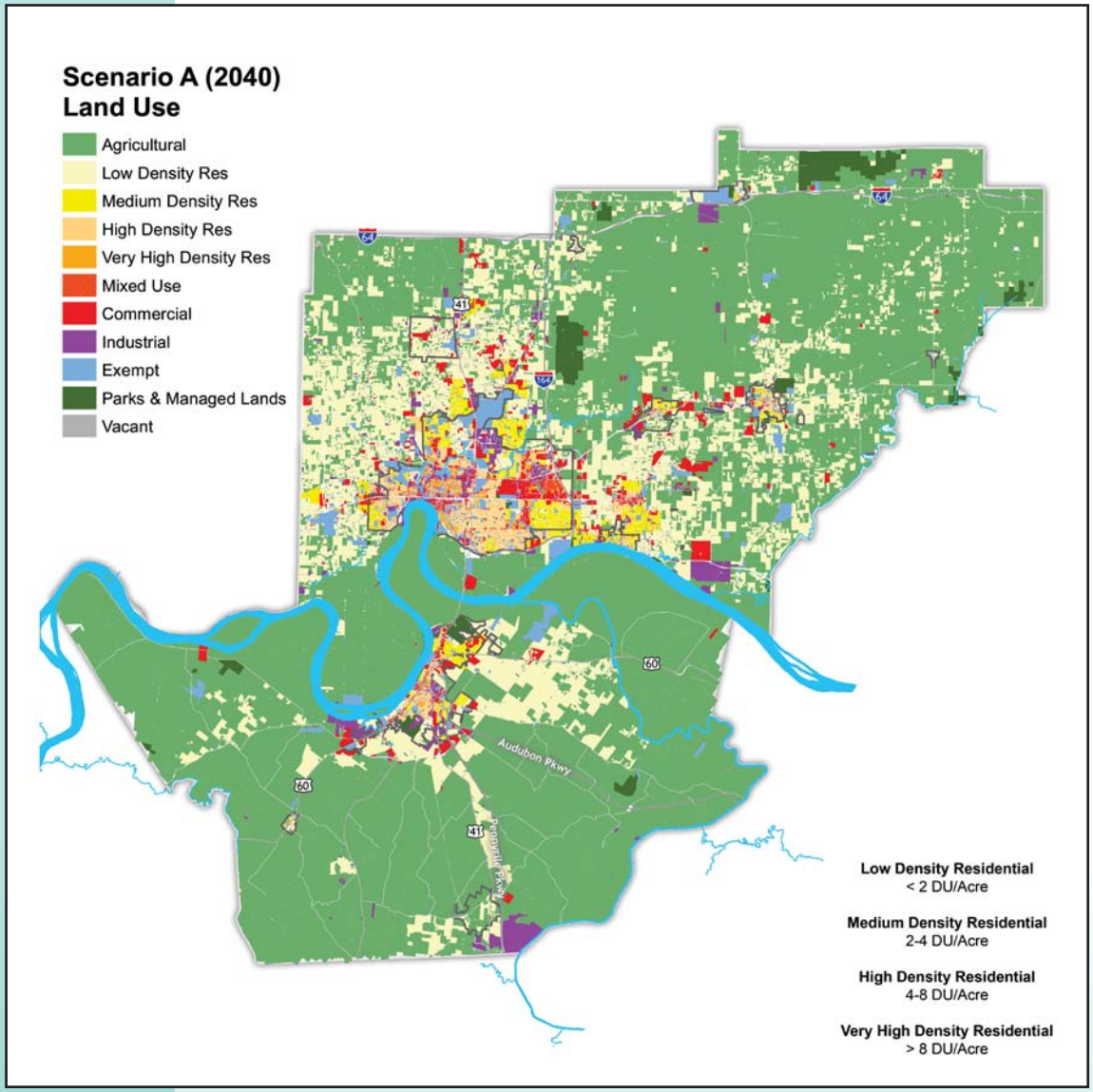
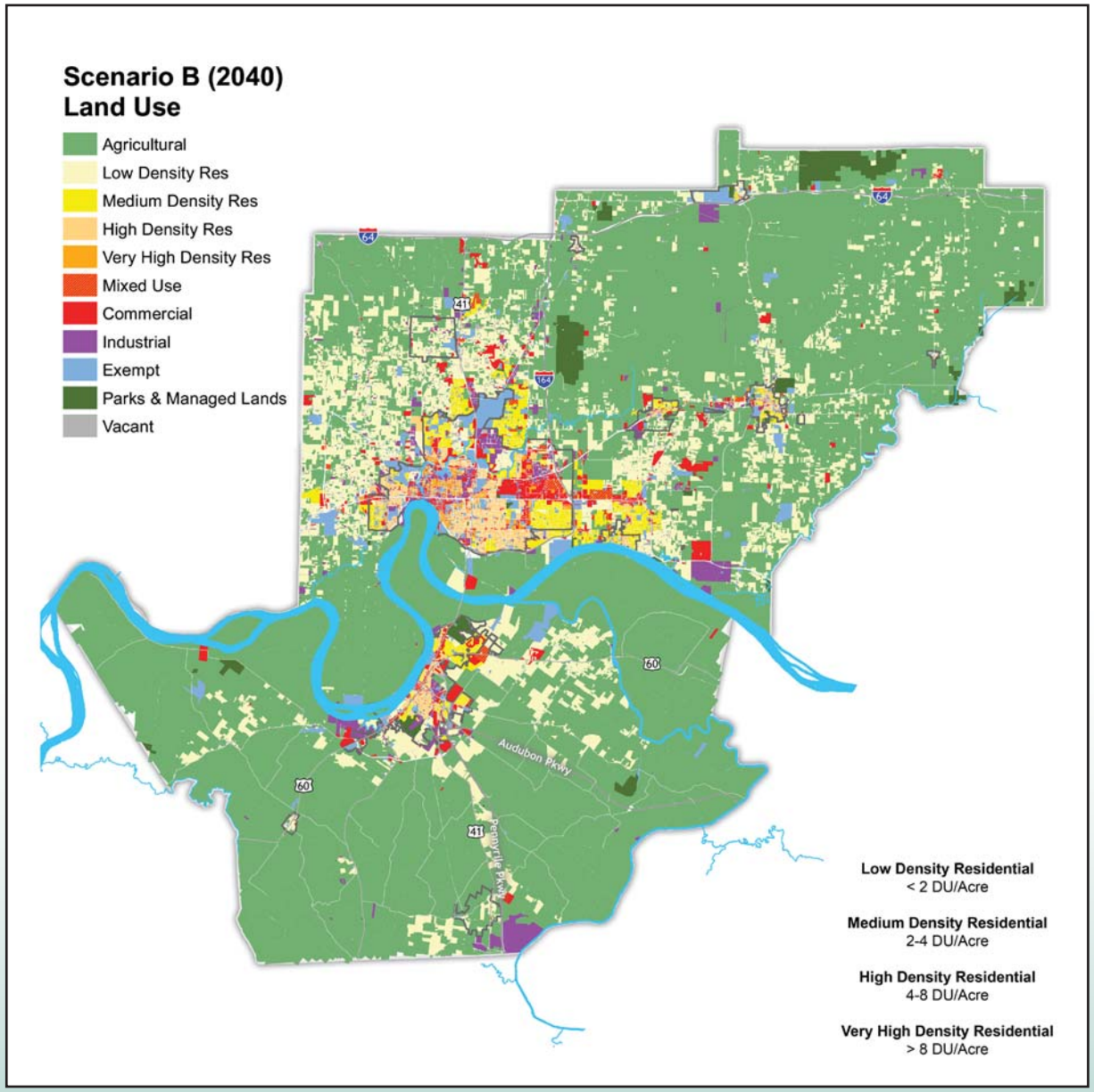


Figure 3-26: Scenario B Land Use Map



Scenarios B, C and D

Scenarios B and C are variations of the "Business As Usual" scenario and the "Green Growth" scenario. Scenario B has a higher amount of infill than Scenario A, but still exhibits more greenfield development than infill. Scenario C has an even higher amount of infill than Scenario B, but not to the extent of Scenario D.

Figure 3-27: Scenario C Land Use Map

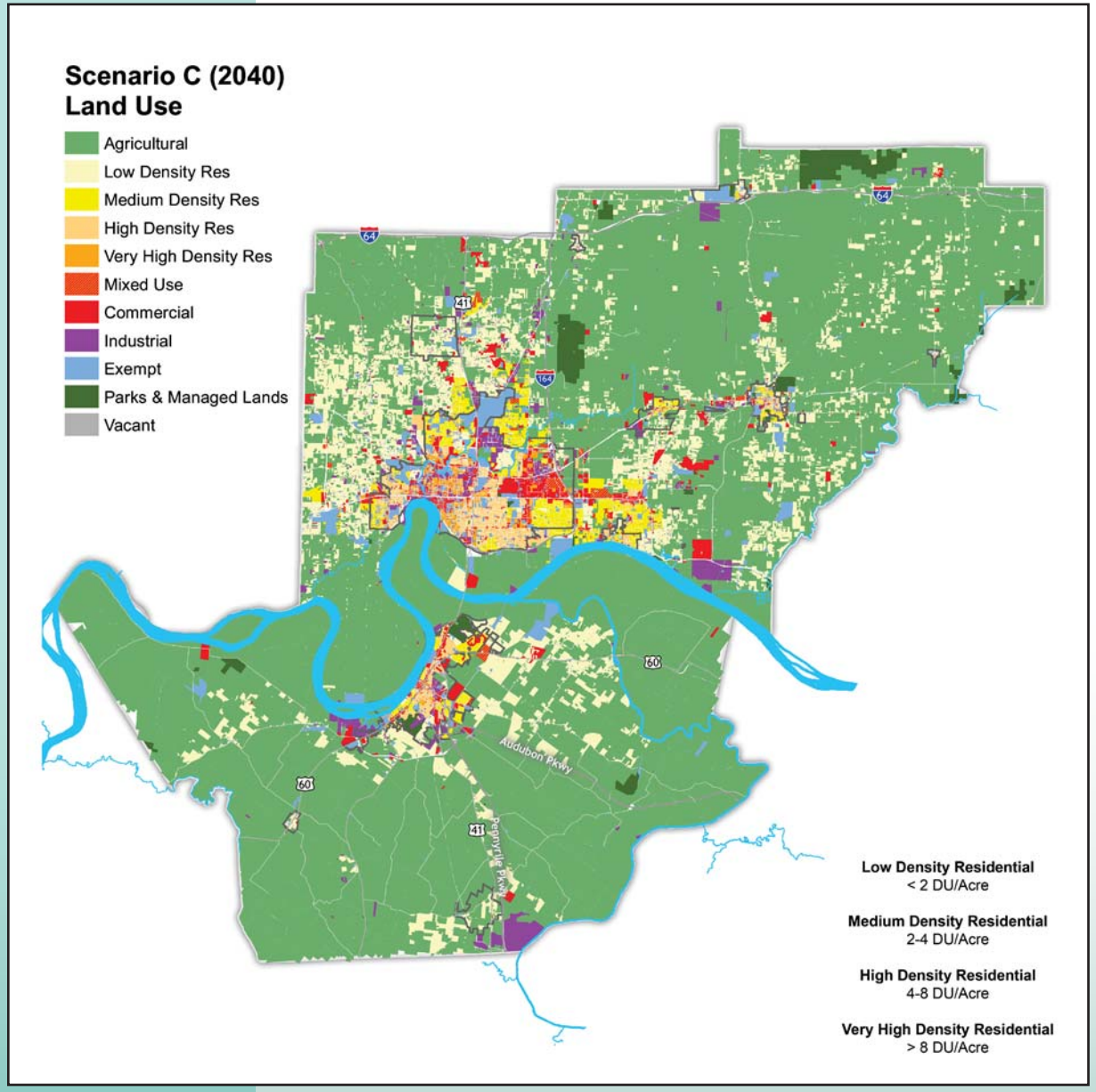
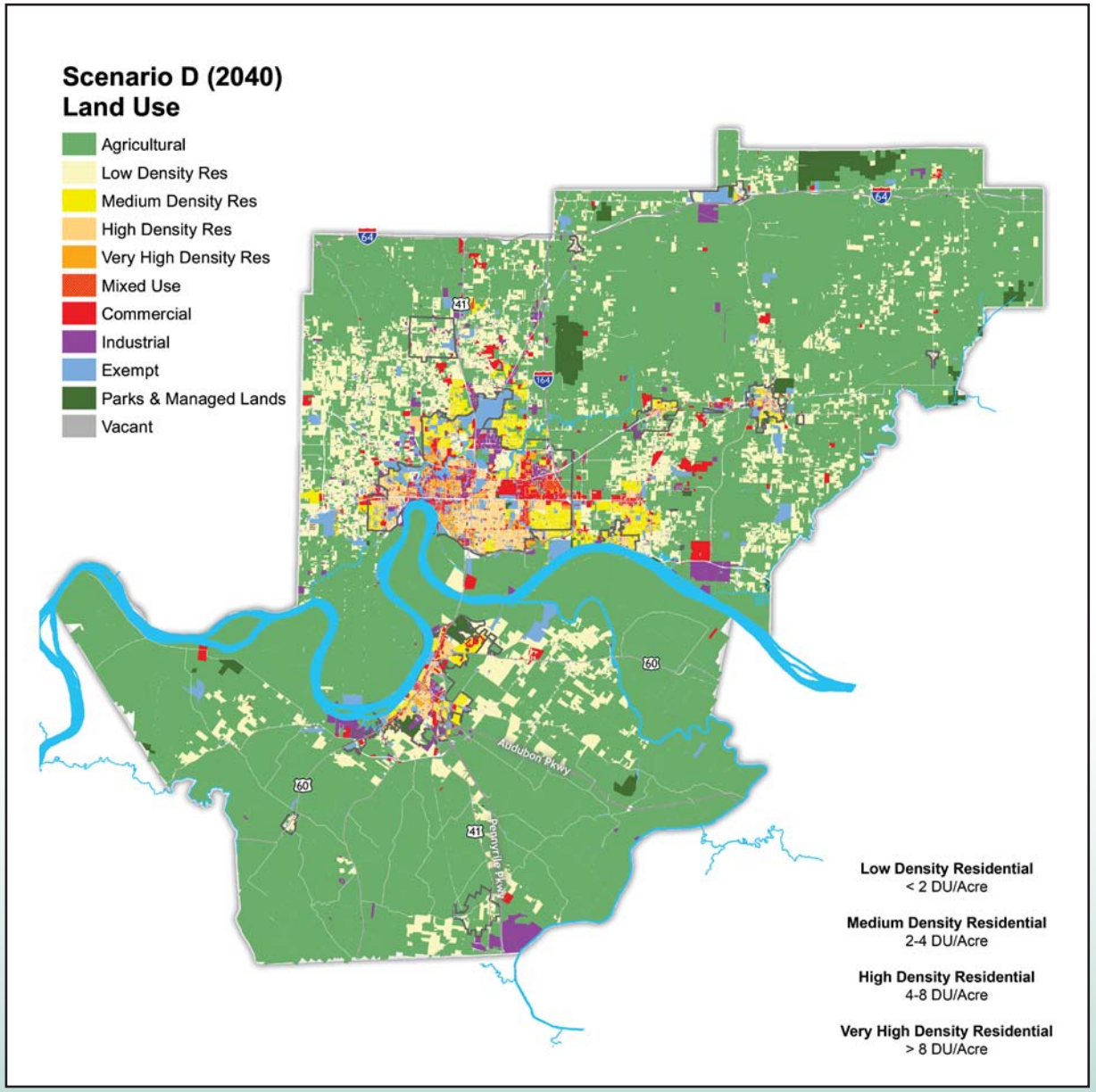


Figure 3-28: Scenario D Land Use Map

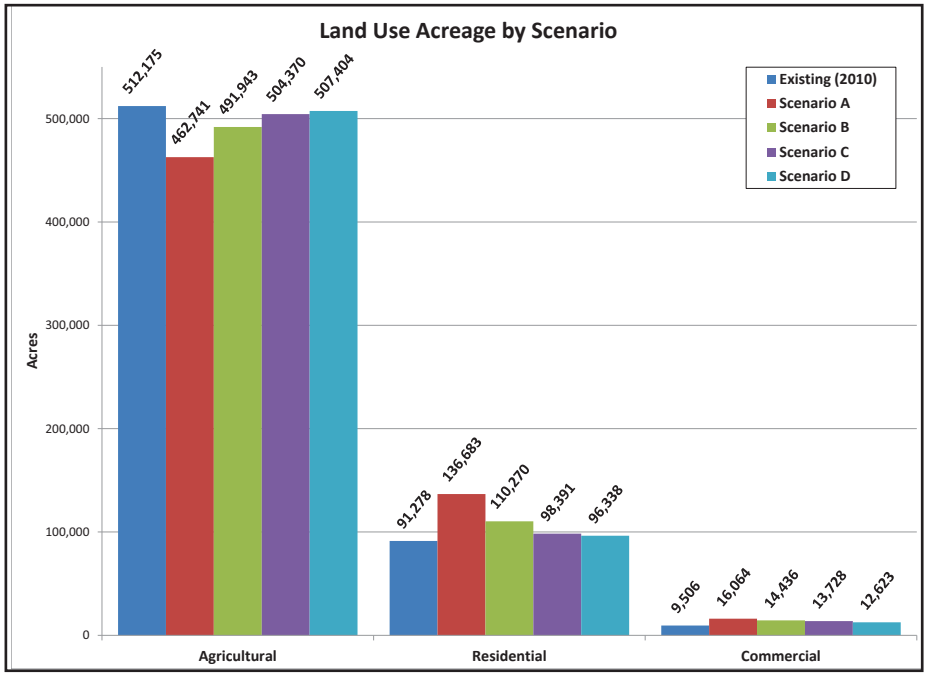


The previous five land use maps show the existing and future year scenario land uses. A comparison of the existing land use map and 2040 Scenario A land use map shows substantial differences in the western and northern portions of Vanderburgh County, the central and southern portions of Warrick County, especially between Boonville, Chandler, and Newburgh, and the areas along US 60, Zion Road (KY 351), and the Pennyrile Parkway in Henderson County. These areas include expanded low density residential and some new commercial land uses.

A comparison of the 2040 Scenario A and 2040 Scenario D land use maps show much less land consumption in Scenario D. Although there is less land consumed, the same amount of population and employment growth is occurring. Higher densities mean that less land is required for the same amount of growth, therefore less agricultural land is being consumed and less utility expansion is required.

The land use chart in Table 3-3 compares the acres used for the existing land uses and each of the four scenario land uses. The chart shows that Scenario A consumes 10 times more agricultural land than Scenario D. It also shows a 50% increase in residential acreage for Scenario A and just a 6% increase for Scenario D.

Table 3-3: Land Use Acreage by Scenario



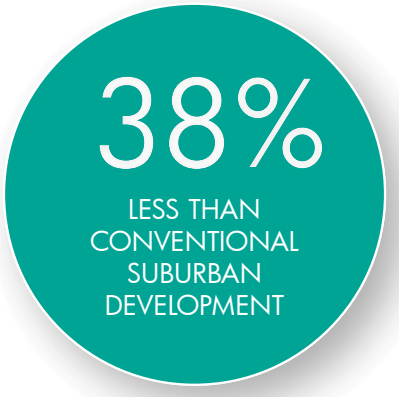
Budgetary Impact of Scenarios

Developing with higher densities and more infill is beneficial in terms of preserving farmland, cutting vehicle miles traveled, and creating more walkable and attractive neighborhoods. However, there remains a question whether suburban development creates a significant enough overall economic impact that may warrant changing how land has been traditionally developed. Studies have shown that living in a compact neighborhood reduces the amount of driving for residents of the neighborhood, which in turn reduces emissions. Compact neighborhoods also provide more opportunities to interact with neighbors. However, one of the greatest advantages of living in a dense urban neighborhood instead of a suburban development, that often goes overlooked, is the impact on municipal budgets.

Smart Growth America developed a study in 2013 called *Building Better Budgets: A National Examination of the Fiscal Impacts of Smart Growth Development*. Smart Growth America is a coalition of advocacy organizations dedicated to researching and advocating for better development strategies across the country. The report surveyed 17 studies from across the nation that compare the financial implications of different types of development.

The survey concluded that:

1. **Smart growth development costs an average of 38 percent less than conventional suburban development for upfront infrastructure,**



2. **Smart growth development saves municipalities an average of 10 percent on ongoing public services such as police, ambulance, and fire service costs, and**

3. **Smart growth development generates 10 times more tax revenue per acre than conventional suburban development.**

Smart Growth

Smart Growth America defines smart growth as follows:

> *Smart growth is a better way to build and maintain our towns and cities. Smart growth means building urban, suburban and rural communities with housing and transportation choices near jobs, shops and schools.*

Within this Regional Plan for Sustainable Development, four different 2040 scenarios were created and analyzed. Each of the scenarios had progressively more infill development. Scenario A, also known as "Business As Usual", includes approximately 5 percent infill development and continues the current trend in the region of suburban development. Scenario D includes more than 50 percent infill development, with the majority of all development located in or near existing city limits. Scenarios B and C are between these two extremes with more infill than Scenario A, but less than Scenario D.

Data outputs from HELPViz and CommunityViz were used to analyze the capital and maintenance costs and tax revenues from housing for each of these four scenarios. Tax rate information, average housing values, average costs of services, and average capital costs for new development were all used to estimate the costs and revenues associated with each scenario. These estimates were based on average housing costs from the 2010 Census and annexation studies from the City of Evansville. These estimates were compared to the Smart Growth America study to ensure that they were consistent with similarly sized regions. CommunityViz also allows these estimates to be easily changed to see what impact different estimates may make on totals. Although using different estimates changes the capital costs, costs of services, and tax revenue, the outcome was consistent; the net revenue of new housing development in the three-county region is substantially higher for Scenario D (primarily infill) than Scenario A ("Business As Usual").

Land Use Plan Impacts

Table 3-4 shows the tax revenue, the capital and maintenance costs, and the total net revenue of new housing development for each of the four scenarios between 2010 and 2040. Net revenue grows faster in Scenario D than in the other scenarios, ultimately reaching a net revenue of almost $8 million in 2040 compared to less than $0.5 million for Scenario A. (These totals are based on 2010 dollar amounts.) As mentioned previously, the extent of the difference between Scenario A and Scenario D is more important than the exact amount of net revenue for each scenario, as it is a forecast based on estimates.

While forecasts show a substantial difference between net revenue for Scenario A and Scenario D on an annual basis, the more substantial number is the accumulated net revenue over the 30 year period from 2010 to 2040. In this 30 year period, Scenario D is estimated to have a net revenue of more than 20 times that of Scenario A. Table 3-5 shows that the 30 year accumulated net revenue for Scenario A is $5.5 million while for Scenario D it is $123.5 million.

Table 3-4: Annual Net Revenue by Scenario

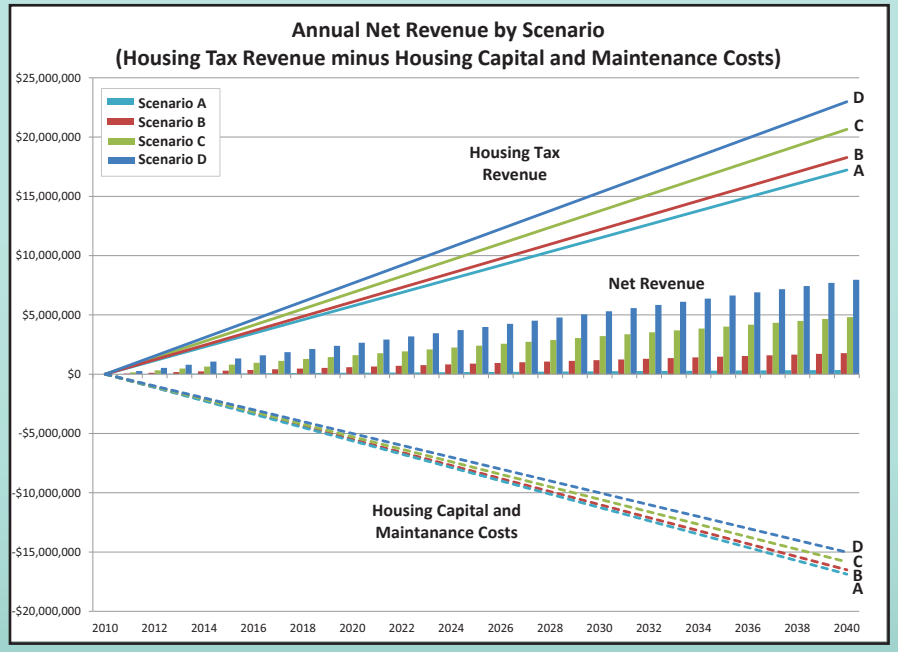
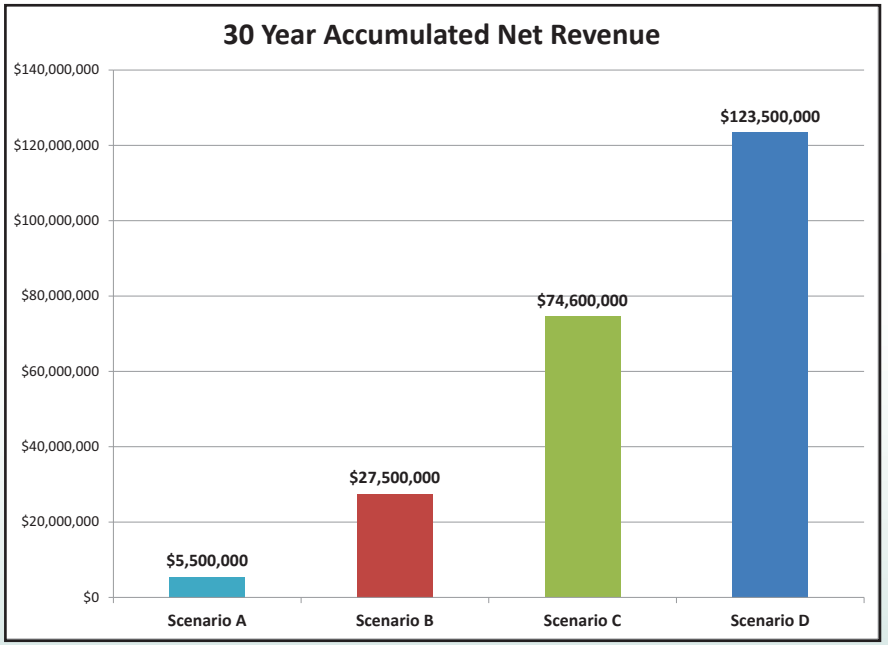


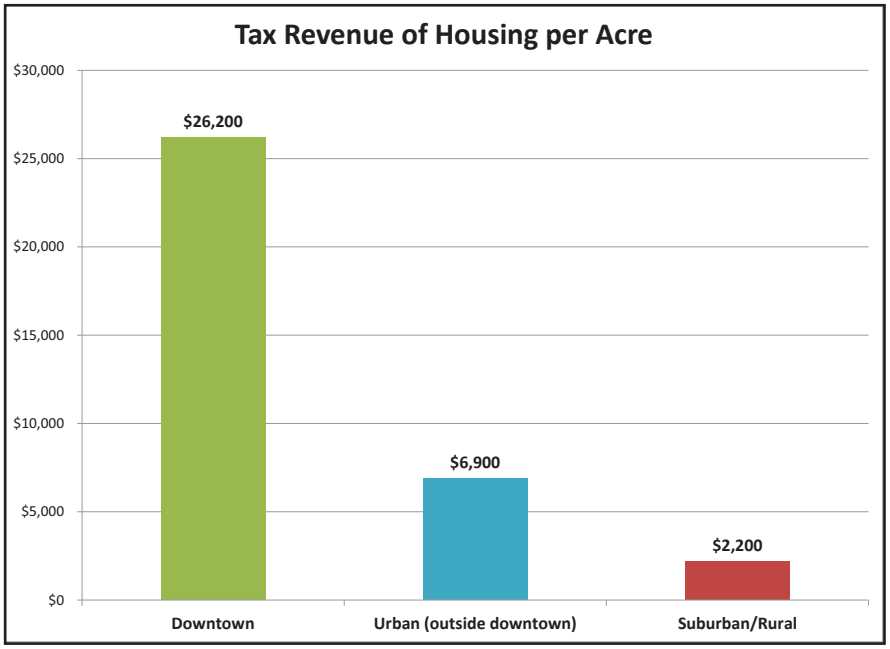
Table 3-5: 30 Year Accumulated Net Revenue



There are several factors that lead to this difference between the scenarios. First, infill development does not require the expansion of utilities as these are already in place. The estimates used in CommunityViz do include some capital costs for any necessary utility upgrades in already developed areas, but not to the extent of adding completely new water and sewer lines. Second, public services cost less to provide in compact areas than they do in sprawling areas. Third, tax revenue on each house is higher within the urban core than it is in suburban areas beyond the city limits. (Note: Taxes paid within the city limits go to both the municipality and the county, while taxes paid outside of the city limits only go to the county.)

Not only are the tax rates higher, the amount of tax revenue generated per acre is much higher in the city than it is outside of the city. This is due to the higher densities, which mean more houses are being taxed on every acre. The Smart Growth America report stated that smart growth development generates, on average, 10 times more tax revenue per acre than suburban development. Analysis using CommunityViz for the three-county region shows that tax revenue is more than three times higher in urban areas (outside of downtown) and 11 times higher in downtown Evansville and Henderson than in suburban and rural areas. Table 3-6 shows the tax revenue per acre for the three-county region.

Table 3-6: Tax Revenue of Housing per Acre



Infill Versus Green Field Development

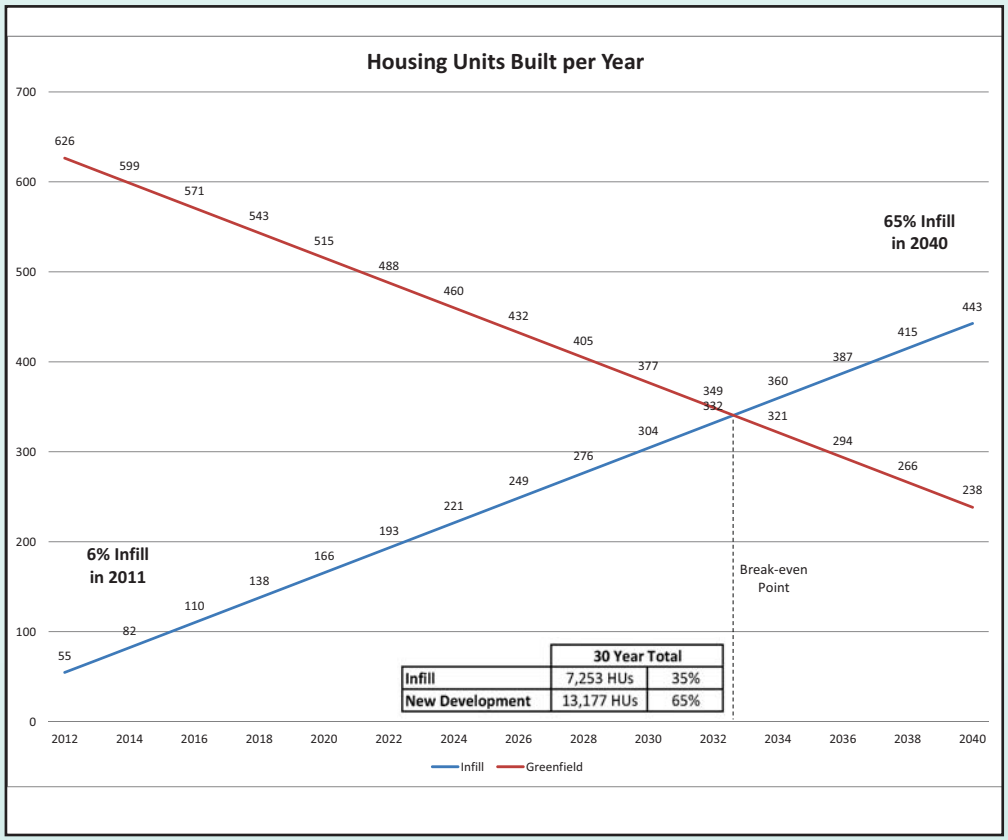
According to a report by the United States Environmental Protection Agency Office of Sustainable Communities, Evansville ranked near the bottom in the amount of infill development between 2000 and 2009. The report, titled *Residential Construction Trends in America's Metropolitan Regions: 2012 Edition*, found what percentage of new development was infill in all metropolitan areas in the U.S. over 200,000 people. Evansville ranked 195th out of 209 with 6.4% of new development being infill between 2000 and 2009. That compares to a high of 79.7% in the San Jose-Sunnyvale-Santa Clara, California Metro Area.

In all metropolitan areas in the Midwest (Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, and Tennessee), Evansville is third from last, with only Kingsport-Bristol-Bristol, Tennessee-Virginia and Clarksville, Tennessee-Kentucky having lower infill percentages between 2000 and 2009. The Chicago Metro Area had the highest percentage in the Midwest with 41.1% infill. South Bend had the highest percentage in Indiana with 38.0%. Indianapolis, Fort Wayne, and Lafayette all had between 15% and 20%. (See page 69.)

A goal should be set for the Evansville Metro Area to have a much higher percentage of infill development by the year 2040. Higher density development in the cities and towns of Evansville, Henderson, Boonville, Newburgh, and Chandler would help improve the overall infill percentage over time. While an immediate jump is impractical, a gradual increase from 6.4% infill between 2000 and 2009 to 65% by 2040 is not unrealistic. Table 3-7 shows the number of housing units built each year in infill areas and greenfield areas between 2011 and 2040 if the infill percentage gradually increases from 6% in 2011 to 65% in 2040. A linear trend from 2011 to 2040 would have a "break-even point" (where infill and greenfield development is 50-50) in 2033. When summed over this 30 year period, this trend would equate to 35% of all new development built between 2011 and 2040 being infill.


huddles
frozen yogurt
SUITE115

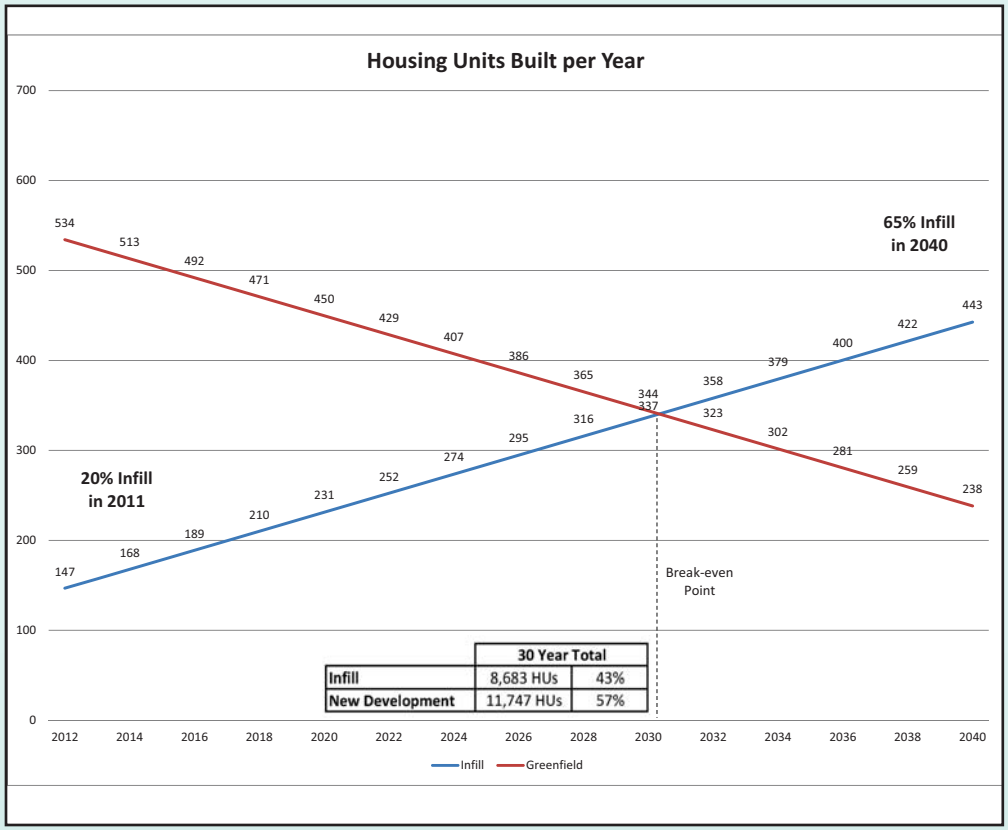
Table 3-7: 6% Infill Table



	Total Units	Infill	Greenfield	% Infill	% New
2011	681	41	640	6%	94%
2012	681	55	626	8%	92%
2013	681	69	612	10%	90%
2014	681	82	599	12%	88%
2015	681	96	585	14%	86%
2016	681	110	571	16%	84%
2017	681	124	557	18%	82%
2018	681	138	543	20%	80%
2019	681	152	529	22%	78%
2020	681	166	515	24%	76%
2021	681	179	502	26%	74%
2022	681	193	488	28%	72%
2023	681	207	474	30%	70%
2024	681	221	460	32%	68%
2025	681	235	446	34%	66%
2026	681	249	432	37%	63%
2027	681	263	418	39%	61%
2028	681	276	405	41%	59%
2029	681	290	391	43%	57%
2030	681	304	377	45%	55%
2031	681	318	363	47%	53%
2032	681	332	349	49%	51%
2033	681	346	335	51%	49%
2034	681	360	321	53%	47%
2035	681	373	308	55%	45%
2036	681	387	294	57%	43%
2037	681	401	280	59%	41%
2038	681	415	266	61%	39%
2039	681	429	252	63%	37%
2040	681	443	238	65%	35%
	20,430	7,253	13,177		
				35%	65%

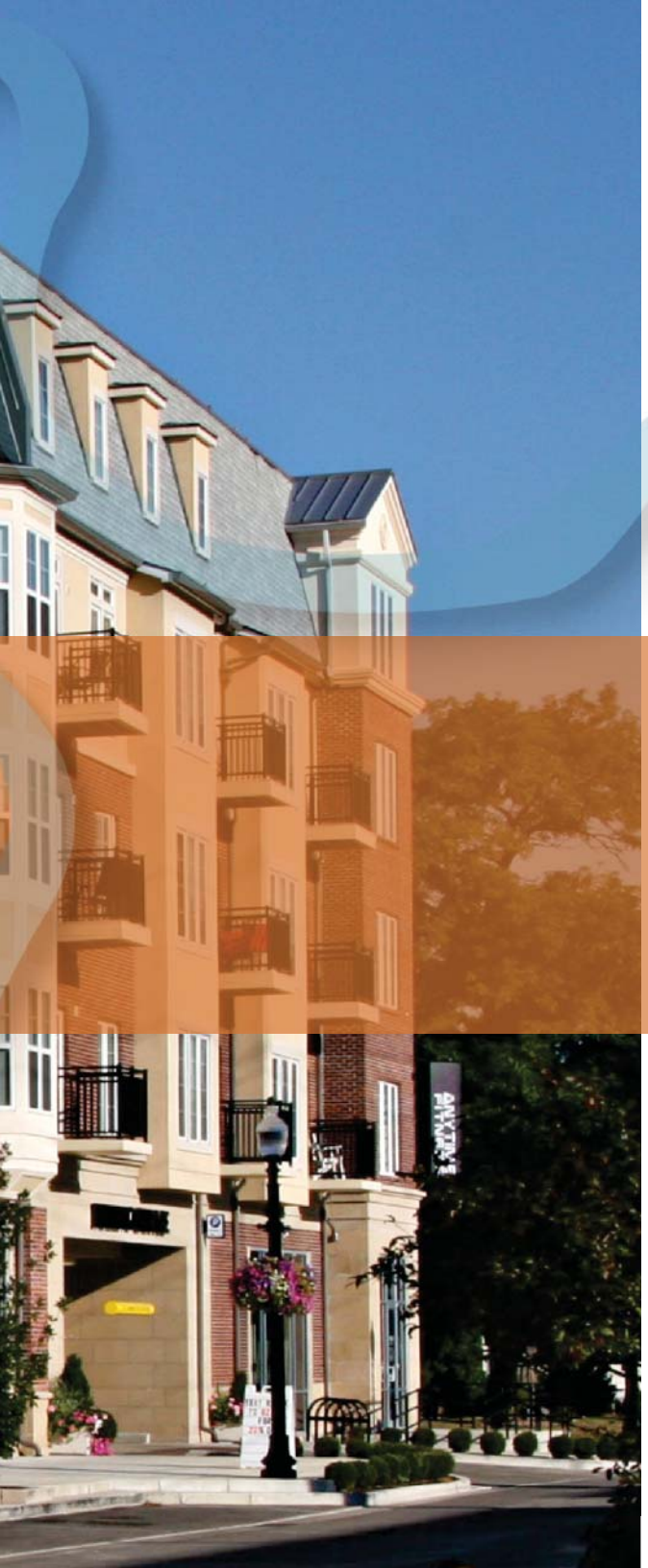
While these are achievable goals (see Table 3-7), they leave the region behind other metro areas in the Midwest. Table 3-8 shows the number of housing units built between 2011 and 2040 if the infill percentage gradually increases from 20% to 65%, as opposed to starting at 6%. The "break-even point" would then be 2031, and the overall sum of the 30 year period would equate to 43% infill. This aligns better with other metro areas than starting at 6%.

Table 3-8: 20% Infill Table



	Total Units	Infill	Greenfield	% Infill	% New
2011	681	136	545	20%	80%
2012	681	147	534	22%	78%
2013	681	157	524	23%	77%
2014	681	168	513	25%	75%
2015	681	178	503	26%	74%
2016	681	189	492	28%	72%
2017	681	200	481	29%	71%
2018	681	210	471	31%	69%
2019	681	221	460	32%	68%
2020	681	231	450	34%	66%
2021	681	242	439	36%	64%
2022	681	252	429	37%	63%
2023	681	263	418	39%	61%
2024	681	274	407	40%	60%
2025	681	284	397	42%	58%
2026	681	295	386	43%	57%
2027	681	305	376	45%	55%
2028	681	316	365	46%	54%
2029	681	326	355	48%	52%
2030	681	337	344	49%	51%
2031	681	348	333	51%	49%
2032	681	358	323	53%	47%
2033	681	369	312	54%	46%
2034	681	379	302	56%	44%
2035	681	390	291	57%	43%
2036	681	400	281	59%	41%
2037	681	411	270	60%	40%
2038	681	422	259	62%	38%
2039	681	432	249	63%	37%
2040	681	443	238	65%	35%
	20,430	8,683	11,747		
				43%	57%

Starting at 20% infill means that changes in ordinances and development patterns must be made. Home builders and developers would have to look at development within city limits as a viable option. However, it should not be difficult, as other sprawling Midwest cities were already at or near this 20% level between 2000 and 2009. Fort Wayne; Indianapolis; St. Louis; Knoxville; Rockford, Illinois; Dayton, Ohio; and South Bend all had at least 17% infill in this time period. By starting at a higher beginning point, and providing the tools necessary to increase opportunities for infill, the Evansville Metro Area should easily reach a goal of 65% infill by 2040.



Chapter 4 - Millennial Workforce and Senior Housing Plan

"A land full of places that are not worth caring about may soon be a nation and a way of life that is not worth defending."

-James Howard Kunstler

Millennial Workforce and Senior Housing Plan

Background

The Housing Plan for the three-county EMPO area is based on

1. an assessment of fair housing and the level of equity in housing location patterns and financing within the region (See Volume 4 for full Fair Housing Equity Assessment.);

2. an assessment of housing needs, referring to Chapter 3 and noting, in particular, census tracts qualifying for further federal- and state-funded programming, such as the Low Income Housing Tax Credit (LIHTC) program;

3. a suggested expansion of private-sector-provided low and moderate income housing via a TIF Set Aside provision;

4. a strategy for expanding housing location choice by evaluating the present geography of Section 8 rental voucher sites combined with a discussion of desirable locations for future affordable housing in defined “Opportunity Areas"; and

5. suggested revisions to the zoning ordinance that will aid in promoting mixed income and mixed use housing development in a variety of locations throughout Vanderburgh, Warrick and Henderson counties, near employment centers and in the core of compact neighborhoods.

The overriding purpose of the Workforce and Senior Housing Plan then, is to foster and stimulate wider housing choices for low and moderate income families in order to assist them in optimizing their family budgets when it comes to housing and transportation expenses (h + t). As stated in Chapter 3, the combined costs of housing and transportation should not exceed 50 percent of a family’s gross income.

Workforce and senior housing, as well as housing for first-time homebuyers – all growing market segments within the homebuilding industry – will require strategies that go well beyond the usual responses. Visions and prescriptions must get past cheap and distant land and lower construction quality. These strategies, so long relied upon to deliver affordable housing, no longer make sense unless they are supplemented with new, planned regional approaches. Affordable housing on "cheap" land isolates the poor; state and federal subsidies are becoming increasingly scarce; creative financing is limited in the aftermath of the bursting housing bubble; and construction quality has so often been cut to the bone, there is nowhere else to chop. Solutions to these problems, looking forward to 2040, can no longer be grounded in only the cutback mindset. Affordable housing must begin to be conceived by starting with **affordable neighborhoods and affordable infrastructure**.

In Volume 1, Chapter 3 of this report the preservation versus mobility debate was discussed. The conclusion is that housing programs and policies, both publicly and privately generated, should strive to promulgate wider choices of housing types and locations for all income segments of the regional population. Families should not be forced to either move or remain in place, without their full willingness, agreement and financial participation. Housing type and location must always be a matter of individual and family choice. There must be a balance in local housing programming between preserving urban neighborhoods and offering locational choices in suburban locations near employment centers. Establishing this balance is critical if the area is to grow, prosper and offer its citizens the housing choices they deserve.

The Department of Metropolitan Development in Evansville and the Community Development Office in the City of Henderson, Kentucky are both committed to using CDBG and HOME funds to preserve and improve urban neighborhoods located within their respective jurisdictions. The Public Housing Authorities of Evansville and Henderson are, likewise, heavily involved in providing their clients with quality housing, while expanding citizens' locational choices by (1) continually upgrading and maintaining public housing sites; and (2) offering Section 8 rental vouchers and scattered-site single family homes in a variety of locations. Communities in Warrick County, defined as a "non-entitlement" county by HUD, must have their private developers and not-for-profits work directly with the State of Indiana's Housing & Community Development Authority (IHCDA) to secure funding for affordable workforce housing programs.

This Housing Plan and also the FHEA recommendations, prepared as a part of the Sustainable Evansville Area Coalition initiative, and included in Volume 4 of this Regional Plan for Sustainable Development, encompasses the entire geography of the three-county Metropolitan Planning Organization (MPO) jurisdiction. The Housing Plan seeks to capture the vision of the various housing providers – public, private and not-for-profit – and coordinate their respective visions into a powerful and unified approach to housing opportunity and choice in the region. The Housing Plan and the FHEA recommendations seek to determine census tracts that warrant priority attention with regard to the development of low-mod, workforce and senior housing, based on qualifying factors and demographic characteristics. The defined census tracts, both in Vanderburgh and Henderson counties, comprise the focus areas for both communities and are intended to set the stage for future housing programming and funding allocations. Success in future programming for workforce and senior housing depends on both the public and private sectors joining forces to build affordable neighborhoods that are economical to live in, and economical to maintain.

Figure 4-1: Qualified Census Tracts for Evansville, IN

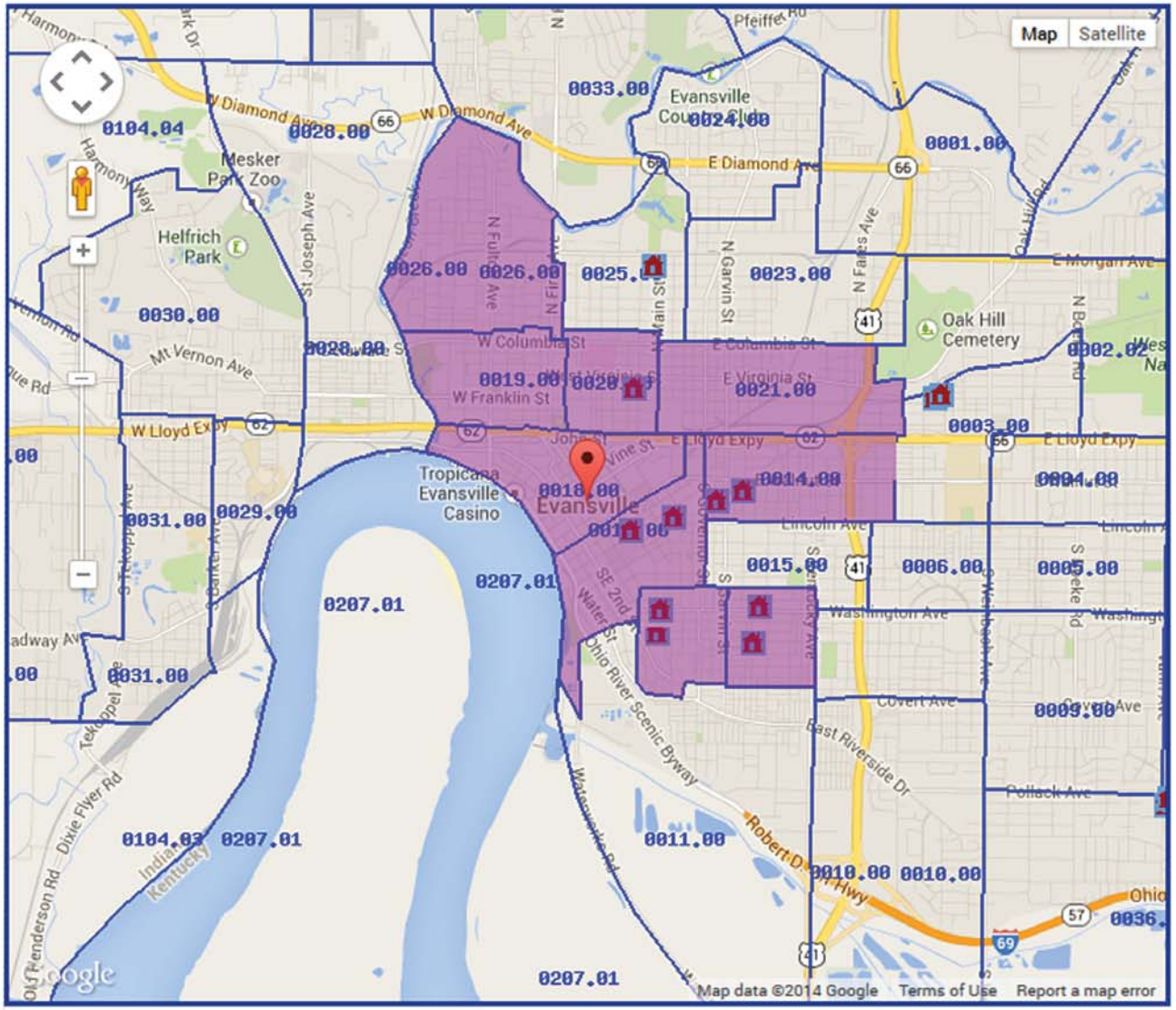
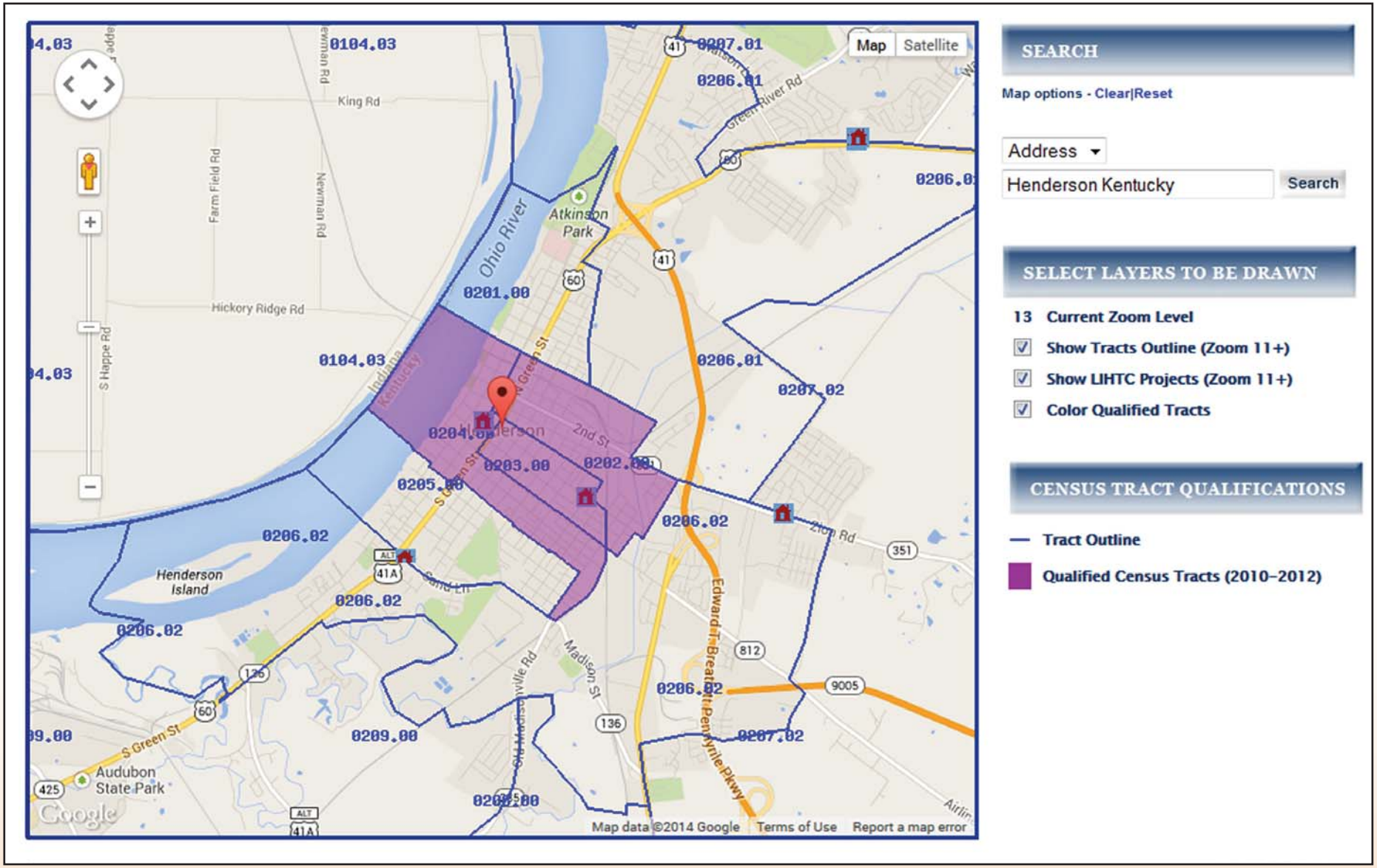


Figure 4-2: Qualified Census Tracts for Henderson, KY



Shortfall in Funding for Public Housing

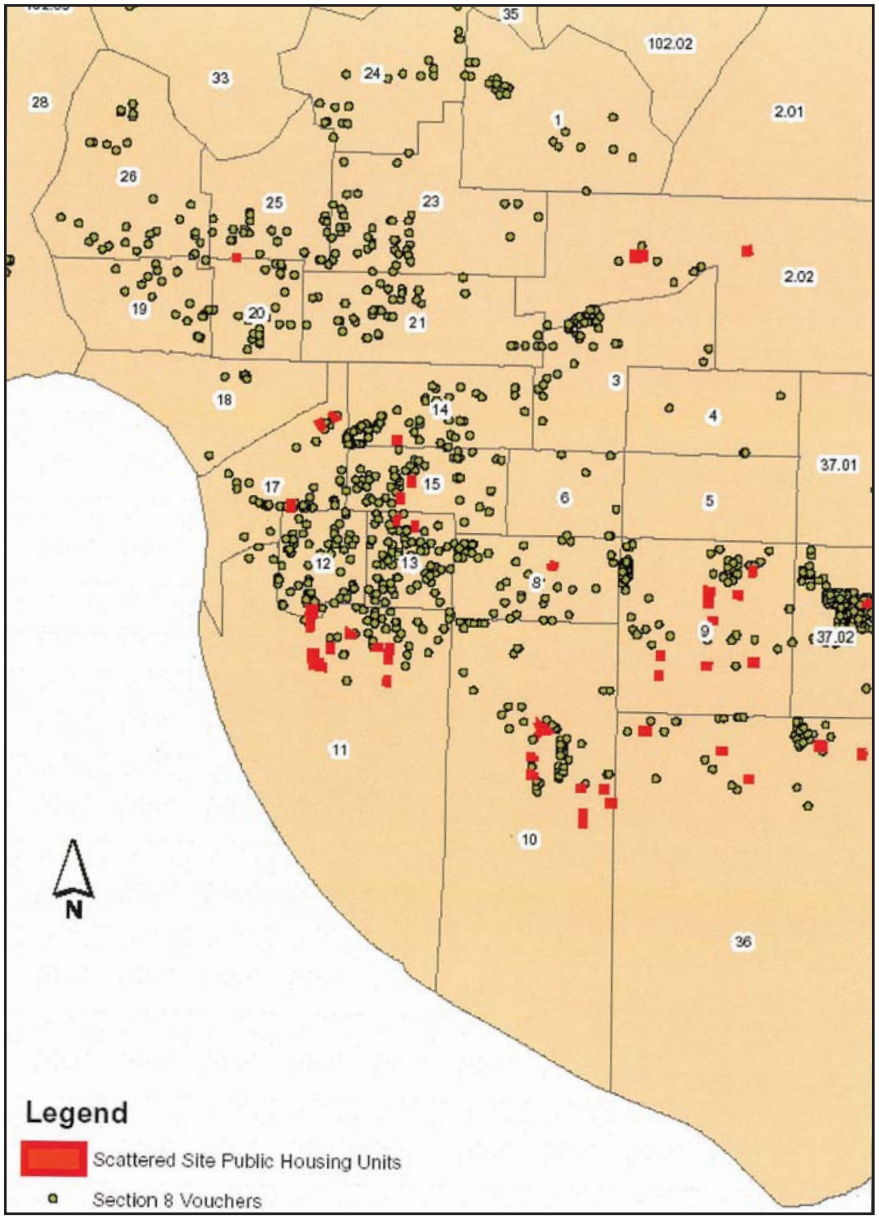
At this writing, with federal budget stalemates, sequesters, and downward trends in federal funding that date back several years, the Evansville Housing Authority is finding it difficult to maintain staffing. The EHA cut two people in 2012 and had to reassign two more people in 2013 within the agency. In fiscal 2013 the agency received only 80 percent of the money it is normally entitled to under the federal funding formula. Budget cutbacks are affecting maintenance items such as pest control and the most basic everyday repairs. Section 8 housing vouchers, normally issued to 1,900 local families who meet income requirements, were cut to 1,600 by the end of 2013. The cuts are painful when considering there are as many families on the waiting list as there are in the original allocation (close to 1,900 on the waiting list).

The Evansville Housing Authority suffered recently for being good financial stewards. In 2012, the local agency received no federal subsidy at all for its Section 8 housing program. The reason for the region receiving no voucher allocations in 2012 is, allegedly, because it had about $1.2 million in cash reserves. The agency was forced to spend down its reserves in order to receive more federal Section 8 voucher subsidies in 2013. The agency has operated leanly over the past several years, in order to build up its reserves, knowing federal funding could, at some point, be in jeopardy. But due diligence and tight budgeting have not been rewarded. [1]

Losses in state and federal funding mean, for the time being, localities across the nation will need to get creative in figuring out positive means and methods to fund and supply affordable housing for all of the families whose incomes are 80 percent or less, as compared to the Family Median Income in the metropolitan region. Since the Great Recession of 2007-2008, it increasingly appears that localities are "on their own." More intensive reliance on Not-For-Profits, Foundations, Faith-Based Organizations, and private sector housing resources has become the norm.

1 Evansville Courier and Press, "EHA delays needed repairs and upgrades," article by John Martin, front page, Sunday, October 20, 2013, martin@courierpress.com

Figure 4-3: Section 8 and Scattered Site Public Housing



Courtesy of the Department of Metropolitan Development
Evansville, Indiana

Role of Affordable Workforce Housing in Quality of Lifestyle and Area Economic Development

Affordable workforce housing is a key element of a balanced, well-rounded metropolitan community. Housing developed for households at a level that is affordable for low- and moderate-income households, preferably near schools and employment centers, and often using some form of subsidy, can make a substantial contribution to the local economy and to the economic development of the community. Development of affordable workforce housing promotes increases in spending and employment, often becomes a revenue source for local government by adding to the tax base, and reduces the incidence of foreclosures, bankruptcies and their associated costs. If communities in the region do not develop a sufficient supply of quality affordable workforce housing, employers and the overall regional economy can be at a competitive disadvantage, due to difficulties in attracting and retaining needed workers.

Research consistently shows that the development of affordable workforce housing creates economic value and regional jobs – both during construction and later through consumer spending that would otherwise have been consumed in households' housing and transportation costs. A report published by the National Association of Home Builders in 2010 details the economic/jobs impact of building one hundred units of Low-Income Housing Tax Credit housing for families in a typical metropolitan region using national averages for inputs. The NAHB estimates that building one hundred new LIHTC units, on average, leads to the creation of 80 jobs related to construction and 42 jobs by the effects of family spending. [2] Table 4-1 reflects jobs created by three different multi-family properties. The Tax Credit project is virtually equal to the market rate apartment development in its ability to generate jobs.

2 "The Role of Affordable Housing in Creating Jobs and Stimulating Local Economic Development: A Review of the Literature," by the Center for Housing Policy, with Support of the MacArthur Foundation, authored by Keith Wardrip, Laura Williams, and Suzanne Hague [intern], January 2011

In Montgomery County, Indiana local business leaders claimed that the county's workforce did not have the needed skills to fill available area jobs. Upon examining the demographic profile and socioeconomic characteristics of the Montgomery County workforce in 2003, Drew Klacik found the claims to be unfounded. His analysis showed that the problem is workforce quantity – not quality – that was hindering the local economy. Klacik showed that the county was an importer of workers, and he attributed the shortage of workers to the minimal housing production and housing prices that are not commensurate with available local wages. Mr. Klacik's conclusions and their implications are very clear. By providing more affordable housing stock, the county could foster a situation wherein its qualified workers could reside near Montgomery County's employment opportunities, which would likely make the county's business and industrial sector more productive, resilient and profitable. [3]

Table 4-1: Jobs Created by 100-Unit Multifamily Project

	Family LIHTC	Senior LIHTC	Market-Rate Apartments
Jobs Created Directly and Indirectly by New Construction	80	75	80
Jobs Supported by Spending Locally Earned Wages (Induced)	42	39	42
Jobs Supported by Households Occupying New Homes (Ongoing)	30	32	32

Source: National Association of Homes Builders, 2010 and 2009a

3 "Affordable Housing Key to Economic Development, in Central Indiana," by Drew Klacik, Indianapolis, IN: Center for Urban Policy and the Environment, July 2003

Existing Affordable Workforce Housing Neighborhoods

Henderson and Evansville are endowed with affordable workforce housing neighborhoods providing housing stock that was, at one time, near urban blue-collar employment. Many of the manufacturing jobs, and industries that provided them, have either gone out of business or moved to more remote suburban locations. Residents of the affordable workforce housing neighborhoods shown on the accompanying map of Evansville (Figure 4-4) often must drive to jobs at these remote suburban locations, requiring increasing family transportation costs associated with gasoline price escalation and automobile maintenance.

Figure 4-4: Evansville Core Affordable Workforce Housing Neighborhoods

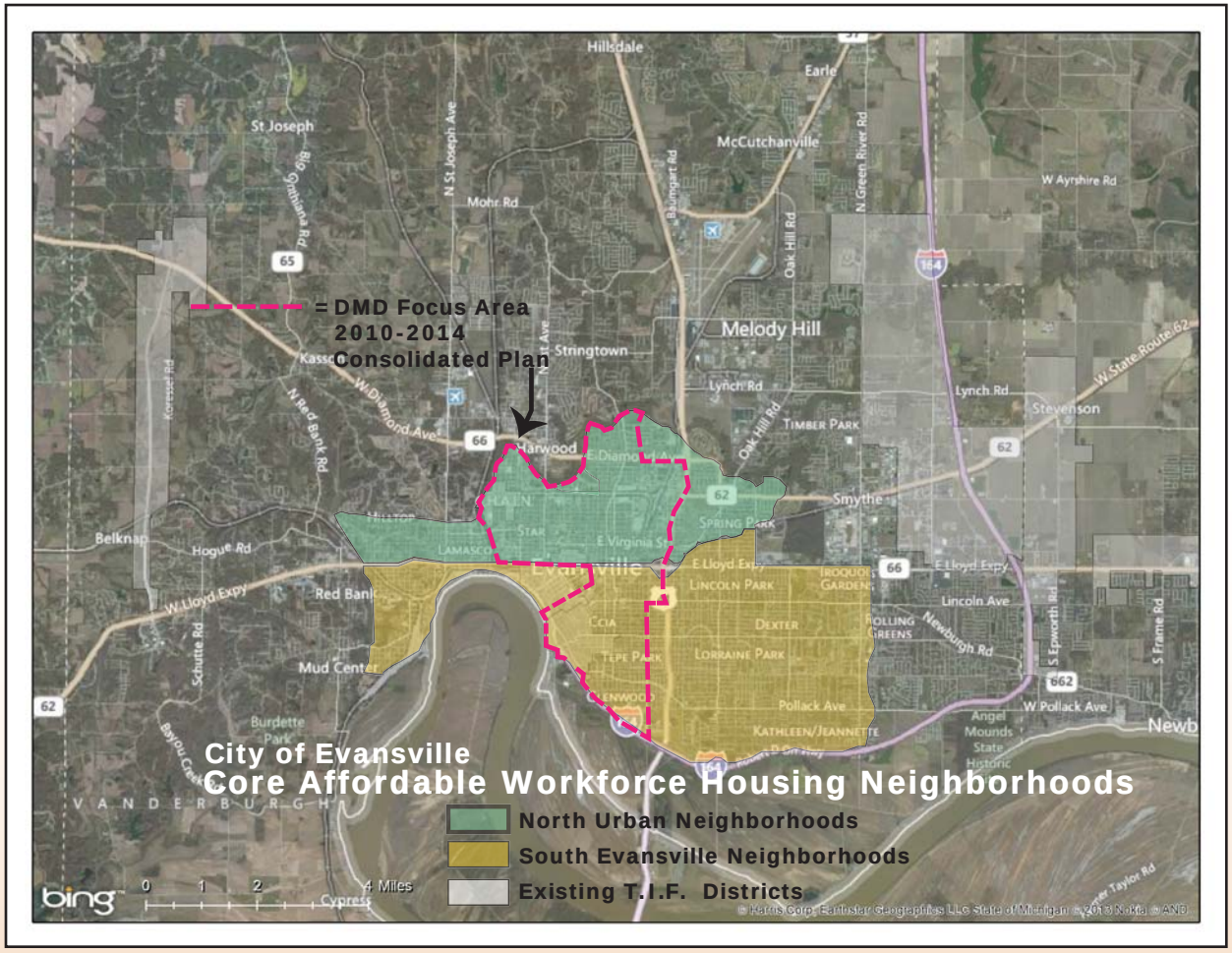
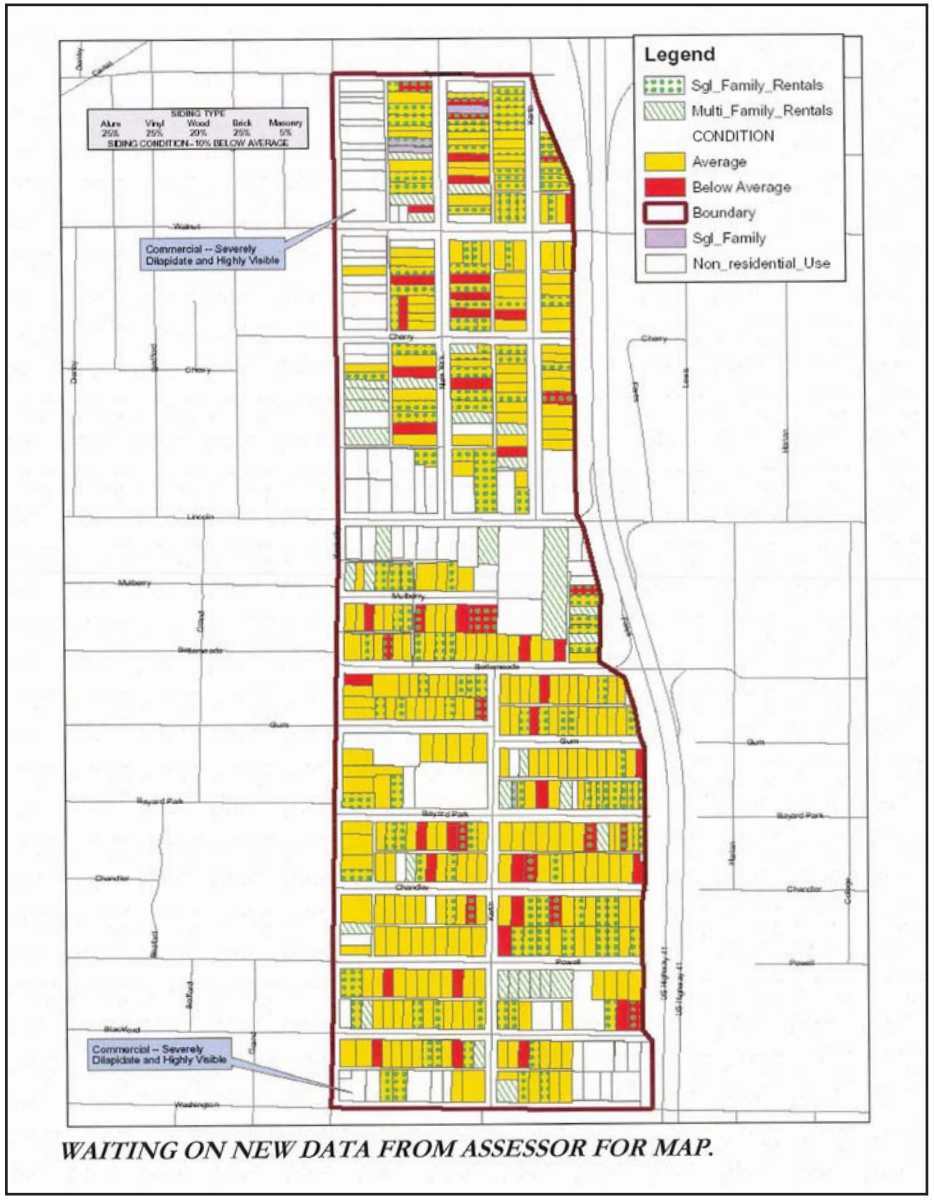


Figure 4-5: Windshield Housing Condition Survey of 47713



Courtesy of the Department of Metropolitan Development
Evansville, Indiana

In Volume 1, Chapter 3, the state of urban housing markets in Henderson and Evansville was examined. It is clear that housing stock in these communities built prior to 1960 is being lost at an alarming rate, while vacancies continue to mount. Estimates are as high as 50% for annual losses of low and moderate income housing units, excluding public and private efforts to replace or rehab them. Vacancy rates in the Pigeon Township area of urbanized Evansville (zip code 47713) have exceeded 15% over the past decade, with over 50% of the housing stock in this area built prior to 1949. The City of Evansville estimates that there has been a total investment of $54 million of private and public housing funds and neighborhood infrastructure improvements within the corporate limits of Evansville during the period of 2010 to 2014. The area targeted by the Department of Metropolitan Development to receive the lion's share of aid and public subsidies, still has little or no private housing development due to lack of market demand and risk of investment losses.

Housing Affordability Inside the Evansville City Limits

The City of Evansville (inside its corporate limits), in an international ranking (including Australia, Canada, Ireland, New Zealand, the United Kingdom, the United States and Hong Kong) of housing affordability in 337 housing markets in 2011, was classified as the fifth most affordable housing market in the world. Table 4-2 shows the rankings. Housing affordability can be viewed as a double-edged sword. While good for renters and homebuyers looking for bargains, affordability can also be attributed to down-trending property values in many urban neighborhoods. To quote from the 2011 *Demographia* survey report:

> *"Among smaller markets, the most affordable were concentrated in the industrial heartland, where there have been significant employment losses during the period surrounding the Great Recession. A number of these markets had Median Multiples under 2.0, including Saginaw, MI; Flint, MI; Youngstown, OH-PA; Lansing, MI; and* **Evansville, IN**." [4]

Table 4-2: Housing Affordability Ranking

Housing Affordability Ranking: International Rankings Using Median Multiple (Median House Price Divided by Median Household Income) ------ for 2010 - 3rd Quarter

International Affordability Ranking	Metropolitan Market	Median Multiple	Median Price	Median Household Income
1	Saginaw, Michigan	1.6	$61,400	$39,500
2	Flint, Michigan	1.7	$70,700	41,700
3	Youngstown, Ohio (PA)	1.7	$70,700	41,200
4	Lansing, Michigan	1.8	$86,600	48,000
5	Evansville, Indiana	1.9	$88,800	46,800

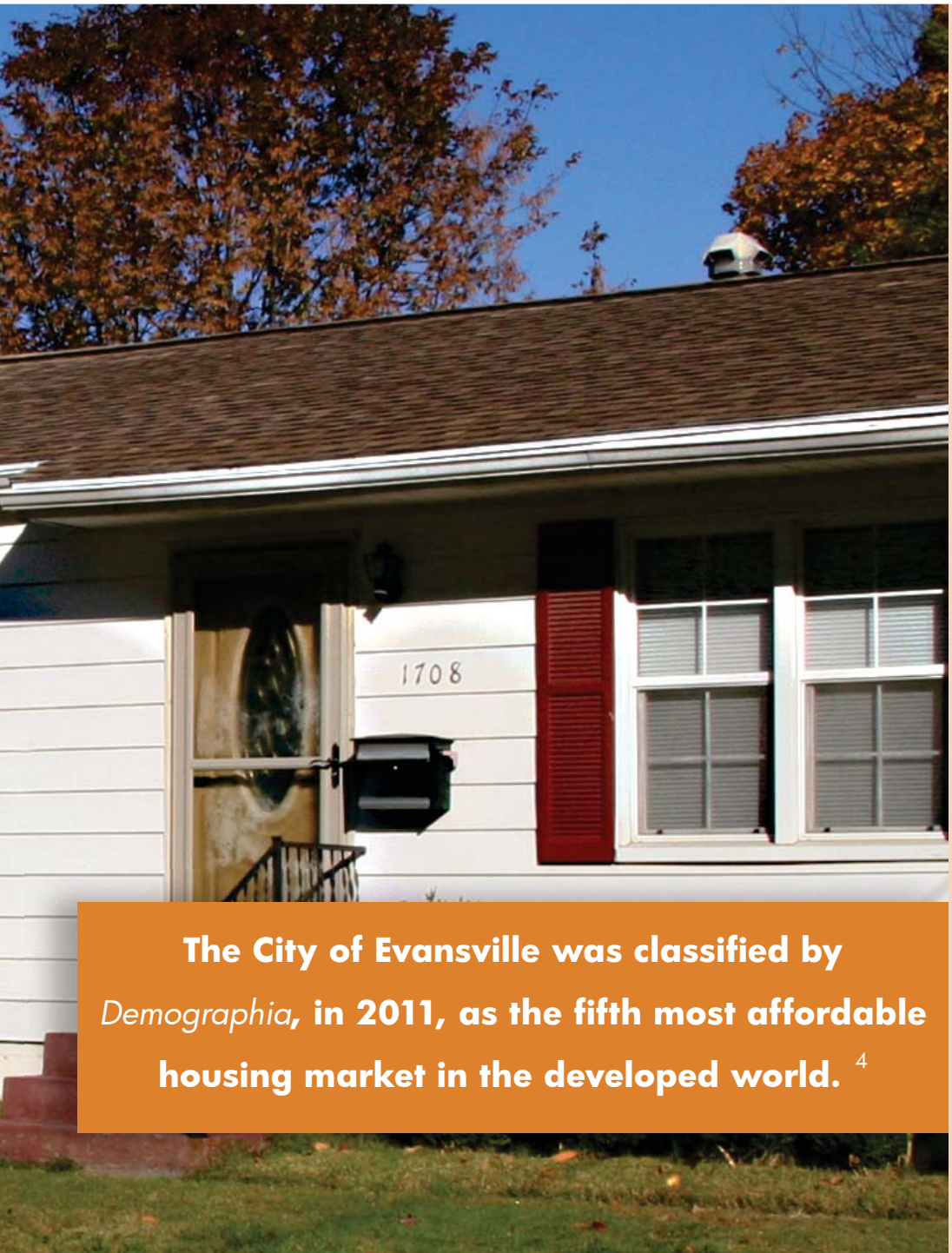
It is evident that the other four in the top five most affordable markets have suffered manufacturing job losses and are generally considered to be "Rust Belt" cities. In some neighborhoods, housing may be affordable because no one wants to live there, or the housing is in general ill-repair and has lost value over time.

The calculation mentioned above, by *Demographia*, is area Median House Price divided by area Median Household Income. In this calculation, Evansville's House Price was $88,800 (2010/3rd quarter) and its Median Household Income was $46,800 (2010/3rd quarter) for a Median Multiple calculation of 1.9, which is very affordable. Any calculation below 3.0, in the *Demographia* methodology, is considered affordable. These figures, of course, depict affordability for middle income households. Those with household incomes well below the median may find difficulty locating housing that is "affordable."

Utilizing the *Demographia* definition of affordability, housing within the corporate limits of Evansville is "affordable" for those whose income does not fall below 63.3 percent of the Median Household Income, inside the corporate limits of Evansville. At the level of 63.3 percent of Median Household Income, which amounts to an annual income of $29,625, the Median Multiple calculation is 2.997. As mentioned, anything under 3.0, in this formulation, is considered affordable.

The 2011 survey report attributes skyrocketing housing prices nationally to "more restrictive land use regulations that have virtually prohibited new house construction on or beyond the urban fringe." It found that housing unaffordability was particularly evident where there are "urban containment" measures, such as urban growth boundaries. [4]

4 "7th Annual *Demographia* International Housing Affordability Survey: 2011/Ratings for Metropolitan Markets" by Performance Urban Planning and Wendell Cox Consultancy, authors: Wendell Cox, Hugh Pavletich, and Joel Kotkin, P.O. Box 841, Belleville, Illinois 62269



The City of Evansville was classified by *Demographia*, in 2011, as the fifth most affordable housing market in the developed world. [4]

Housing affordability can be both a blessing and sometimes a curse. In Henderson, Kentucky as well as Evansville, Chandler, and Boonville, Indiana affordability may be offset by higher family transportation costs as jobs move away from urban areas to more remote suburban locations. As mentioned previously, housing affordability in the urbanized areas of the region can also be attributed to the age of the housing stock and its deteriorating conditions. In deteriorating neighborhoods, city officials have to make the decision whether the neighborhood has meaningful traditions, clusters of historic buildings, proximity to employment opportunities, or other cultural assets that make it worth improving and saving. If not, officials may make a decision to "let the neighborhood go," and as the city experiences population loss, to bulldoze and turn forsaken neighborhoods into urban forest preserves, urban agriculture sites, urban open spaces, urban wetlands, or other types of low-maintenance land uses. This prescription may sound harsh, but all cities go through periods of transition and adjustment when value judgments about the use of scarce resources must be made.

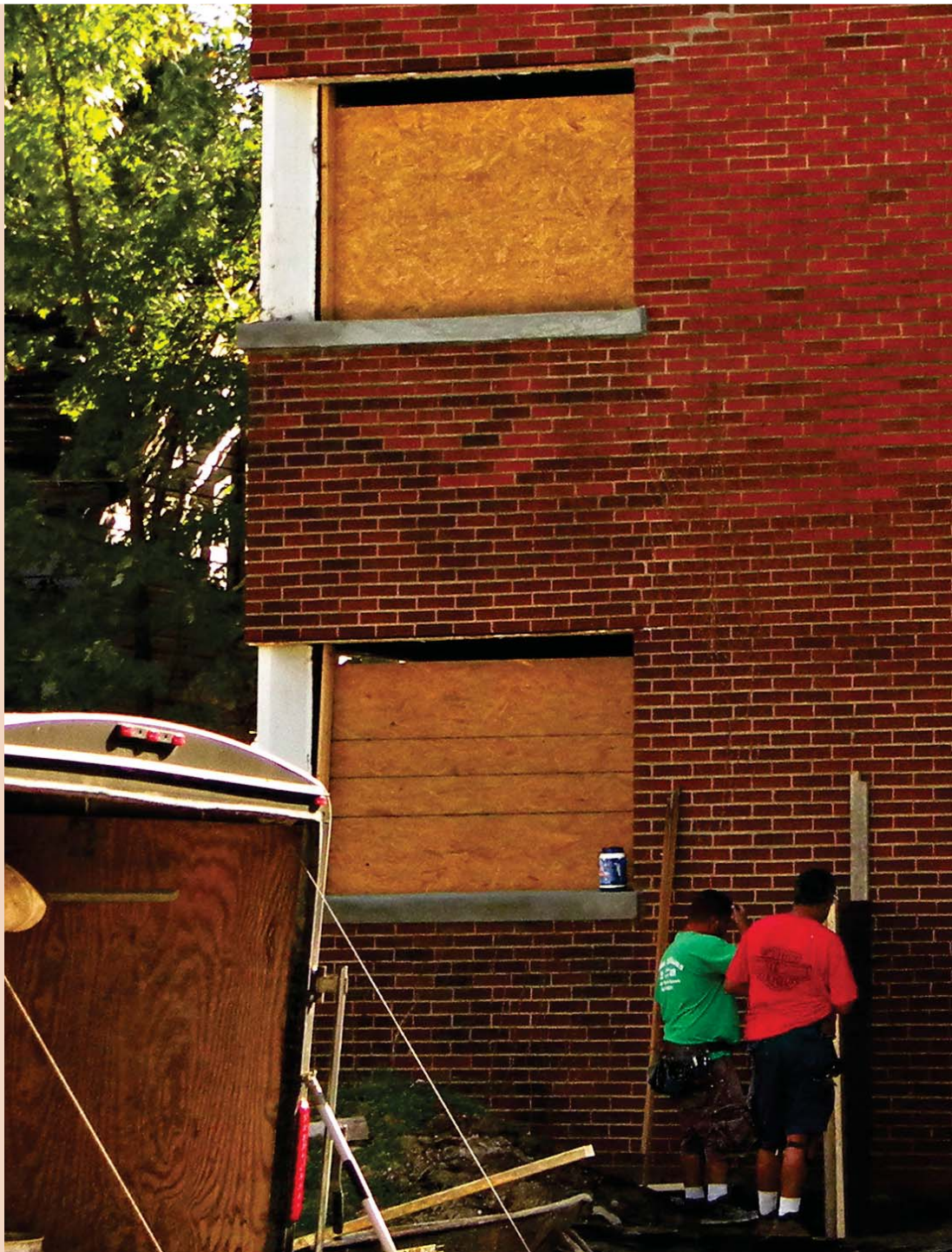
Where neighborhoods inside the Evansville and Henderson corporate limits are judged to be worth saving, stringent programs for land banking and intensive renovation and reconstruction are called for. A meaningful source of financing these improvements will be mandatory. Innovation and industrious application of care and dutiful attention will be necessary to save neighborhoods at risk of further deterioration.

Foreclosures and Delinquencies

The Great Recession in the United States has ended up leaving over 8 million homes in foreclosure in America, with millions more teetering on the edge. [5] Based on data from the Local Initiatives Support Corporation (LISC), the Evansville MSA had a foreclosure rate of 5.8% and a serious delinquency rate of 8.8% in December of 2011. The serious delinquency rate measures foreclosed homes and mortgages that are 90 or more days delinquent and have not yet entered into judicial or non-judicial foreclosure. The 8.8% delinquency rate puts the Evansville MSA into the top 30% of all MSAs in the United States for foreclosures and delinquencies of 90 days or more. Homes with mortgage delinquencies are likely vacant and may be dilapidated. Or they may also be owned by absentee owners who do not occupy the property. These absentee owners often have no intention of renting or selling their property and may leave the home in disrepair. Foreclosures, vacant and dilapidated homes, and homes owned by absentee owners are located throughout the region. However, concentrations of these homes are usually found in older urban neighborhoods.

In order to hold down the number of delinquent or foreclosed homes sitting empty in urban America, the federal government, through the states, has authorized bulldozing many of the empty houses in urban neighborhoods. Grants are, as of this writing, available to local agencies who can identify community entities, private or not-for-profit, who will take responsibility for vacant land, once demolition is undertaken. Cities' bids for federal demolition funds must come with clearly delineated end uses for targeted properties, along with specific designated program partners. In 2014, the cities in the State of Indiana will compete for a portion of the $75 million the state is making available. State officials wish to see demolition of between 3,000 and 5,000 of the state's worst blighted and abandoned structures.

5 *The Betrayal of the American Dream*, by Donald L. Barlett and James B. Steele, published by PublicAffairs, member of the Perseus Books Group, 2012/2013




HOMES OF EVANSVILLE
Financed, Developed and Designed By:
the NRP group LLC
STRUCTUREPOINT
energydivision
usbank
ihcda
CONTEXT
HOPE
REDSTONE EQUITY PARTNERS
RDL ARCHITECTS
HOMES OF EVANSVILLE
NRP CONTRACTORS, LLC
ADDRESS: 17 WARRINGTON
PERMIT: 19025/14/6
PLAN: R43
HOUSE TYPE: 4
LEASING INFO: 888-903-91

Metropolitan Land Bank

Land Banking as a Strategic Initiative

Both Indiana and Kentucky have enabling legislation and statutes that provide for localities to set up land banks. Land banks exist in Indianapolis, Indiana and Louisville, Kentucky. The cities of Evansville and Henderson need to examine the statutes and make a commitment to strong land banking campaigns for a variety of purposes. If the state enabling legislation is not strong enough to provide effective land banking practice, then Evansville and Henderson will need to work with their state legislators to lobby for stronger land banking provisions.

Strategic land banking policy and execution can help Evansville and Henderson in several ways. A metropolitan land bank could:

- **Collect** vacant lots for greening and ownership transfer;
- **Acquire** contiguous, vacant, dilapidated housing in order to demolish and assemble larger tracts that may be of value or interest to private developers, stimulating neighborhood redevelopment;
- **Mitigate** and re-purpose brownfield sites and industrial legacy properties, making large tracts available to craft industry and start-ups;
- **Assemble** open space tracts by acquiring, clearing, mitigating and greening, adding to open space and recreational amenities in urban areas, or adding urban food sources.

Case Study: Flint, Michigan

While Evansville, Indiana was achieving the status of being the fifth most affordable city in the International Affordability Ranking by *Demographia* in 2011, Flint, Michigan achieved the dubious distinction of being in second place. Flint, Michigan, birthplace of General Motors, has seen closings in auto-related industries and light parts assembly plants along with steady population decline as families have left in search of jobs, leaving behind vacant and abandoned housing. Michigan land bank enabling legislation allows their land banks to recapture 50 percent of property tax revenues for the initial five years after transfer of property to a private entity, providing an ongoing revenue stream.

In Genesee County where Flint, Michigan is located, the county can use revenue generated from selling foreclosed properties to create what is called a "land reutilization fund," helping the city and county to manage their housing inventory. The state enabling laws have also helped streamline the foreclosure process itself, allowing local authorities to reclaim declining tax-delinquent properties in less than three years.

In 2003, Michigan also adopted a key piece of law called the Land Bank Fast Track Act (Public Act 258). This Michigan Law is considered to be the most effective and advanced land banking legislation in the nation. It helps create city and county land bank authorities that have the power to assemble, redevelop, or sell a large number of tax-foreclosed properties in a very expeditious manner. Another important aspect of Michigan enabling legislation is that it also allows jurisdictions in Michigan to adopt a brownfield redevelopment plan for tax-foreclosed properties, facilitating the use of TIF for redevelopment. [6]

6 *"Revitalizing Foreclosed Properties with Land Banks,"* U.S. Department of Housing and Urban Development, Office of Policy Development and Research, by Sage Computing, Inc., Reston, VA, August 2009

In recent years, Genesee County's land banking efforts in Flint, Michigan's neighborhoods have transferred 700 vacant lots for "side yards." Also, 90 affordable rentals and 80 new single-family homes have been reconstructed. Plus the land bank's demolition program has increased local home values. A recent study conducted by the University of Michigan found that the $3.5 million investment in demolition in Flint, over a period of three years, resulted in an increase in property values, in the neighborhoods surrounding the demolitions, of more than $112.5 million. [7]

Flint, Michigan's Side Lot Transfer program makes vacant lots available to adjacent owner-occupied residential property holders who are physically contiguous to the vacant lot, with a significant (75 percent or more) common boundary line. The program helps place vacant properties back on the tax rolls. The Flint Side Lot Transfer Program mandates that homestead property owners, who acquire side lots in the transfer, may not sell their side lots for a minimum of five years. The Genessee County land bank sponsors ten programs: Adopt-a-Lot, Brownfield Redevelopment, Clean and Green, Demolition, Development, Foreclosure Prevention, Housing Renovation, Planning and Outreach, Sales, and Side Lot Transfer.

Metropolitan Land Bank

RECOMMENDATION: *The public sector can give strong encouragement and assistance to private development and neighborhood revitalization efforts by acquiring key properties, assimilating key development blocks, and preparing raw or reclaimed land for prime development by the private sector. The Evansville Brownfields Corporation has been active in the acquisition and transfer of properties in the Haynie's Corner area over the past several years. This organization actively seeks vacant and abandoned properties in the Department of Metropolitan Development's focus area in order to remove blight and stabilize contiguous urban neighborhoods. The impact of their efforts to acquire underutilized parcels and demolish dilapidated buildings, as well as to rehabilitate structures, whenever and wherever possible, is evident in the emerging resurgence of the Haynie's Corner Art District. Addressing urban blight and establishing reuse strategies in older neighborhoods is critical to the sustainability and rebirth of the urban areas of the region.*

The Evansville Brownfields Corporation functions much like a land bank, but on a smaller scale. Land banks typically enhance the objectives of code enforcement, assist in the management of property tax delinquency, and facilitate development of adaptive reuse strategies. With expanded funding, additional staff, and changes in present Brownfields Corp. bylaws, the Evansville Brownfields Corporation could easily transform into a county-wide or even a two-county metropolitan land bank. These changes would allow the present entity to address blight in a much wider geographic area than it presently operates. A metropolitan land bank could assist with sustainable projects such as community gardens, urban orchards, regional parks and open space, and other sustainable community initiatives and assets. The ongoing, active functioning of a metropolitan land bank could help optimize quality of life and economic development, while preventing devaluation of residential properties going through challenges in older neighborhoods. The metropolitan land bank could become indispensable in helping grow the tax base by assembling contiguous properties for residential, commercial and mixed-use development. The City of Evansville and surrounding counties should explore the possibility of a Metropolitan Land Bank.

7 "*Restoring Prosperity: A Roadmap for Revitalizing America's Older Industrial Cities,*" HUD and the Brookings Institution's Metropolitan Policy Program

Low Income Residents and Utility Costs

A 2001 Study called "The Cold Facts: The First Annual Report on the Effect of Home Energy Costs on Low-income Americans" found that "the average low-income family spends about one in five of their dollars on home energy costs every year." That means that a family that makes $50,000 a year pays $10,000 annually to heat their home and cook their meals. [8] Green building and energy-efficiency strategies can help low income families pay for necessities such as food, transportation costs, and education-related expenses.

Restoration, Retrofitting, and Weatherization: Sustainable Affordable Housing Strategies

In the urbanized areas of Evansville and Henderson that are experiencing population loss and building deterioration, key strategies will ultimately consist of repair, maintenance, and modernization. Demolition may be the only recourse when dilapidated homes are too far gone to be economical to rehabilitate. It is often more economical to demolish and build new on the same site. However, given the age of urban housing in the region, oftentimes repair, maintenance, and refurbishing of existing housing stock are sorely needed….often more needed than building more new housing, particularly in declining neighborhoods where residents have begun to move out.

Weatherization programs, like the one conducted in the Glenwood Neighborhood in Evansville in 2011-2012, can be important affordable housing strategies. In Glenwood, Vectren teamed with Habitat of Evansville to conduct over 80 weatherization improvements in more than 80 single-family homes. This type of program is an example of a sustainability initiative that can help low and moderate income families save on their monthly utility bills while upgrading the neighborhood and reinforcing property values.

8 *"Green Goes Mainstream in Low-Income Housing: Energy-efficient buildings aren't only for the rich,"* by Lauren Fuhry and Walker Wells, AICP, in Planning Magazine, The Magazine of the American Planning Association, 205 N. Michigan Ave., Suite 1200, Chicago, IL 60601, November 2013

Setting up a City-Scale Energy Efficiency Retrofit Program can help low and moderate income families save on their utility bills, can cut city-wide production of greenhouse gases, and can provide needed jobs. The City-Scale Retrofit Program has four key components:

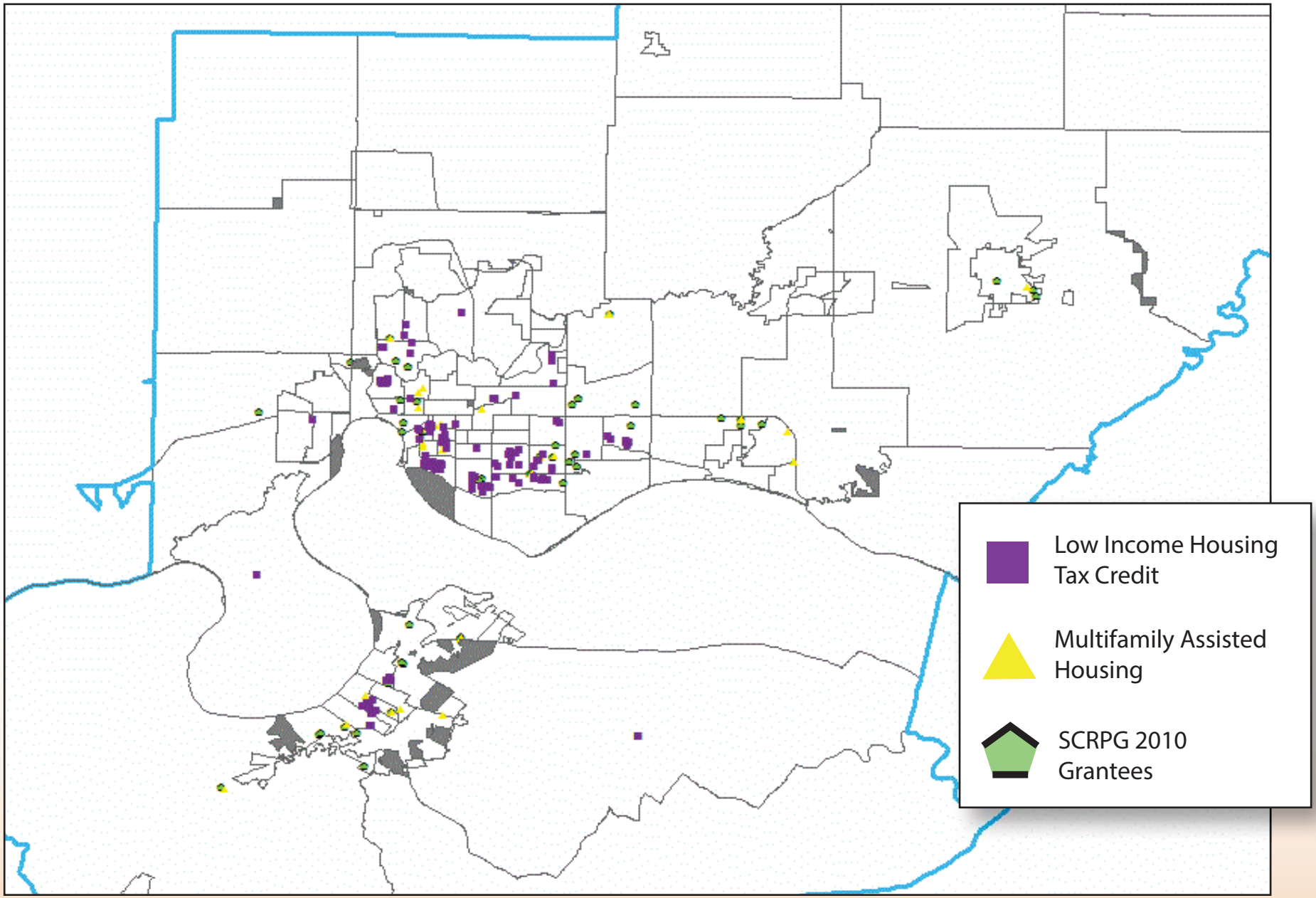
1. a means of capturing financial savings resulting from energy efficiency improvements and using them to pay for the retrofits so the program is accessible to all and is sustainable over time;
2. a focus on job quality and training so jobs created can be good-paying jobs that provide on the spot training for career pathways;
3. a scope that includes doing the energy–efficiency work on a city or regional basis to achieve economies of scale; and
4. a commitment to targeting the program to low-income communities, both in terms of the work's geographic location, as well as its selection of the persons hired to do the work. [9]

An important impetus to energy and cost savings can be achieved by including Vectren and its Conservation Connection rebate program for household and business energy savings. Substantial savings can be made by involving Vectren in the City-Scale Retrofit Program described above and utilizing its rebate offerings to assist with quicker payback and less onerous financing requirements.

RECOMMENDATION: *Cities of Evansville and Henderson should consider developing a revolving rehabilitation loan fund, in partnership with a consortium of local financial institutions, geared to rehabilitation and weatherization improvements in low-mod urban neighborhoods. Loans would be made to individual families if they are agreeable with getting involved in the City Scale Energy Efficiency Retrofit Program.*

9 *"A Short Guide to Setting Up A City-Scale Retrofit Program,"* by Stacy Ho of Green for All, Oakland California (www.greenforall.org/community-of-practice) and Satya Rhodes-Conway of The Center on Wisconsin Strategy, Madison, Wisconsin (www.cows.org)

Figure 4-6: Regional Sites Utilizing Housing Assistance



Fair Housing Near Employment

Fair Housing and Equity Assessment (FHEA)

The federal department of Housing and Urban Development and the Sustainable Communities Network, a consortium of HUD, EPA and DOT have provided an enhanced methodology for assessing fair housing practice and level of equity in the housing market for urban areas in the United States. (See Volume 4 of the SEAC documentation reports for the full FHEA.) Fair Housing and the opportunity to locate near quality schools and plentiful jobs is fast becoming the main urban/suburban issue of the 21st century.

Studies have shown that low income urban families fare much better in mixed-income neighborhoods, which usually provide access to better schools and less crime. [10] The current system of using the private market for rent vouchers and tax credit projects has not been pervasive enough to truly address the low-mod housing crisis in America. To quote Vishaan Chakrabarti in his book, *A Country of Cities*:

> *"The central problem with the current system….is the low amount of affordable housing it produces, despite the high amount of subsidies required. Often ranging in hundreds of thousands of dollars per unit produced, the subsidy levels used in current affordable-housing production are unsustainable without decreasing costs, increasing overall [direct] government funding for affordable housing, or both."* [11]

One solution to this dilemma involves direct developer incentives built into the county's zoning and land use control system. The goal should be a minimum of five (5) percent affordable units in any multifamily project of thirty (30) units or more. (See Chapter 7 for recommendations on changes to the zoning ordinance.) Figure 4-6 shows the locations where Section 8 housing rental vouchers are currently being used.

10 "Massive Housing Experiment Finds Those Who Moved to Less-Impoverished Neighborhoods Were Happier," by Carolyn Y. Johnson, Boston Globe, September 20, 2012

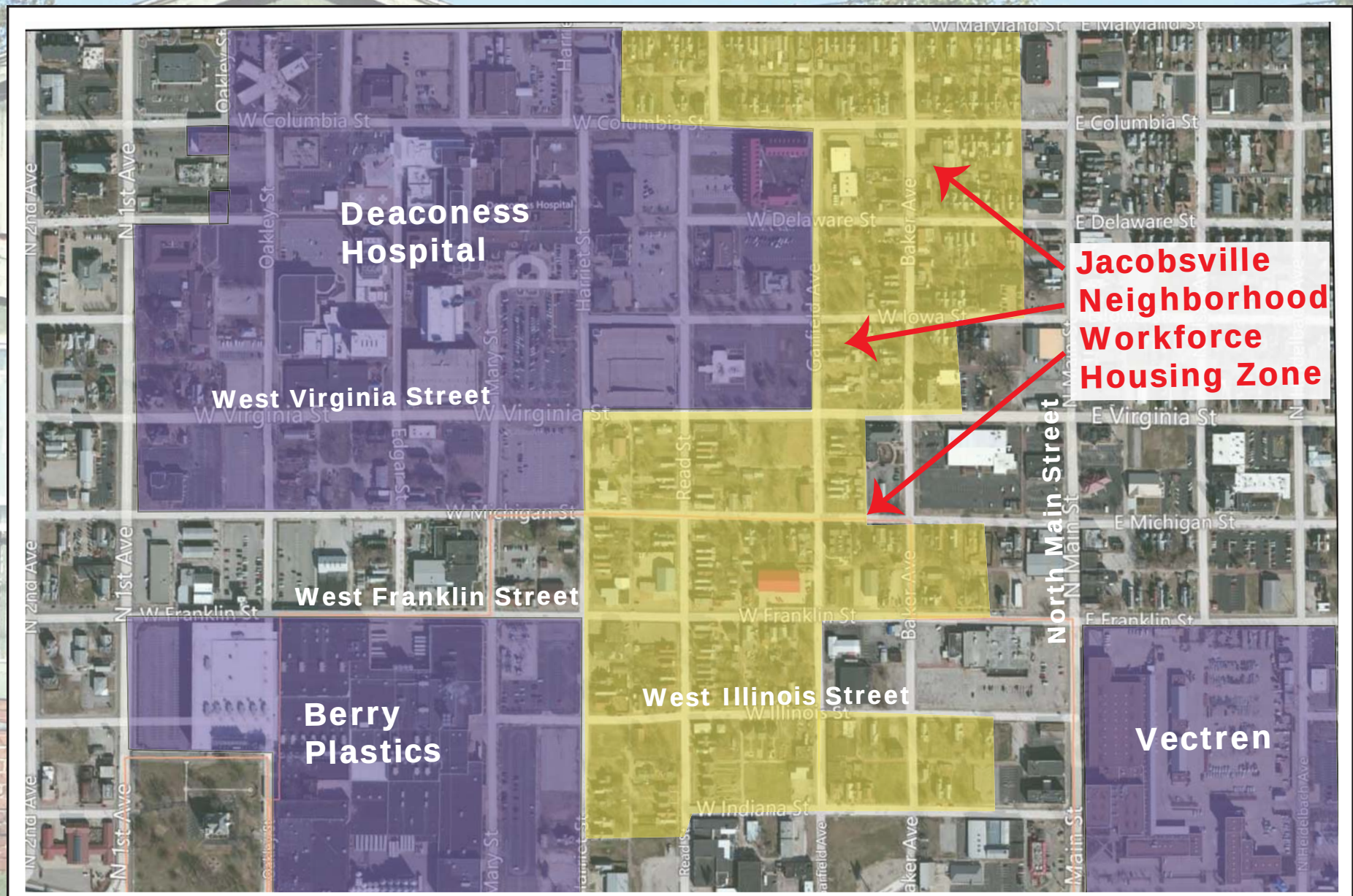
11 *A Country of Cities* by Vishaan Chakrabarti, Metropolis Books, 155 Sixth Avenue, 2nd floor, New York, NY, 10013, 2013

Workforce Housing Zones Near Urban Employment Centers

One of the prime location factors for housing redevelopment and the development of new urban housing is the relative proximity of proposed housing sites to employment opportunities. If residents can walk or bike to work, or if the location to the workplace is just a short drive away, low and moderate income families are able to reduce travel and commuting costs enabling them to spend a little more for housing, food and other necessities.

For example, in the Jacobsville Neighborhood, several major employers exist in proximity to affordable housing opportunities. One of the main infill strategies in Jacobsville should be to find means and methods of collaboration between the neighborhood and its major employers such as Berry Plastics, Deaconess Hospital, and Vectren, along with service businesses on North Main. The goal is providing housing opportunities for low to moderate income employees.

Figure 4-7: Jacobsville Workforce Housing Zone



TIF Workforce Housing Set-Aside

Housing Revolving Loan Fund through Mandatory TIF Set-Aside

Due to social and economic factors, both local and national, affordable housing needs are outpacing available resources. This expanding gap in the resources necessary to address the production and preservation of affordable housing threatens urban neighborhoods where the age of the housing makes refurbishing necessary and desirable. Failure to address the workforce housing issue will result in continued deterioration of inner-city neighborhoods and hardships on income-challenged families.

Funding is the fuel that makes the affordable housing engine produce. An ample and reliable source of funding to support various affordable housing initiatives would be a game-changer for the region, supporting numerous affordable housing opportunities that otherwise would not be pursued. Too often regional housing providers cannot pursue state/federal and private sector housing resources, due to the lack of having a competitive level of readily available local matching funds. Such funds could realize considerable return on initial investments. Affordable housing projects provide ample opportunities to package a number of finance programs which can generate up to 75% of development costs for a well-designed project.

To address the affordable housing issue, a local pilot funding initiative should be advanced. An existing mechanism with good potential for creating a viable funding pool is offered by the Tax Increment Financing (TIF) district concept. By utilizing the TIF concept, cities in Indiana can induce hesitant developers to commit resources and capital to a redevelopment district by offering government subsidies for these investments. By using eminent domain and tax exempt bonds, cities can reduce developers' costs and thereby reduce their risk. The TIF concept was originally created to redevelop "blighted areas" and promote development of economically depressed areas. Due to its effectiveness, it has evolved into a proven method for economic development of office parks and industrial centers. Oftentimes the needs and wellbeing of low and moderate income residents takes a back seat to commercial and industrial development. But it should not be forgotten that the TIF mechanism can be used by city officials to implement community-based economic development strategies for affordable housing, job creation and necessary public services. Oftentimes these developments may not occur in urban neighborhoods unless there is government intervention.

Pilot areas for a revolving loan fund could be located within existing Tax Increment Financing (TIF) districts. After careful consideration of the financial performance of each TIF area, a certain percentage of each of the TIF areas' proceeds should be dedicated and placed into a mandatory affordable housing account. In order to create meaningful levels of financial resources for the affordable housing accounts, the dedication of a certain percent of TIF resources will have to be retained over a multi-year period. An initial annual goal for the respective affordable housing accounts for each TIF area would be $500,000 to $1,000,000 per year over a three year term. From a statutory perspective, the use of TIF resources must "serve and benefit" the TIF area itself. This test should be foremost in mind when utilizing TIF resources. The legislature is actively considering changes to TIF enabling laws that would require funds to be used directly inside the TIF District where the funds are collected.

Once the funding mechanism is in place, efforts would be pursued to develop requests for proposals (RFPs) for affordable housing developments within the respective TIF areas. It is important to note that each of the TIF areas has different characteristics that reflect the diversity of the Vanderburgh and Warrick counties. RFPs should be developed in a manner that places emphasis on innovation and leveraging of other housing resources. However, a more important consideration should be how a project can leverage private investment and benefit the greater neighborhood. Other unique considerations associated with specific TIF Areas should also be included in the respective RFPs.

An expert panel composed of housing officials, urban planners, and financial institutions, along with the Redevelopment Commission officials that oversee the various TIF districts, should be asked to review the proposals that are submitted in response to the RFPs. The panel should develop selection criteria in advance of reviewing the proposals in order to develop an objective evaluation process.

All of the funds that are ultimately invested in the TIF area's affordable workforce housing projects are funds structured under a "Revolving Loan Fund" arrangement. This concept assures that funds are invested in housing projects as favorable loans with expected repayment. This revolving fund arrangement can help to create a self-perpetuating/sustainable fund that frames affordable housing in an economically leveraged business scenario rather than a "charity" framework. The loans would be structured with favorable terms, in order to entice the affordable housing development needed and desired. Such terms might consist of lowered interest rates or longer repayment terms. The fund will also be helpful in fostering development in areas where conventional lenders are hesitant or unable to invest to levels necessary for financially successful projects. Revolving loan funds would be instituted alongside private capital sources, in order to advance projects from marginal to feasible levels. However, the provision of "granting" funds should only remain an option, since some high value programs can provide substantial development opportunities, but require direct grant-type funding and cannot accept loan funds as the required match.

This funding initiative is similar to revolving loan funds that are designed to assist new and expanding businesses. Once the pilot has turned at least 3 cycles of housing initiatives, a careful review of the program will determine the value derived from it and the community's interest in continuing the program. However, it is advisable that an interim evaluation be conducted following each cycle in order to make continuous improvements to the program.

This outlined program could be initially instituted and administered by the Evansville Redevelopment Commission and the Evansville Department of Metropolitan Development for city TIFs and by the Vanderburgh County Redevelopment Commission for county TIFs, plus similar bodies in Warrick County.

RECOMMENDATION: *In all TIF Districts in Vanderburgh County and Warrick County, implement through legal ordinances, a Workforce Housing Set-Aside requirement. The Set-Aside requirement should comprise a Revolving Loan Fund to be used to provide gap financing and other incentives for private housing developers and/or not-for-profits. Require any multifamily developments proposed within a City of Evansville TIF District to have at least 5% of its units devoted to very low income households (30-60% of AMFI); and any multifamily developments proposed in a Vanderburgh or Warrick County TIF District to have at least 5% of its units devoted to low income families (50-80% of AMFI). Area Median Family Income (AMFI) can be determined using 2010 census tract information. These thresholds are to be verified, monitored, and enforced through a deed restriction or an enforceable contract with the Department of Metropolitan Development, or the Evansville Housing Authority or a community development corporation or other community development agency. As the TIF District generates revenue, a predetermined percentage will be set aside in a special Revolving Loan Fund that will be used to aid in bringing developments that are financially marginal into full feasibility. Local elected officials and housing officers will devise criteria for the selection of viable funding for private or not-for-profit entities by using TIF Set-Aside allocations.*

HUD RCAP Tracts

The Importance of Quality Community Schools

As mentioned in Volume 1, the school systems in the three counties, Vanderburgh, Warrick and Henderson, are high quality systems with award-winning programs for students. Schools in the urbanized area of Evansville recently underwent a major refurbishing and reorganization during the period from 2008 to early 2012. Four inner city schools were converted from grade 6-8 middle schools to K-8 full service elementary schools. These schools, Cedar Hall, Glenwood, Lodge, and Lincoln Elementary Schools have since become true community schools, complete with community clinics that serve both children and adults in their service areas, aerobics facilities, and meeting spaces. Significant housing efforts, designed to accompany school improvements, have also been mounted.

In the Cedar Hall district a new tax credit affordable housing complex has opened. In Glenwood, Habitat of Evansville has created an entire two blocks of new Habitat homes, directly adjacent to the new Glenwood Leadership Academy (the new name for the Glenwood K-8 elementary school). Near the Lincoln K-8 elementary school, new public housing has been developed by the Evansville Housing Authority directly across from the school; and within three or four blocks of Lincoln, the Memorial Housing Development Corporation has built affordable townhomes using both the low income housing tax credit program, along with Community Development Block Grant funding. Page 83 in the Millennial Growth and Revitalization Plan shows the opportunity areas in the Lodge Elementary School neighborhood for the development of affordable workforce housing.

A Closer Look at the HUD RCAP Tracts

HUD identified two census tracts in the entire three-county region, which have a family poverty rate of greater than or equal to 40 percent and a majority non-white population of greater than 50 percent, and are thereby classified as tracts with high concentrations of racial minorities and high concentrations of poverty. These tracts, as shown on page 137, are census tracts 001300 and 001400. Tract 001500 can be called a "Transition Zone" between the two RCAP tracts. In Tract 001500, the City of Evansville, the Evansville-Vanderburgh School Corporation, the Boys' and Girls' Club, and the African-American Community have actively strived to provide resources and support for households in poverty. The RCAP Assets Map reflects recent improvements within the Transition Zone that falls between the two RCAP Census Tracts. (See Figure 4-8 and Figure 4-9.)

Six projects of note within or directly adjacent to the RCAP tracts are as follows:

- **Lincoln Elementary School** – The Evansville-Vanderburgh School Corporation completed major expansion and renovations that transformed Lincoln from a grade 6 – 8 school into a Kindergarten through Eighth Grade elementary school. This strategy increased enrollment and involved more families from the local community in school activities. A second gymnasium was added along with classrooms and labs.

- **Boys' and Girls' Club of Evansville** – The Boys' and Girls' Club has constructed its headquarter facilities immediately east of the Lincoln Elementary School. The new facility maintains after school hours of 2:30 to 7:30 p.m. The following programs are offered:
  - Character and Leadership
  - Education and Career
  - Health and Life Skills
  - The Arts
  - Sports, Fitness, and Recreation

- **City Municipal Pool and Splash Park** – The City of Evansville constructed a new public swimming pool on Lincoln Avenue, also east of Lincoln Elementary School. The facility has accommodations for very young children, teens and adults.

- **The Evansville African-American Museum** – The Evansville African American Museum on the site of the original Lincoln Gardens Public Housing Project, sits just northwest of Lincoln Elementary School.

- **Grocery Outlet Store** – The wholesale Grocery Outlet Store, situated just west of Lincoln Elementary School, provides a full range of food and sundries for an area that was once considered a "food desert."

- **Walnut Center Urban Industrial Park** – The Walnut Center Urban Industrial Park was created as an urban reinvestment program that would potentially provide jobs for inner city residents who live nearby in the two RCAP Census Tracts. The track record of Walnut Center employment of these inner city residents has not been appreciable. The City of Evansville should look at further incentives for employers in the Walnut Center Urban Industrial Park (See Figure 4-8) to provide more jobs for their inner city neighbors.

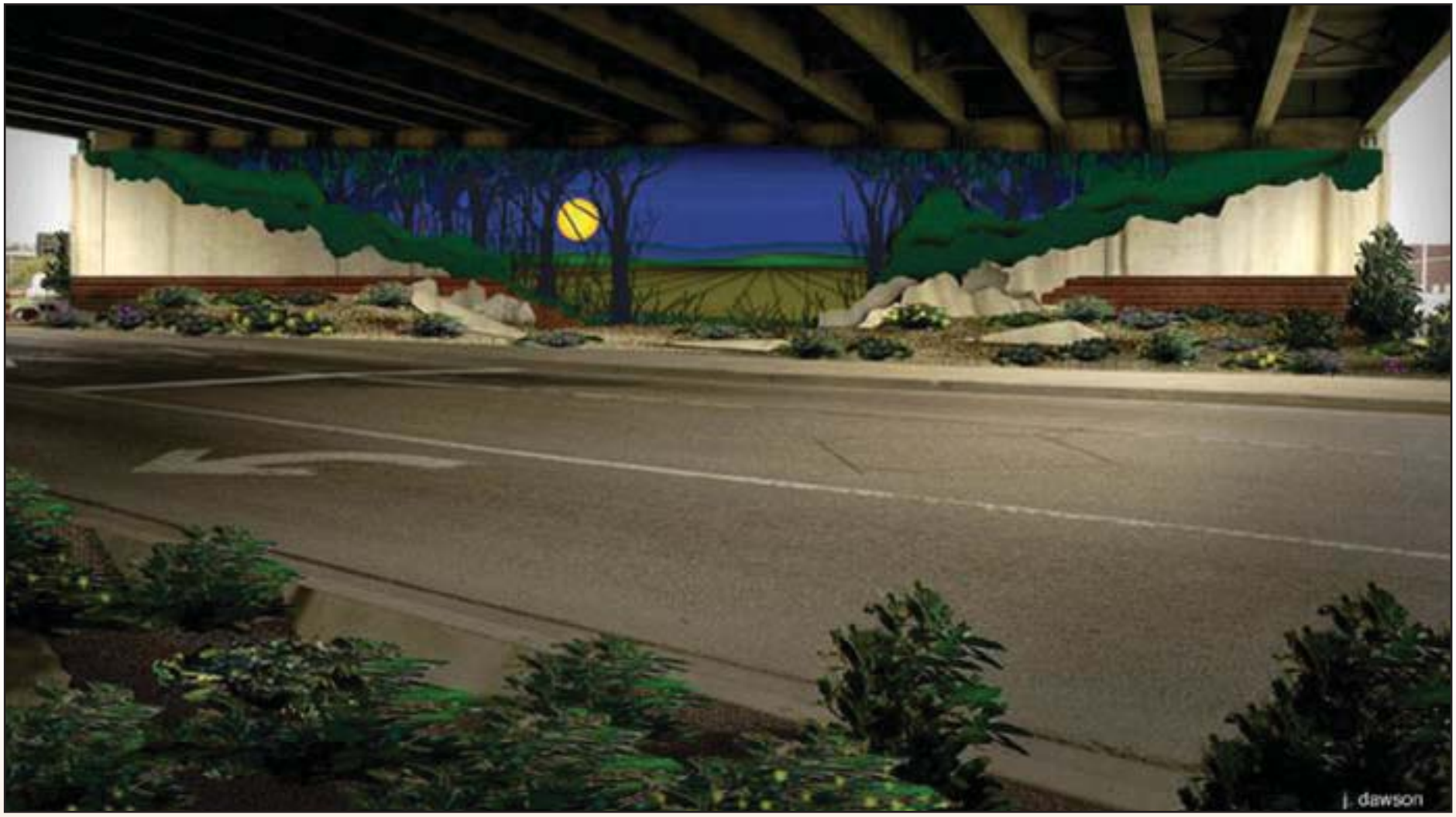
To provide more transportation options to urban residents, an east-west rapid bus transit route should be explored as Phase Two, after completion of the Highway 41 north-south route, and after studies confirm the Highway 41 feasibility. A regional Comprehensive Operations Analysis of the area bus systems should examine the potential for this east-west rapid bus transit line along Lincoln Avenue or Covert Avenue or forming a loop using both. The dedicated line, with stops spaced approximately one mile apart along the east-west loop, could give residents in tracts 001300 and 001400 more mobility for access to medical services and wider opportunities for employment.

Figure 4-8: Two RCAP Tracts & Transition Zone

Figure 4-9: Six RCAP Assets

Significance of Faith-Based Organizations and Non-Profits in the Affordable Housing Arena

In addition to effective housing agencies and housing officials in all three counties, the presence of both faith-based and non faith-based non-profits operating with a heartfelt mission of providing safe, decent housing for low and moderate income families has had a positive impact on urban neighborhoods in the region. Habitat for Humanity, specializing in new, single story affordable housing; Memorial Community Development Corporation, leveraging CDBG funding and tax credit financing for attached townhomes and garden apartments; Aurora, Inc., working on strategies to end homelessness; ECHO Housing Corporation, providing special housing to homeless veterans; and a new faith-based not-for-profit, Community One, focusing on community development and housing rehabilitation, have all had very positive impacts in the affordable housing arena. Future partnerships and collaborations will be crucial to continuing the struggle to see decent housing for all.



Gateway to the STAR Neighborhood - Lloyd Expressway at First Avenue
Courtesy of John Dawson, Muralist

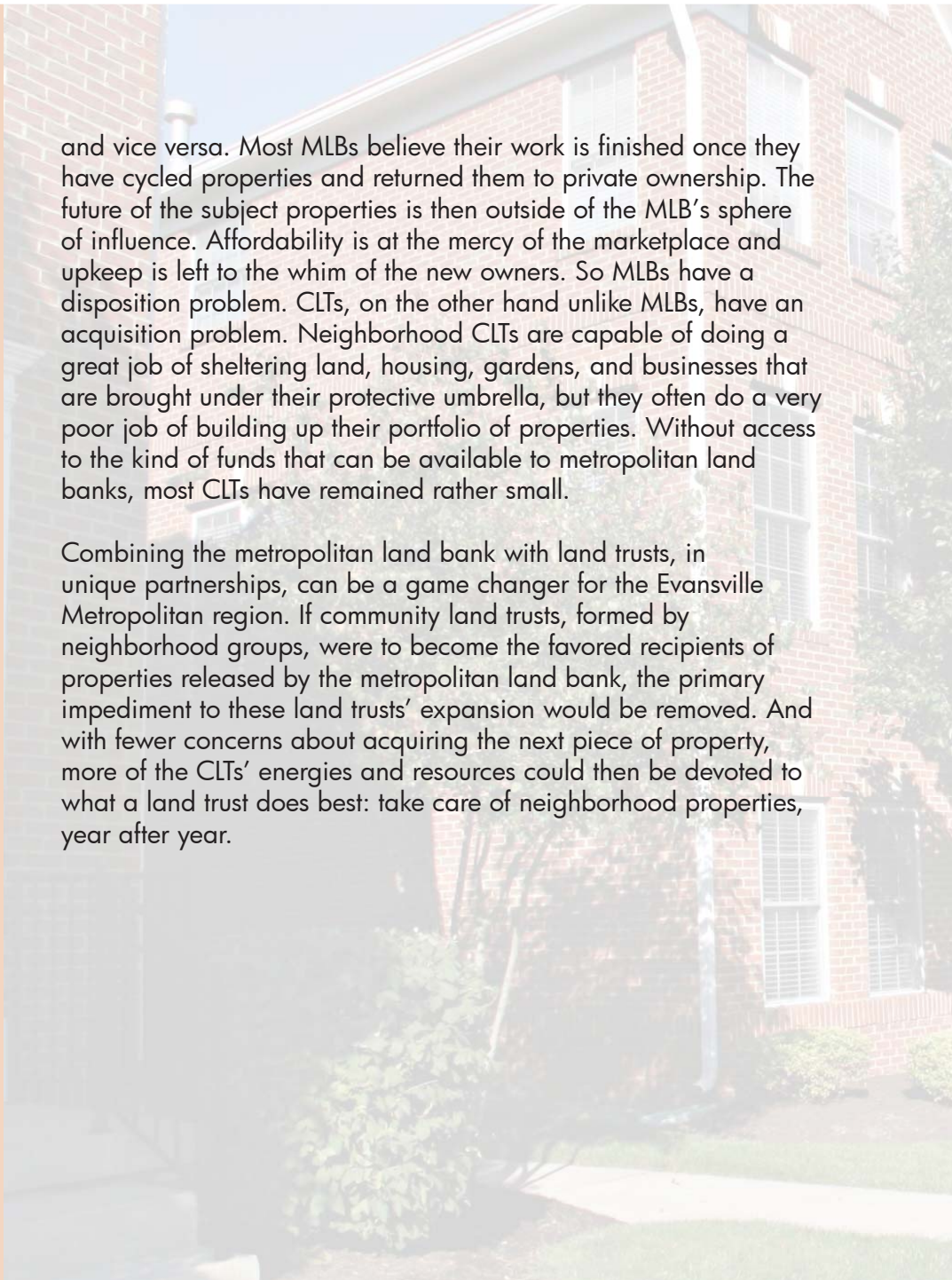
Using Community Land Trusts to Implement Projects Initiated by the Metropolitan Land Bank

Community Land Trusts, formed as nonprofit corporations by neighborhood groups or other not-for-profits, can be used to continue the work begun by the Metropolitan Land Bank. A Metropolitan or Municipal Land Bank (MLB) is a public or quasi-public corporation chartered by a city or county government or governments. The real estate acquired by a Land Bank is usually held for 3-5 years. The Land Bank generally removes on-site contaminants and debris, establishes clear title, and prepares sites of various sizes for redevelopment. A Land Bank's properties are then conveyed to private owners, with few restrictions concerning long-term use.

Community Land Trusts (CLTs), on the other hand, are nonprofit corporations, initiated and supervised by neighborhood residents. A CLT can be a potent force in seeing that properties acquired and prepared by the Regional or Municipal Land Bank (MLB) are put to uses that agree with the neighborhood's avowed or declared mission, whether it be development of parks and open space or affordable housing or both. One reason the CLT is the ideal entity to implement projects related to land use, affordable housing, parks and managed lands, is that CLTs typically acquire lands through gift or purchase and then retain ownership forever. Any buildings already on lands acquired are usually sold to other nonprofits, limited partnerships, small businesses or individuals. The new owners gain exclusive use of the underlying land through a long-term ground lease. But the CLT maintains restrictions over the use and resale of all buildings on CLT properties.

Forming Community Land Trusts (CLTs) and Municipal Land Banks (MLBs) are frequently viewed as competing strategies for securing control over abandoned properties and blighted areas. But used to their distinctive and individual advantages, CLTs and MLBs can be complementary partners. The main reason CLTs and MLBs make good partners is that one's strength is the other's weakness and vice versa. Most MLBs believe their work is finished once they have cycled properties and returned them to private ownership. The future of the subject properties is then outside of the MLB's sphere of influence. Affordability is at the mercy of the marketplace and upkeep is left to the whim of the new owners. So MLBs have a disposition problem. CLTs, on the other hand unlike MLBs, have an acquisition problem. Neighborhood CLTs are capable of doing a great job of sheltering land, housing, gardens, and businesses that are brought under their protective umbrella, but they often do a very poor job of building up their portfolio of properties. Without access to the kind of funds that can be available to metropolitan land banks, most CLTs have remained rather small.

Combining the metropolitan land bank with land trusts, in unique partnerships, can be a game changer for the Evansville Metropolitan region. If community land trusts, formed by neighborhood groups, were to become the favored recipients of properties released by the metropolitan land bank, the primary impediment to these land trusts' expansion would be removed. And with fewer concerns about acquiring the next piece of property, more of the CLTs' energies and resources could then be devoted to what a land trust does best: take care of neighborhood properties, year after year.



Collaboration Strategies for the Development of Workforce Housing: Six Prototypes

The following prototypes rely on collaboration between housing and social services providers including, but not limited to, Habitat for Humanity of Evansville, and of Henderson, the ECHO Housing Corporation, HOPE of Evansville, the Memorial Baptist Community Development Corporation, and Community One. The suggested strategies for the six prototypes involve partnering with the City of Evansville Department of Metropolitan Development using Community Development Block Grant (CDBG) funding; optimizing private charitable and philanthropic sources; utilizing the private sector for innovative market rate housing (Chandler, Indiana); and creating partnerships with local private corporations interested in workforce housing for their employees. The following six examples, presented as prototypes, could be developed in other parts of the region by adapting to the specifics of other locations.

Waggoner Avenue Collaboration:

A Mixed Use Housing Project in the Glenwood Neighborhood, this collaboration is shaping up to involve the Evansville Brownfields Corporation, a land trust; the Memorial Community Development Corporation; Habitat for Humanity of Evansville; Community One; the City of Evansville; Evansville Parks and Recreation; and the Evansville Department of Metropolitan Development. The project involves a mixed use development with a sandwich shop, a dollar store, and a hardware store, all having affordable loft housing above. The mixed use part of the effort is to be developed on land owned by Habitat. Land donated by the Evansville Brownfields Corporation along Waggoner Avenue is to be developed as attached townhouses for low and moderate income residents in the Low Income Housing Tax Credit (LIHTC) program, administered by the State of Indiana.

Figure 4-10: Waggoner Avenue Site Plan

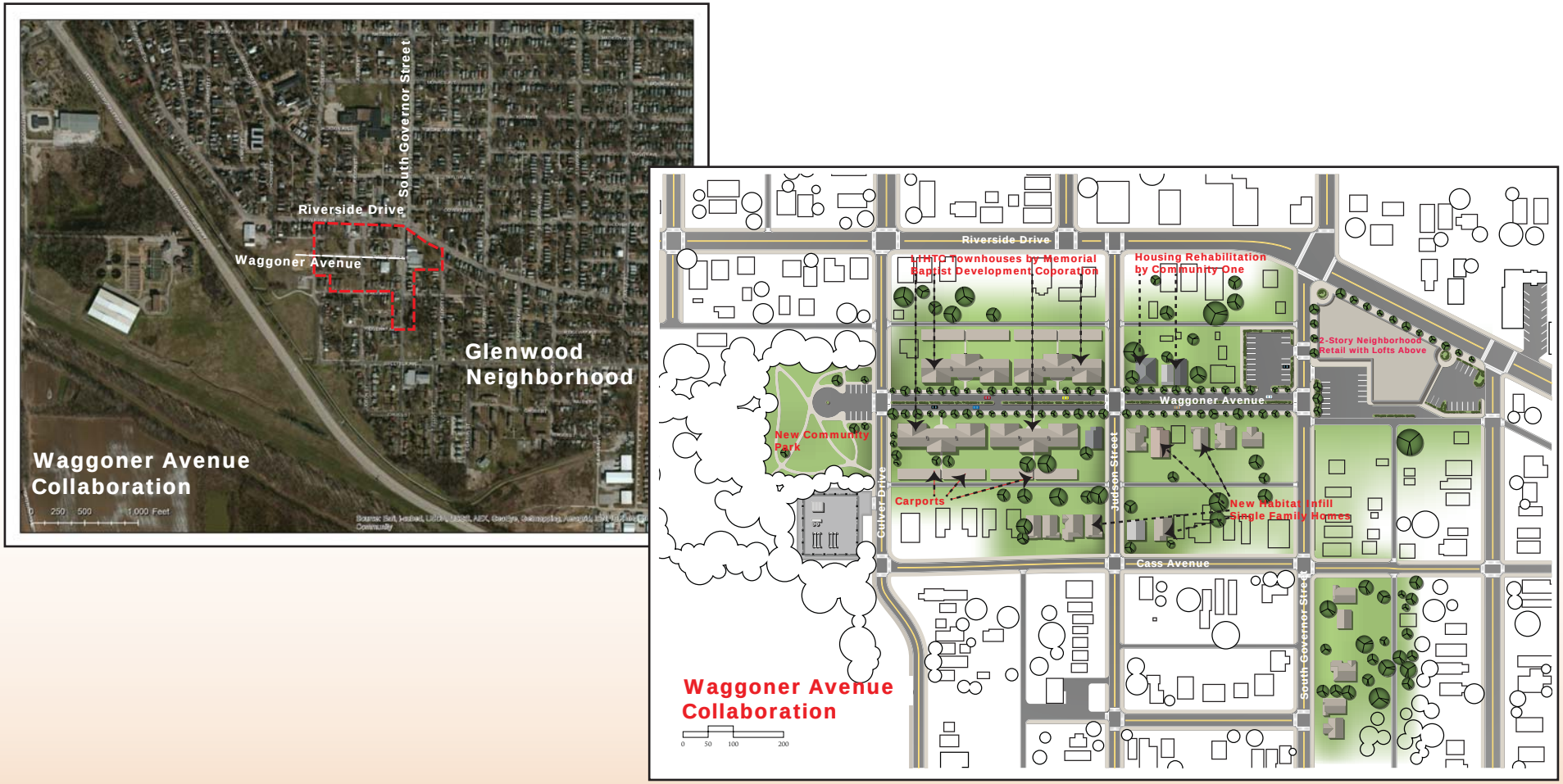


Figure 4-11: Garfield Avenue Site Plan

Garfield Avenue Collaboration:

This effort in Evansville's Jacobsville Neighborhood is another local collaboration featuring workforce housing for Deaconess Hospital workers, within two blocks of Deaconess. Deaconess is donating most of the land for this collaboration. Other participants include the ECHO Housing Corporation, who is also serving as the lead convener of the "Jacobsville Join-In" neighborhood revitalization program. ECHO will be developing LIHTC attached multifamily housing and inner-block parking, as shown on the site plan. Habitat for Humanity, the other collaborator, is completing "infill" housing for home ownership with single family houses designed to fit within the neighborhood context. Deaconess is also constructing a large new neighborhood park.

Chandler Infill Housing:

The Chandler Infill Housing program does not have a developer yet. The site plan shown is a prototype for market rate attached townhomes in duplex, triplex, and four-plex configurations. The program would consist of attached townhome construction geared to moderate-income middle class residents. The availability of the real estate has not been determined. The Chandler project is envisioned to be a joint effort by a private developer, along with cooperation from the Town of Chandler.

Figure 4-12: Chandler Infill Site Plan

Chandler Senior Living:

Another area in the Town of Chandler, ideal for senior housing, is a site that is near a park and is also within walking distance of the local elementary school. The location map and site plan shown as Figure 4-13 depicts the possible layout of this affordable housing tax credit (LIHTC) project.

Figure 4-13: Chandler Senior Living Site Plan

CHAIN and STAR Neighborhoods:

The CHAIN (Cedar Hall) and STAR neighborhoods, shown on the map in Figure 4-14, constitute a culturally diverse community with a variety of land uses, natural features, and unique facilities. The area shown contains affordable workforce housing, employment centers (Uniseal, Lewis Bakeries and others), a new K-8 elementary school (Cedar Hall), as well as one of the newest TIF (Tax Increment Financing) districts. The CHAIN/STAR Community should be considered by the Department of Metropolitan Development of the City of Evansville for a full-blown Community Plan, similar to the recently completed Jacobsville Plan. An important part of any CHAIN/STAR community planning efforts should be the creation of a mixed use theater district along Fulton Avenue. A new TIF District should also be considered along this portion of Fulton Avenue. This new Theater District/TIF District is strategically located between the CHAIN and STAR neighborhoods and would be a key factor in the successful revitalization of these neighborhoods.

When conducting any form of housing collaboration or neighborhood planning effort, it is well to observe the guidelines and checklists published in the LEED ND manual called "Technical Guidance Manual for Sustainable Neighborhoods: How to Use the LEED for Neighborhood Development Rating System to Evaluate and Amend Local Plans, Codes, and Policies."

Figure 4-14: CHAIN/STAR

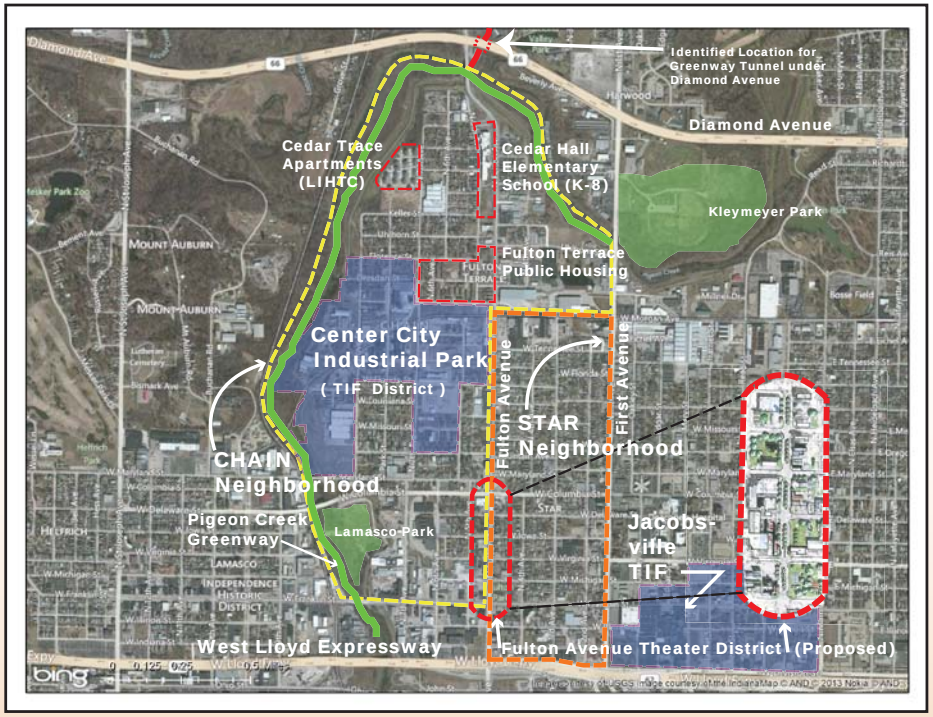
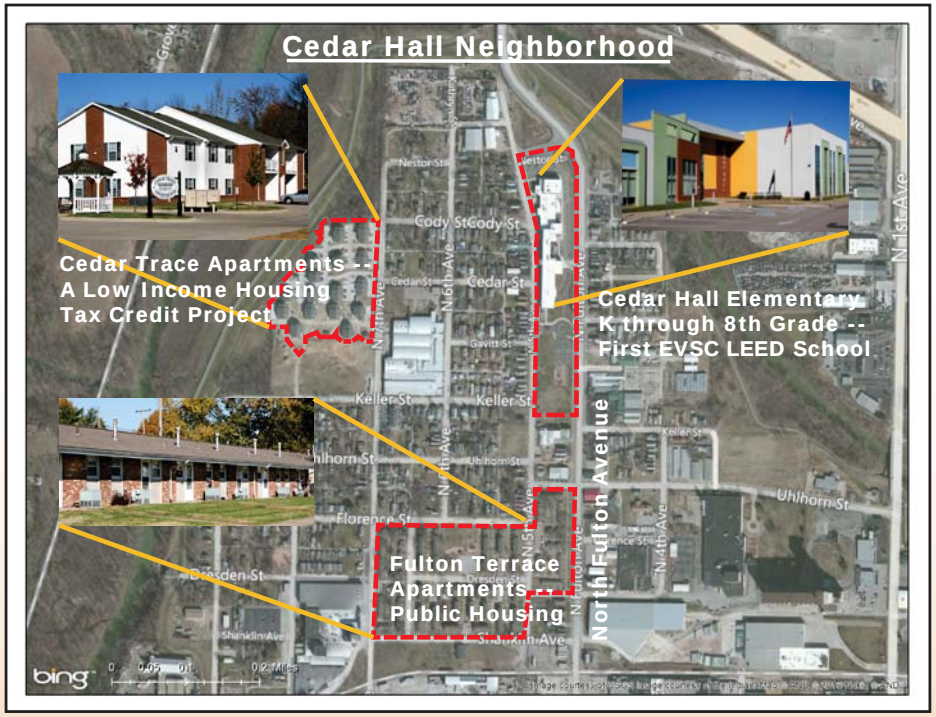


Figure 4-15: Cedar Hall Neighborhood



Henderson East End:

The Henderson community has been active recently in organizing resources for the revitalization of the East End. The Henderson East End is a historic urban neighborhood with great potential for providing a diversity of housing styles for a wide range of family income levels. The Second Street Corridor (the north boundary of the East End) is an important gateway into Henderson and will become even more significant with the completion of I69.

In Volume 4 of this SEAC Sustainable Development effort, a Focus Area Plan of the East End with key projects is presented. Figure 4-17 shows land use and housing subareas within the East End. The City of Henderson should consider commissioning a full-blown housing condition and infrastructure condition survey of the East End, in order to base future programming and capital improvements in that area.

Figure 4-16: Henderson Gateway District

Figure 4-17: Henderson East End Housing and Land Use

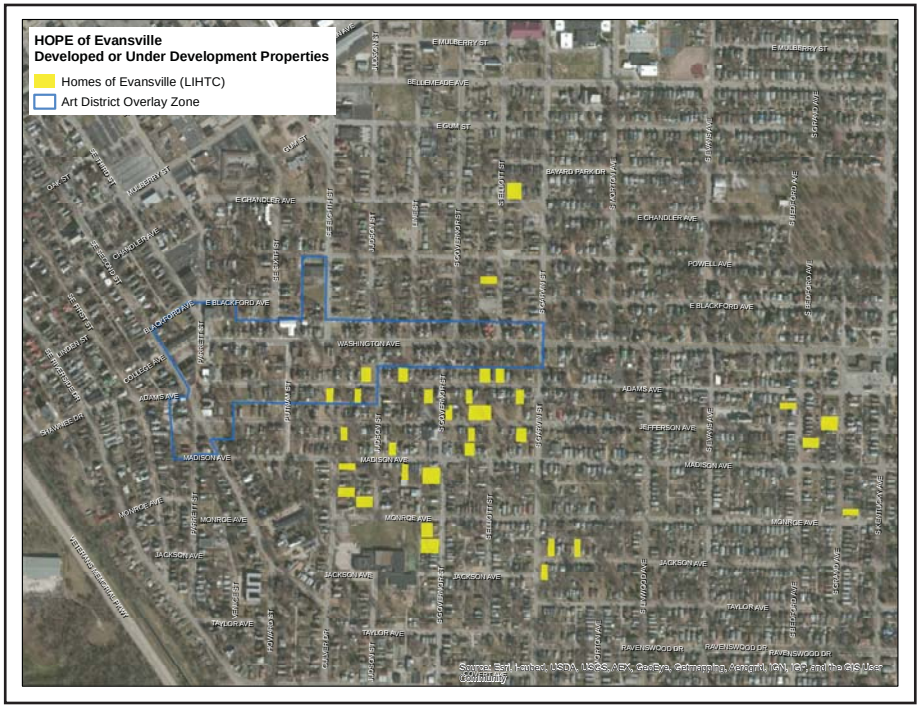
ENGAGE HENDERSON | EAST END HOUSING AND LAND USE SUB-AREAS

Collaboration Strategies with Nationally Recognized Organizations Specializing in Workforce Housing

Corporations and Not-for-Profit Organizations from across the country bring varying levels of expertise in providing neighborhood revitalization strategies and workforce housing renovation and new construction to local communities. These professional experts can often bring innovative solutions that have worked in other localities, but have not been tried yet by housing groups in the Evansville region. An excellent example is the recent partnership between HOPE of Evansville and the NRP Group, LLC. This association of local affordable housing professionals from HOPE with the nationally-recognized housing specialists from NRP Group, LLC, (with offices all over the continental United States), proved to be an effective blend of local and national expertise that delivered a project of excellence. Using the Low Income Housing Tax Credit program, which was devised to get the private sector involved in affordable housing production and blighted neighborhood revitalization efforts, this team produced 40 scattered–site single family homes using the Low Income Housing Tax Credit (LIHTC) program in the Blackford's Grove, Culver, Goosetown, Haynie's Corner and Wheeler Drive neighborhoods and struck a blow for neighborhood stability and resurgence.

The project delivered by HOPE/NRP, called HOMES of Evansville, LLC, cost $9.45 million and 95 percent of the project was through private investment. The homes were designed to fit within their context and even set a high bar for design, coloration, and workmanship. The homes are rent to own, so if an individual or family is willing to stay for at least fifteen years in their new home, they can become homeowners.

Figure 4-18: Map of 40 Houses NRP



Other national partner possibilities are listed below:

The Community Builders, Inc.
Midwest Region
135 South LaSalle Street
Suite 3350
Chicago, IL 60603
Phone: (312) 577-5555

Affordable Housing Community Development Corporation
812 South Washington Street
Marion, Indiana 46953-1967
Phone: (765) 662-1574

Enterprise Community Partners, Inc.
(Founded by James W. Rouse)
70 Corporate Center
11000 Broken Land Parkway
Suite 700
Columbia, Maryland 21044
Phone: (800) 624-4298

The Housing Partnership, Inc.
1797 Wilart Drive
Louisville, Kentucky 40210
Phone: (502) 585-5451

The NRP Group, LLC
5309 Transportation Boulevard
Cleveland, Ohio 44125
Phone: (216) 475-8900

In addition to the organizations listed to the left, three important state agencies can be enlisted for support and potential funding for housing and community development projects and programs.

Indiana Association for Community Economic Development (IACED)
202 East Market Street
Indianapolis, Indiana 46204
Phone: (317) 454-8533

Kentucky Housing Corporation
1231 Louisville Road
Frankfort, Kentucky, 40601-6191
Phone: (502) 564-7630

Indiana Housing and Community Development Authority (IHCDA)
30 South Meridian Street
Suite 1000
Indianapolis, Indiana 46204
Phone: (317) 232-7777

Workforce and Senior Housing Locations in Prototype Neighborhoods

The maps that follow delineate future growth zones that are conducive to mixed income and mixed land use. The core of each development node is targeted to offer a minimum of 5-10 percent of its density housing to be affordable to low income, working families.

The Highway 41 Node, shown at right in Figure 4-19, contains the new North High School and Middle School, along with Scott Elementary School. Schools are capable of contributing significantly to viable, cohesive neighborhoods, often acting as community centers and centralized gathering places. It is desirable to provide a wide variety of housing types in the heart of such school districts so that all income levels are welcomed and represented within these high quality public school facilities. It should be made clear from all of the nodes presented that mixed income, mixed use development can contribute to a neighborhood's sense of place and walkability.

Figure 4-19: Highway 41 Node

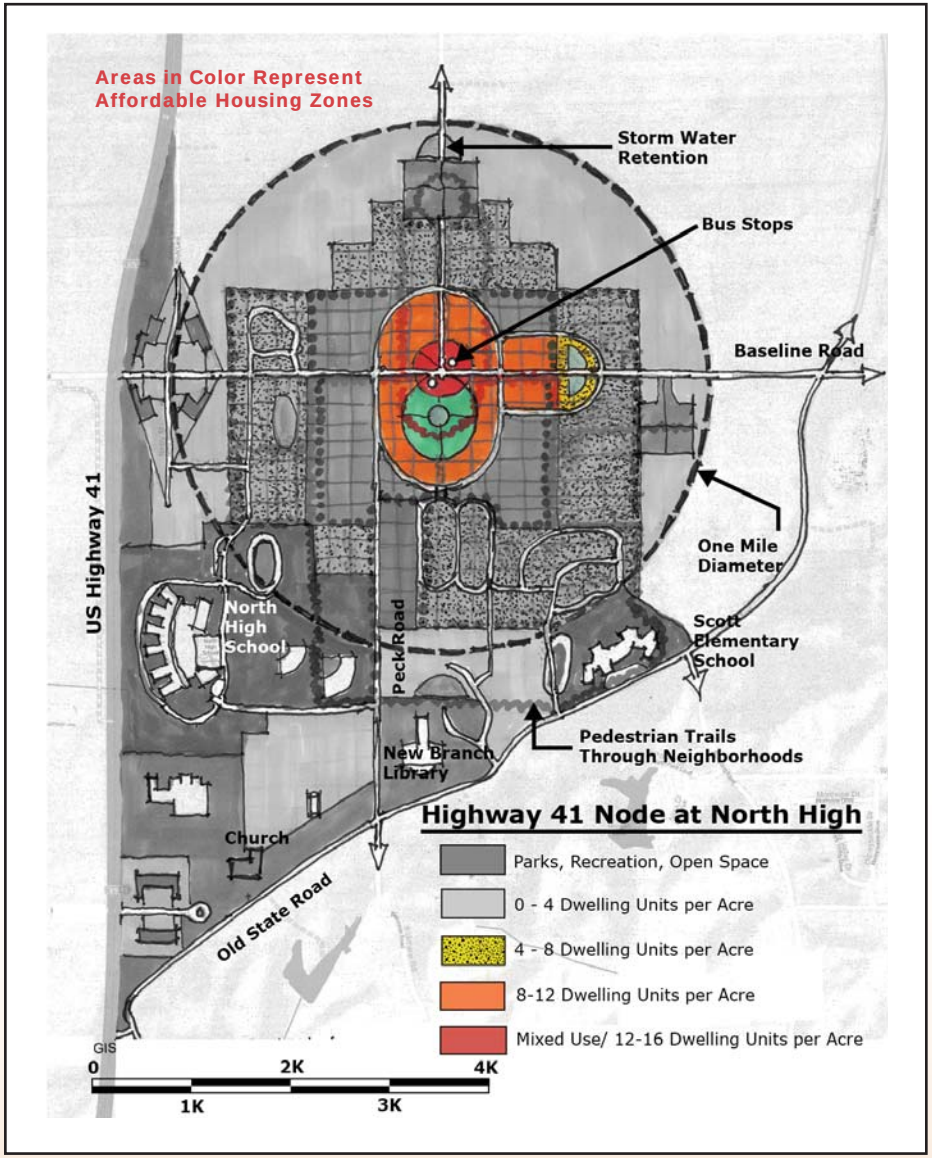


Figure 4-20: Lynch Road Node

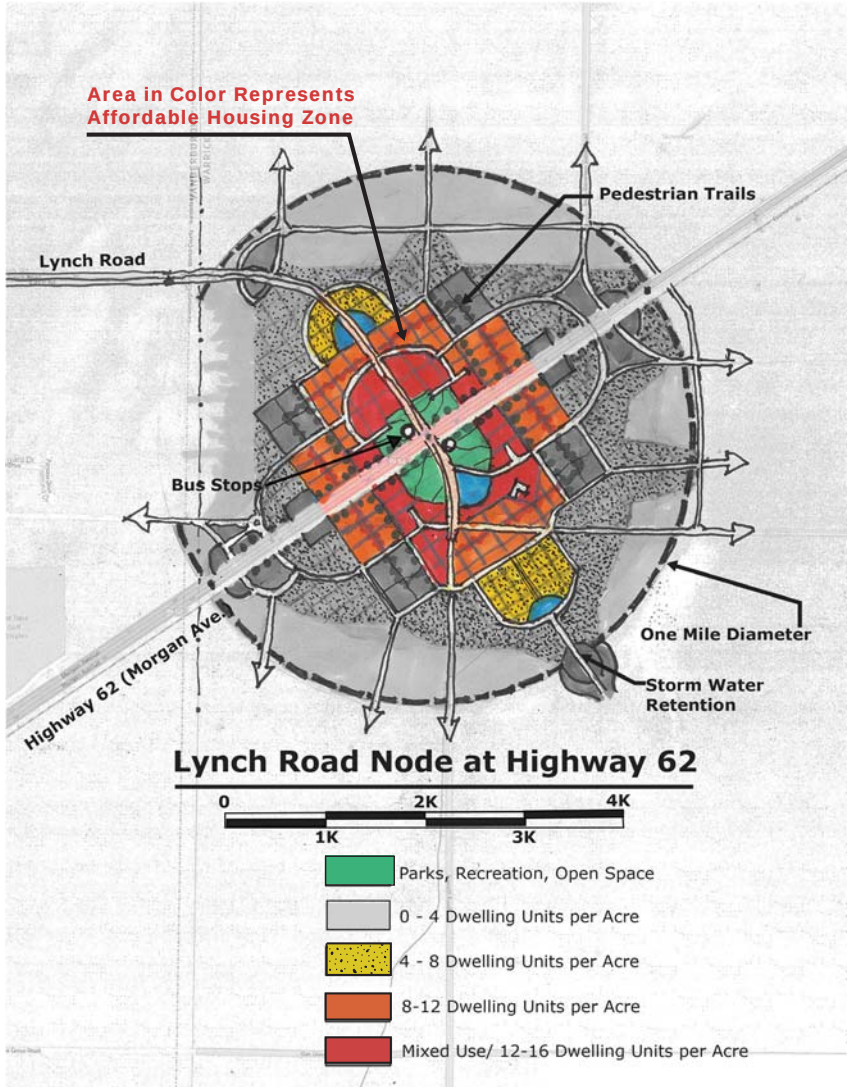


Figure 4-21: I-69 at SR 60

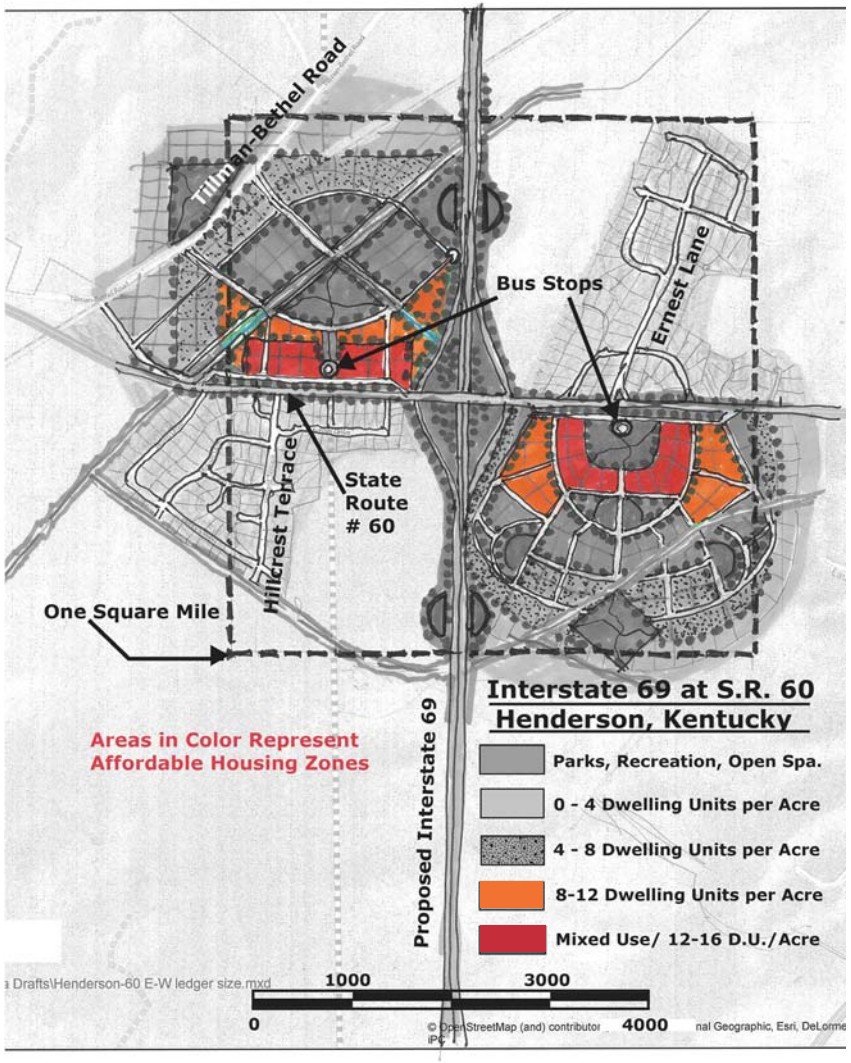


Figure 4-22: Lakewood Hills Development

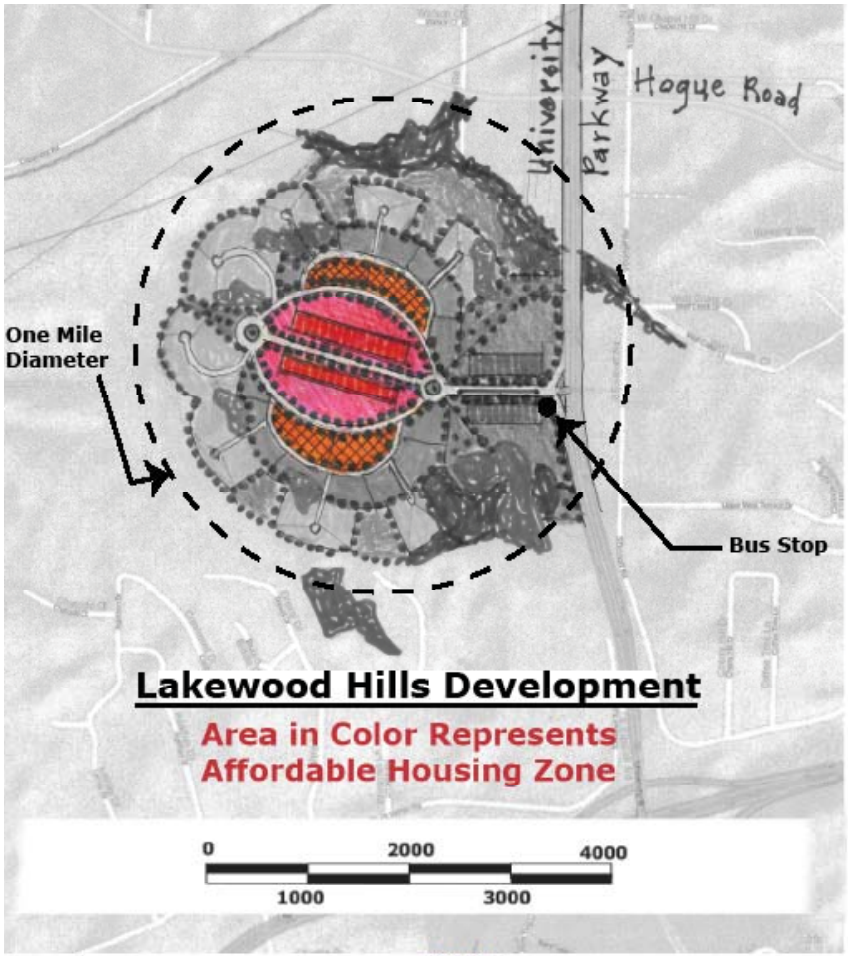


Figure 4-23: Lodge School Node

Areas shown in color on the preceding five maps, as well as on the maps shown on this page, are geographic areas in the core of the various neighborhood nodes where workforce housing is desirable. It is not intended that the entirety of these areas in color are populated with affordable workforce housing, however. Rather, it is intended that if low-mod or affordable workforce housing is planned for the particular neighborhood in question, the core of the neighborhood, in proximity to mixed use development, commercial services, park space and bus service is highly desirable for locating the planned workforce housing. Centralized locations, such as the areas in color shown, can assist families in reducing vehicle miles traveled and, thereby, lowering their transportation costs.

Figure 4-24: Boonville Node

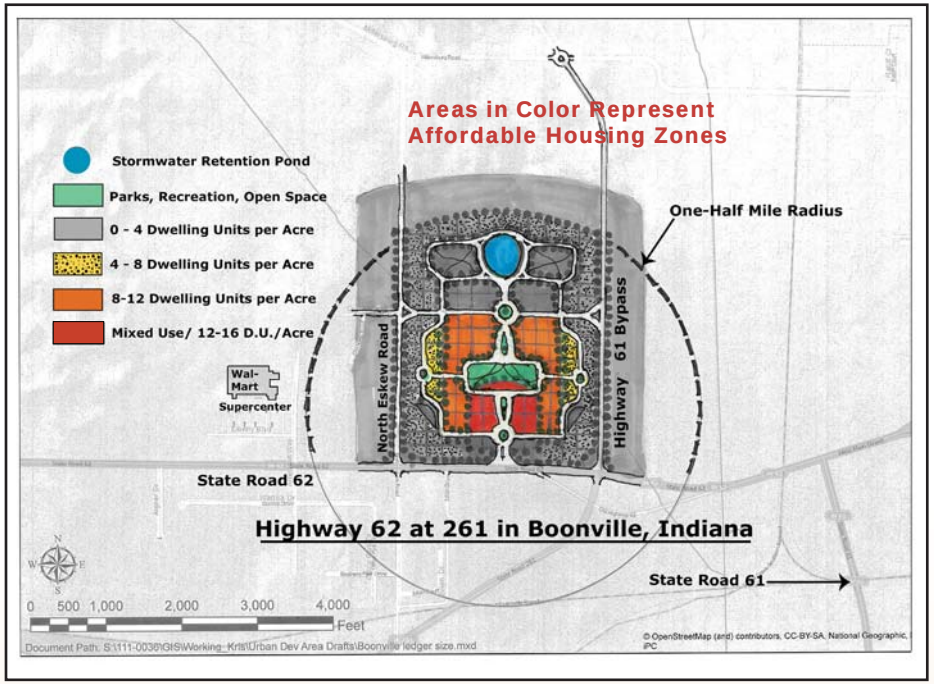


Figure 4-25: Village Earth Development

Opportunity Areas and Inclusionary Zoning Initiatives

The dark green areas in Figure 4-26 and Figure 4-27 represent locations close to employment centers that are conducive to mixed-housing development. The federal department of Housing and Urban Development has established an index that measures "opportunity," or the ability of a person or family to access and capitalize on opportunity. The index is a function of the following dimensions:

- School Proficiency
- Levels of Poverty
- Labor Market Engagement
- Neighborhood Stability
- Job Access.

Higher numbers on the Opportunity Map indicate higher levels of opportunity in the dimensions shown above. It has generally been found that the higher the opportunity index score, the greater the availability of sustainable employment, high-performing schools, safer neighborhoods with less crime, access to high-quality healthcare, adequate transportation choices, and quality childcare.

In these "opportunity" areas, it is productive to offer incentives to builders and developers that motivate them to provide workforce housing units near bus lines and employment opportunities. Chapter 7 will outline land use policies and controls intended to give builders and developers effective and efficient inducements in all three counties to provide housing opportunities that fit a wide range of income levels.

Figure 4-26: Opportunity Ranking/Scores

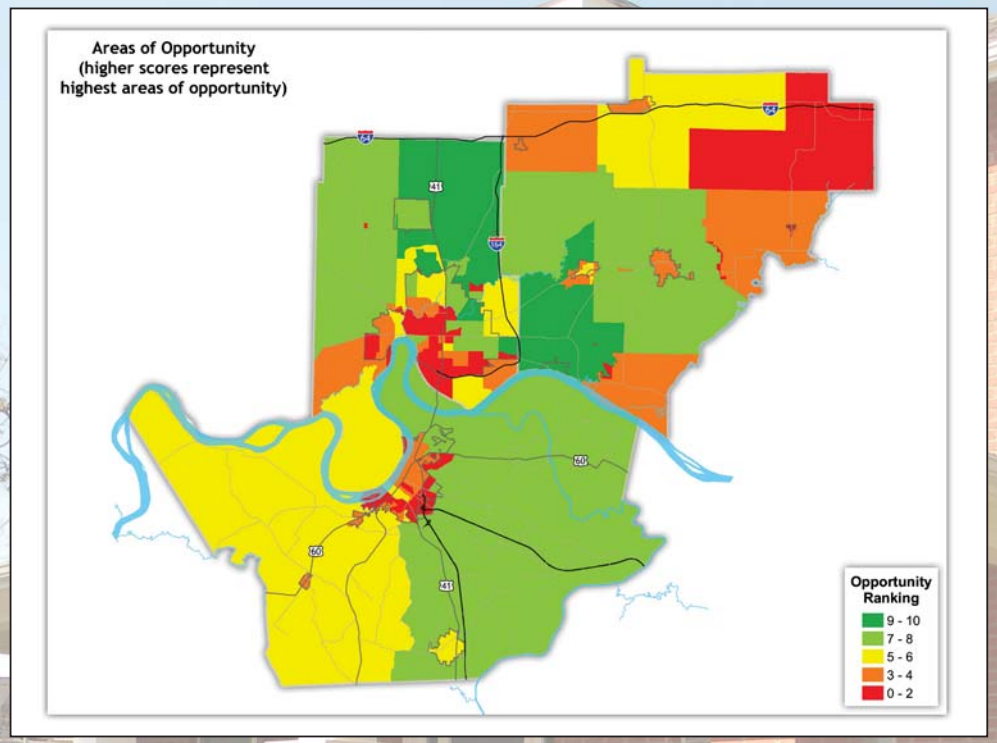
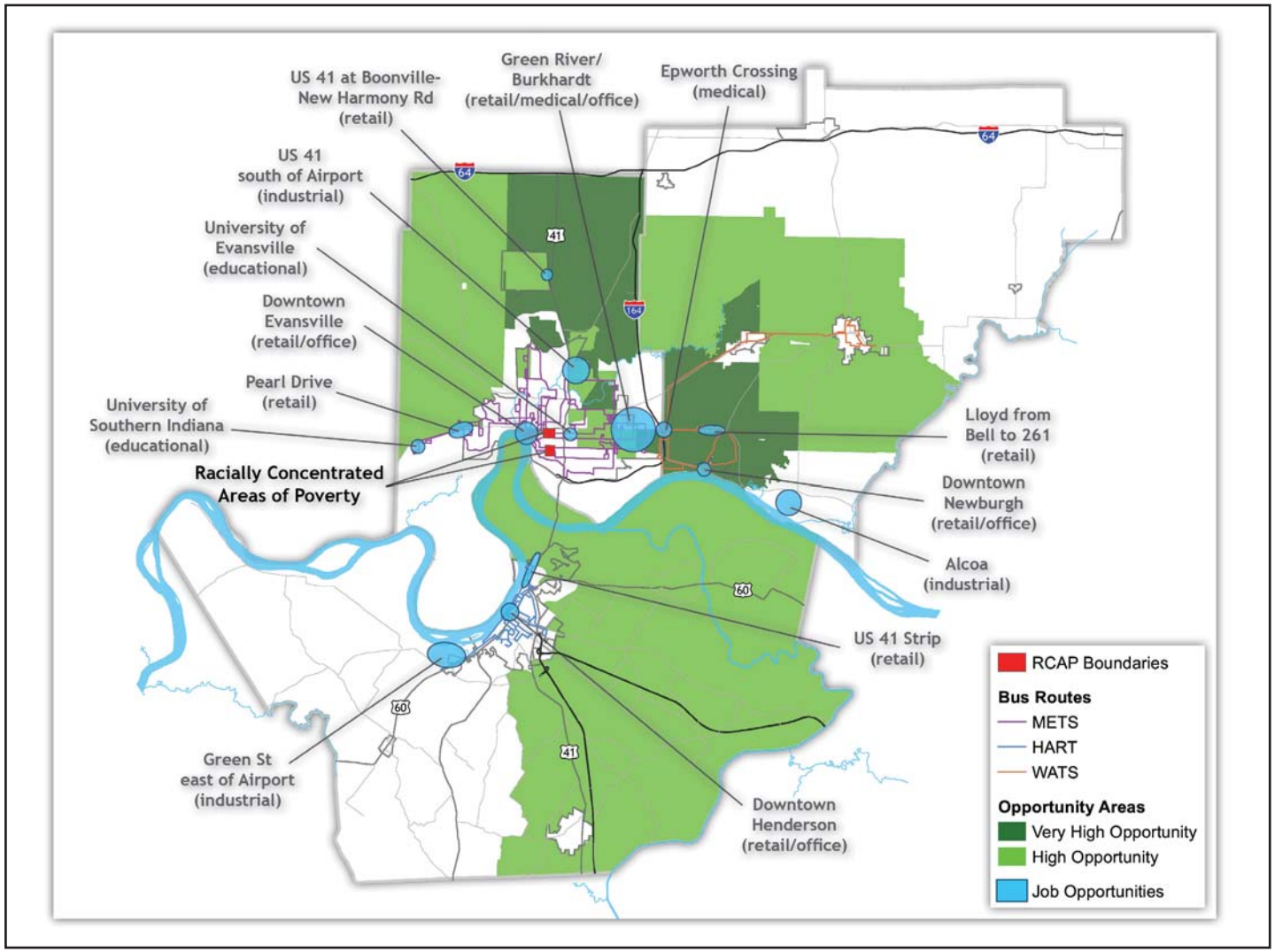


Figure 4-27: Opportunity Areas



RECOMMENDATION: *In designated Opportunity Areas and affordable housing target zones (see previous maps), establish special developer incentives: streamlined approval procedures with fee waivers, tax abatement programs, and building density bonuses in order to motivate the private sector to provide affordable workforce housing. See Chapter 7 for more details on incentive program locations and provisions. When multifamily developments are located in TIF Districts, financial incentives will be provided through the TIF District's revolving loan fund set-aside.*

Chapter 5 - Millennial Environment & Green Infrastructure Plan

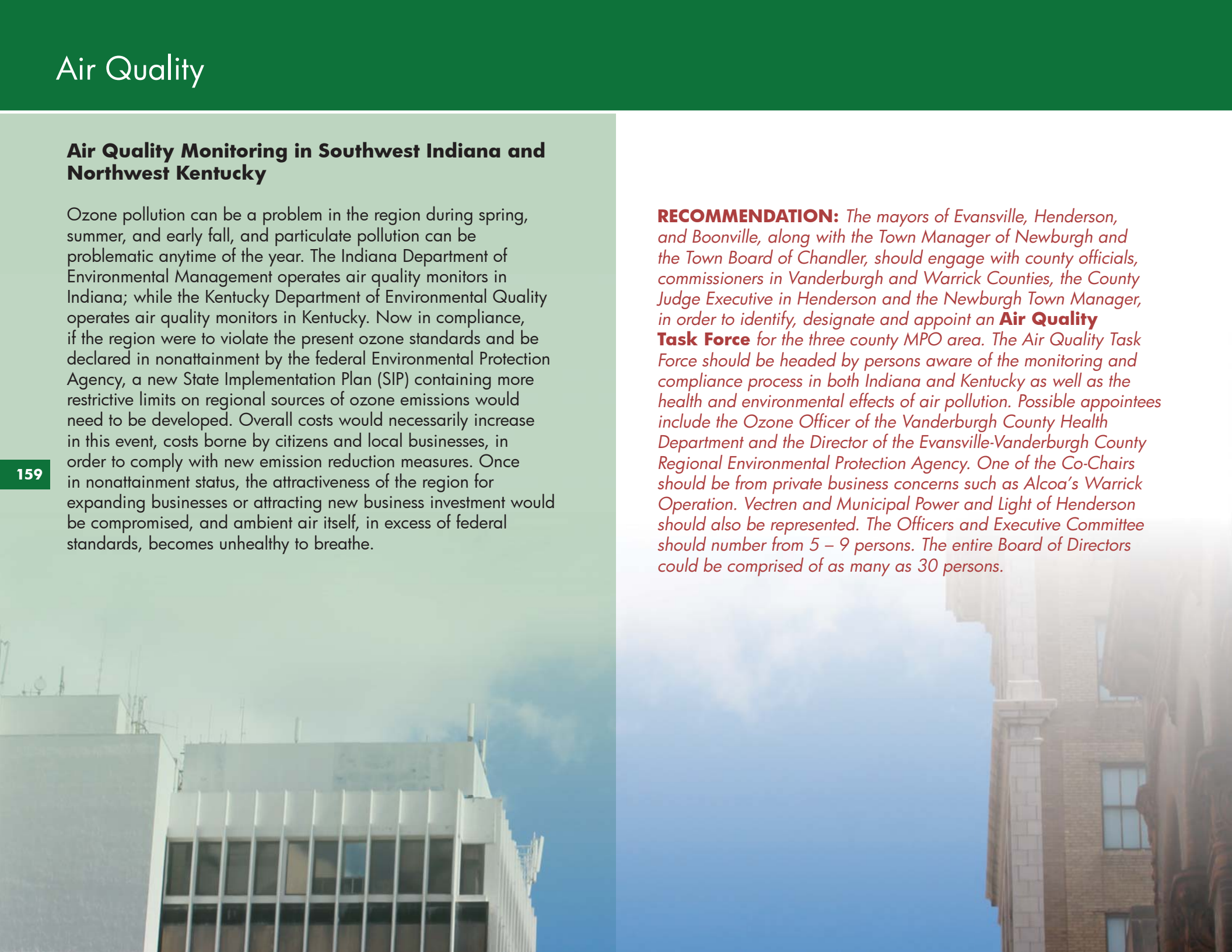
"A town is saved, not more by the righteous men in it than by the woods and swamps that surround it."

-Henry David Thoreau

Air Quality Monitoring in Southwest Indiana and Northwest Kentucky

Ozone pollution can be a problem in the region during spring, summer, and early fall, and particulate pollution can be problematic anytime of the year. The Indiana Department of Environmental Management operates air quality monitors in Indiana; while the Kentucky Department of Environmental Quality operates air quality monitors in Kentucky. Now in compliance, if the region were to violate the present ozone standards and be declared in nonattainment by the federal Environmental Protection Agency, a new State Implementation Plan (SIP) containing more restrictive limits on regional sources of ozone emissions would need to be developed. Overall costs would necessarily increase in this event, costs borne by citizens and local businesses, in order to comply with new emission reduction measures. Once in nonattainment status, the attractiveness of the region for expanding businesses or attracting new business investment would be compromised, and ambient air itself, in excess of federal standards, becomes unhealthy to breathe.

RECOMMENDATION: *The mayors of Evansville, Henderson, and Boonville, along with the Town Manager of Newburgh and the Town Board of Chandler, should engage with county officials, commissioners in Vanderburgh and Warrick Counties, the County Judge Executive in Henderson and the Newburgh Town Manager, in order to identify, designate and appoint an* **Air Quality Task Force** *for the three county MPO area. The Air Quality Task Force should be headed by persons aware of the monitoring and compliance process in both Indiana and Kentucky as well as the health and environmental effects of air pollution. Possible appointees include the Ozone Officer of the Vanderburgh County Health Department and the Director of the Evansville-Vanderburgh County Regional Environmental Protection Agency. One of the Co-Chairs should be from private business concerns such as Alcoa's Warrick Operation. Vectren and Municipal Power and Light of Henderson should also be represented. The Officers and Executive Committee should number from 5 – 9 persons. The entire Board of Directors could be comprised of as many as 30 persons.*



The mission of the Task Force will be to reduce emissions and improve air quality, setting reachable goals and monitoring progress toward these measurable goals. The approach taken by the Air Quality Task Force (also called the Clean Air Task Force) includes education and outreach, as well as serving as a regional resource and advisor. The Air Quality Task Force could also sponsor and manage programs to increase local awareness of air quality issues. The following listing gives an overview of potential tasks the Air Quality Task Force could undertake:

Role of the Air Quality Task Force

- **Present** information on health and economic impacts of air pollution on institutions and the various local governmental jurisdictions, as well as to civic organizations and private businesses.
- **Sponsor** a public forum for exchanging data and ideas concerning air quality issues. Conduct public surveys, if and when required.
- **Coordinate** a regional collaborative problem-solving process with elected officials, university scientists and students, business and industry leaders, and the general public.
- **Evaluate** emerging air quality topics in the region and monitor legislation at the federal, state and local levels.
- **Provide** businesses and citizens a wide range of opportunities for staying aware of the latest air quality technical and policy developments through a Technical Advisory Subcommittee, with regularly scheduled meetings.
- **Educate** the general public about air quality concerns and issues, plus new regulations applying to the tri-state area. Inform citizen groups as to ways they can help reduce harmful emissions.
- **Apprise** regional residents via e-mail, Facebook, Twitter, radio, newspaper, television and website postings when the Air Quality Index, which measures both particulates and ozone levels, is likely to reach harmful levels.

Solid Waste Handling and Recycling

According to statistics compiled by the federal Environmental Protection Agency, Americans generate, on average, approximately 4.6 pounds of waste each day and they average recycling approximately 1.5 pounds. The annual energy that is saved by recycling in this country equates to more than 10 billion gallons of gasoline. The two most common management strategies for handling municipal garbage are either constructing more landfills or exporting garbage to other communities. As population increases, landfills soon fill to capacity. With land growing scarcer and remonstrators growing louder, new landfills are more and more difficult to site. Whether siting or transporting, most municipalities, or their private waste handlers, will continue to face higher operations and transporting costs. These costs will include vehicle depreciation, labor in actual waste handling, vehicle fueling and maintenance, long-term costs of environmental degradation or groundwater pollution, plus administrative soft costs.

Regardless of the strategies selected for handling solid waste, a comprehensive sustainability plan should include a goal of reducing the amount of trash that enters the waste stream. There are a variety of ways to accomplish this necessary reduction: encouraging and facilitating recycling and reuse of materials; composting of organic waste, returning it to the earth; and converting waste into usable municipal energy sources. The term "waste-to-energy" is common parlance for many types of projects including the capture of landfill methane to be used directly as combustible fuel or indirectly in the production of electricity; diverting organics for processing in anaerobic digesters; or converting waste vegetable oil into biodiesel. As the waste stream gets reduced and converted, more land can be planned for other local services, and less of the taxpayers' money needs to be spent to pay for managing waste. An overall sustainable waste plan should encompass the 3 Rs of the waste stream – reduce, reuse, recycle. Allied Waste of Evansville contracted with Ameresco, Inc. to install a gas line that captures methane gas from the Laubscher Meadows landfill site and pipes it along St. Joseph Avenue to Mead Johnson/Bristol-Myers for use as an energy source. Allied Waste of Evansville is now called Republic Services, Inc.

In addition to the normal waste stream, there are hazardous materials that often get dumped into household trash bins, when they should be disposed of properly. These hazardous items may include paints, cleaning fluids and chemicals, batteries, electronics (E-waste) and light bulbs, some of which contain mercury. According to EPA figures, over 2 million tons of used or unwanted electronics are disposed of annually. Of this amount, in excess of 1.5 million tons are disposed of in landfills, while only 400,000 tons are generally recycled. There is great room for improvement, with E-waste strategies being an integral component of any regional sustainability planning efforts.

Construction debris and materials (C&D) originate from waste generated in building, road or bridge construction. While C&D is usually not accounted for in municipal solid waste figures, the actual waste stream typically includes building demolition and renovation materials, such as old carpeting and masonry that comes from remote construction sites. Construction, demolition, and renovation debris and waste (C&D) usually makes up about 20 percent of the total solid waste stream. Observing LEED guidelines on building construction sites can aid in keeping building off-fall and waste out of the general waste stream. Some communities have had success with setting up recycling centers that are strictly for construction waste, where concrete, brick and wood products are pulverized and recycled. Currently, the closest construction waste handling facility is in Velpen, Indiana, near Petersburg. The City of Henderson recently initiated a new city-county recycling center, and on August 1, 2013, the first load of material was processed at the center. The Henderson recycling center, however, does not accept bulk construction waste.

Most municipalities periodically conduct a waste audit as a first step in reducing the amount of garbage to be handled. The audit identifies opportunities for waste diversion, prevention and reduction, while increasing recycling. A review of historical data, if good records are kept, can help determine volumes of materials being discarded, how much of it gets recycled, and how much can be rerouted. A complete audit should include the costs associated with all phases of the waste handling process, and any and all resulting revenues. Once the basic inventory has been conducted and a baseline established, targets can be set, with associated numerical indicators. If full cost accounting methods are adhered to, and all costs associated with operating the municipal waste system are recorded, then local policy makers will be able to find areas where the process can be streamlined and improved.

Composting

Composting is an altogether natural process turning organic materials into a dark, rich humus. It is a very effective conditioner for topsoil. It improves physical, chemical, and biological aspects of soils and other growing mediums. While it does contain nutrients that enrich the soil, it is not generally considered a fertilizer product. Humus or "compost" is produced by the activity of aerobic or oxygen-requiring microorganisms. The microbes require oxygen, a food source, and the proper moisture before they can multiply. Microbes then generate their own heat, carbon dioxide and water vapor as raw material is converted to a stable soil conditioner.

Compost is produced from a variety of sources such as leaves, manures, food scraps and wet/soiled papers. Also, products marked as *certified biodegradable products* are acceptable as the basis or foundation for successful composting. State and federal regulations govern the labeling of certifiably safe and environmentally beneficial composts that are sold and distributed. According to the US Composting Council, there are at least four key reasons to compost:

1. **To make plants healthier** – Organic matter is known as the "soul of a healthy soil."
2. **To save your local community money** – Using compost as a mulch reduces the need to purchase commercial lawn and garden products.
3. **Composting is practical and handy** – There is no need to bag and dispose of leaves and other yard wastes. Just add them to the backyard compost pile.
4. **Composting is a good alternative to landfilling or incinerating** – In general, yard and garden wastes account for about 20 percent of the total trash that enters the waste stream. (Food waste is about 10 percent and the remainder, yard waste and other organic material makes up another 10 percent.) [1]

1 US Composting Council, Research and Education Foundation (CCREF), Lori Scozzafava, Executive Director, 5400 Grosvenor Lane, Bethesda, Maryland 20814

RECOMMENDATION: *The cities of Evansville, Henderson, and Boonville, along with the towns of Newburgh and Chandler, should collaborate in conducting waste audits, if they have not done so within the last five years, in order to assess magnitude of waste and to evaluate present programs and contracts for their waste handling operations. If auditing confirms national percentages for construction materials (20 percent) and organic materials (mostly garbage & food waste), the Solid Waste District should explore the possibility of establishing a local recycling center devoted strictly to construction waste handling and recycling. For organic food waste (commonly 10 percent of the waste stream), pilot programs with participating hospitals, schools, corporations with food service cafeterias, and nursing homes should be devised for local composting of food waste generated in these institutional facilities.*

Watershed Management and Planning

Watershed Management is a key component of a successful **Green Infrastructure Plan**. At the three-county regional scale, the Green Infrastructure can be defined as a multifunctional, connected open space network providing multiple benefits for people, from healthy respiration to the filtering of unwanted carcinogens, or enhancing of the aesthetics of the natural and built environment. At a more localized scale, at the block or neighborhood level, Green Infrastructure can be defined as a stormwater management approach that imitates natural hydrology, optimizing natural percolation, recharging the water table, scrubbing airborne pollutants, sequestering carbon, and nourishing wildlife. These naturally passive functions are also supplemented by more active uses such as recreation, movement and connectivity via trails and bikeways, food and fiber production, and the social cohesion that can come from group activities and participation.

In summary, there are at least ten broad areas where Watershed Management drives the Green Infrastructure Plan and provides direct benefits to local communities. These benefits are:

- **Channeling** stormwater naturally, thereby reducing runoff, flooding, topsoil loss and erosion.
- **Removing** harmful pollution from both the water and ambient air.
- **Lessening** the urban heat island effect (which is responsible for much of the warming in urban areas), while contributing to energy conservation.
- **Preserving and restoring** natural ecosystems while providing habitat for native species of flora and fauna.
- **Reducing** fossil fuel emissions from vehicles, lessening energy consumption by buildings, and sequestering tons of carbon.
- **Reducing** the costs of energy, healthcare and concrete infrastructure, thereby making public funds available for other important initiatives.
- **Promoting** healthier lifestyles and stemming obesity through outdoor recreation, walking, and biking opportunities.
- **Hosting** social gatherings and outdoor events that build community spirit and bring people together.
- **Making** a major contribution to the aesthetic quality of both urban and suburban development.
- **Yielding** local food, fiber and filtered water.

The Green Infrastructure concept is directly related to the discipline of Landscape Ecology. Some of the working terms and definitions common to Green Infrastructure and Landscape Ecology are cited in the American Planning Association report called *Green Infrastructure: A Landscape Approach*. The following passage is instructional.

> "Commonly referred to as a 'hub' or 'node' by planners and designers of green infrastructure systems, a 'patch' is defined by landscape ecologists as a discrete area of the landscape that differs from its surroundings (e.g., a park or natural reserve). A 'corridor' is a linear element that links natural habitat patches. Riparian habitat along a river or stream is a common example, while roadways are important corridors in urban and suburban landscapes. An 'edge' is the transition area between different landscape elements (e.g., patches and corridors). Finally, the 'matrix' is the overall landscape structure or pattern within which patches, corridors, and edges are embedded. While green infrastructure network design typically focuses on creating hubs and connecting corridors (often called links), the role of the matrix is fostering connectivity – e.g., an urban or suburban community with a healthy urban forest – should not be overlooked." [2]

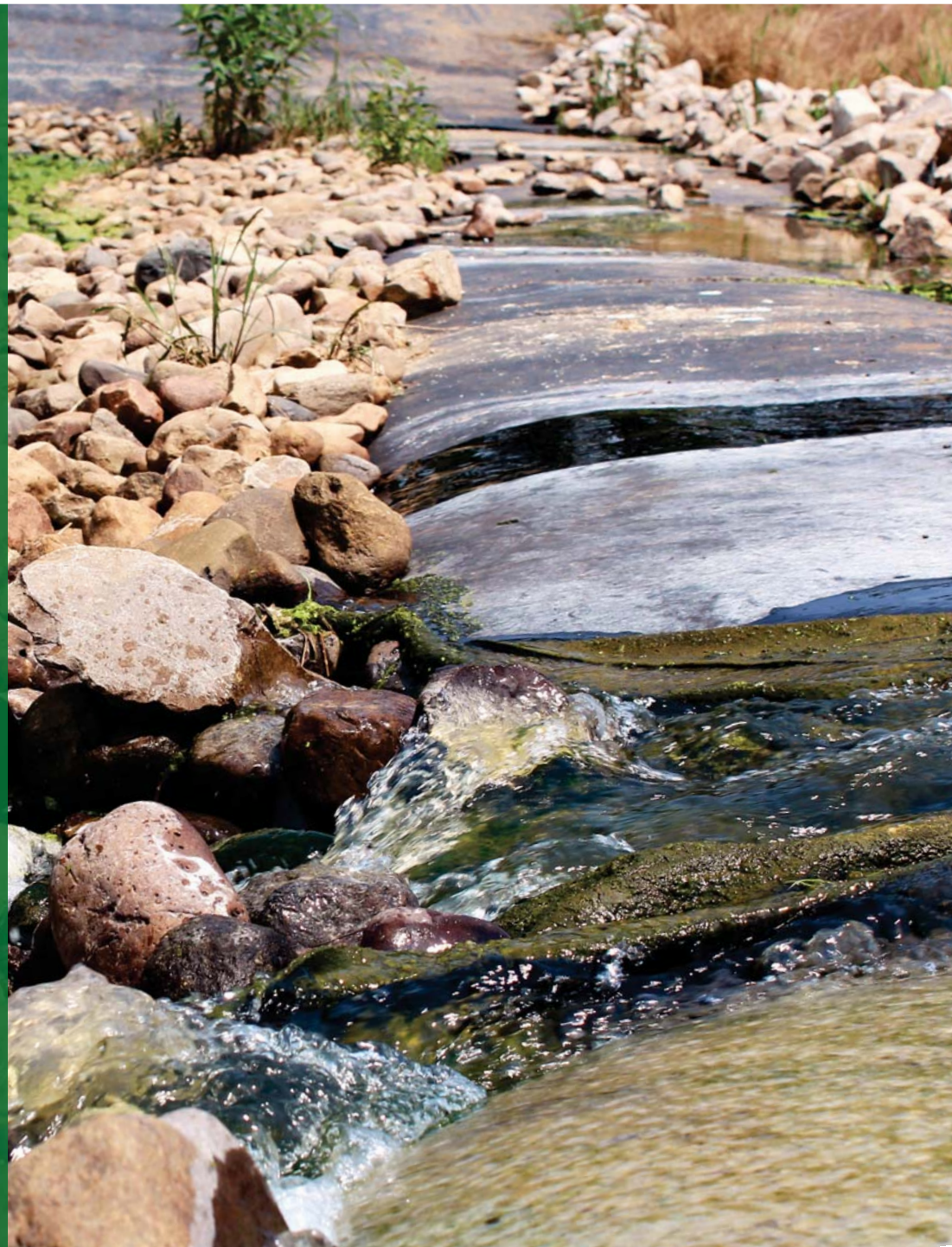
2 *Green Infrastructure: A Landscape Approach*, by David C. Rouse, AICP, and Ignacio F. Bunster-Ossa, American Planning Association, Planning Advisory Service Report Number 571, Research Department of APA, January, 2013

Watershed Planning

Watershed Plans

The US Environmental Protection Agency (EPA) has, for many years, encouraged states and localities to develop watershed plans to help protect and restore water resources. The EPA predicts that communities all over the US will need to spend over $150 billion to protect water quality and provide potable water to residents. [3] Due to the highly complex and disaggregated nature of nonpoint source pollution, plus the significant costs to address it, watershed measures are frequently implemented through voluntary measures taken by individual property owners. Addressing nonpoint source pollution can often require years of support from an organized coalition of owners, stakeholders, and watershed officials, all funneled through a variety of funding sources. But, in the end, localities can minimize their capital costs for constructing expensive public drainage and water works facilities by preserving and managing watershed land for source water protection.

The preservation of key watershed open space upstream helps protect water resources by the natural screening process whereby contaminants and chemical pollutants are filtered out well before they enter the community's drinking water systems. Areas that are critical to the process of this natural filtering include wetlands, stream buffer zones, riparian corridors and floodways. Wetlands are an integral part of the natural filtration process by acting as natural water processing plants. As water flow rates are slowed by plant materials and non-eroded topsoil percolation, the sediments carried by water flows are settled out naturally, making the water much cleaner before it enters the municipal treatment structures.



3 US EPA "Drinking Water Infrastructure Needs Survey" http://www.epa.gov/safewater/needs.html

Good advanced watershed planning can help address water quality problems holistically by first assessing potential causes and sources of water pollution and then prioritizing restoration and protection measures. According to EPA guidelines there are eight key steps in the Watershed Planning and Implementation Process:

1. **Building** Lasting Partnerships
2. **Characterizing** and Quantifying the Watershed
3. **Finalizing** Goals
4. **Identifying** Potential Solutions
5. **Designing** an Appropriate Implementation Program
6. **Implementing** the Shared Watershed Plan
7. **Measuring** and Tracking Indicators of Progress
8. **Making** Incremental Adjustments.

The EPA also prescribes ten minimum elements that must be included in section 319-funded Watershed Plans for threatened or impaired waters:

1. **Identifying** causes and sources of pollution
2. **Tabulating** pollutant loading in the watershed and planned load reductions
3. **Describing** management measures that will achieve load reductions
4. **Targeting** and prioritizing critical geographical areas
5. **Estimating** amounts of technical and financial assistance and the relevant authorities needed to implement the plan
6. **Developing** an information/education component
7. **Devising** a project schedule
8. **Describing** the interim, measurable milestones
9. **Identifying** indicators to measure progress
10. **Instituting** a monitoring component. [4]

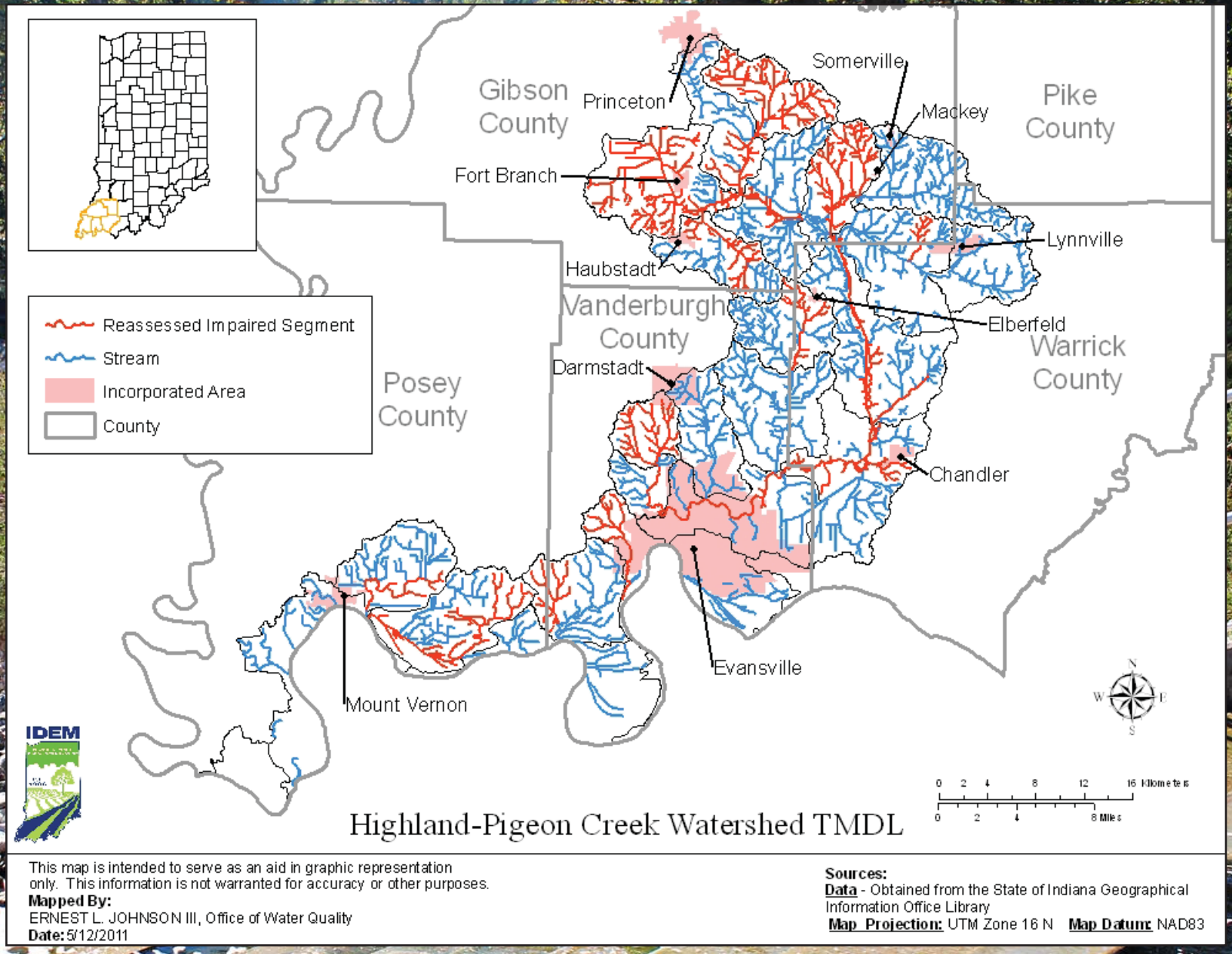
4 "A Quick Guide to Developing Watershed Plans to Restore and Protect Our Waters," United States Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Nonpoint Source Control Branch (4503T), Washington, DC, May 2013

Watershed Planning

State agencies involved in setting water quality standards and monitoring watersheds are the **Kentucky Energy and Environment Cabinet, Water Quality Branch (WQB)**; and the **Indiana Department of Environmental Management (IDEM)** and its **Watershed Monitoring Program**. IDEM completed its initial comprehensive aquatic life use support assessments for the State of Indiana in 2002 and reported similar information for recreational uses in 2010. The 2002 document was the state's first baseline report on overall state water quality, and it was revised in 2004, 2006 and 2008. Causes of impairments are reported for each waterbody type including rivers, lakes, and Lake Michigan's associated shoreline in Indiana. Pathogens are the main cause of stream impairments, affecting over 8,000 miles of streams. PCBs in fish tissue impacts over 3,000 miles of streams, while mercury impairments impact close to 2,000 miles of streams. IDEM's Office of Water Quality, through its Total Maximum Daily Load Program (TMDL) published a report on July 28, 2011 analyzing the Highland-Pigeon Creek Watershed. The study measured total phosphorous and E. coli loads in the tributaries that contribute to this watershed area. The study identified load duration curves and sections of impaired waterways and estuaries, along with phosphorous and E. coli counts at specified sample sites. See Figure 5-1 for Highland-Pigeon Creek impaired streams, designated in red.

The Kentucky Division of Water's **Water Quality Branch (WQB)** is responsible for monitoring and assessing the quality of water in Kentucky's waterbodies, streams, lakes and wetlands. The **WQB** revises water quality standards and criteria, classifies surface waters for their various uses and interprets standards for Kentucky Pollutant Discharge Elimination System permitting. The WQB also serves as advisors for the Division of Water on many topics related to environmental emergencies such as spills and evaluation of scientific data.

Figure 5-1: Impaired Streams



This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped By:
ERNEST L. JOHNSON III, Office of Water Quality
Date: 5/12/2011

Sources:
Data - Obtained from the State of Indiana Geographical Information Office Library
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

Combined Sewers

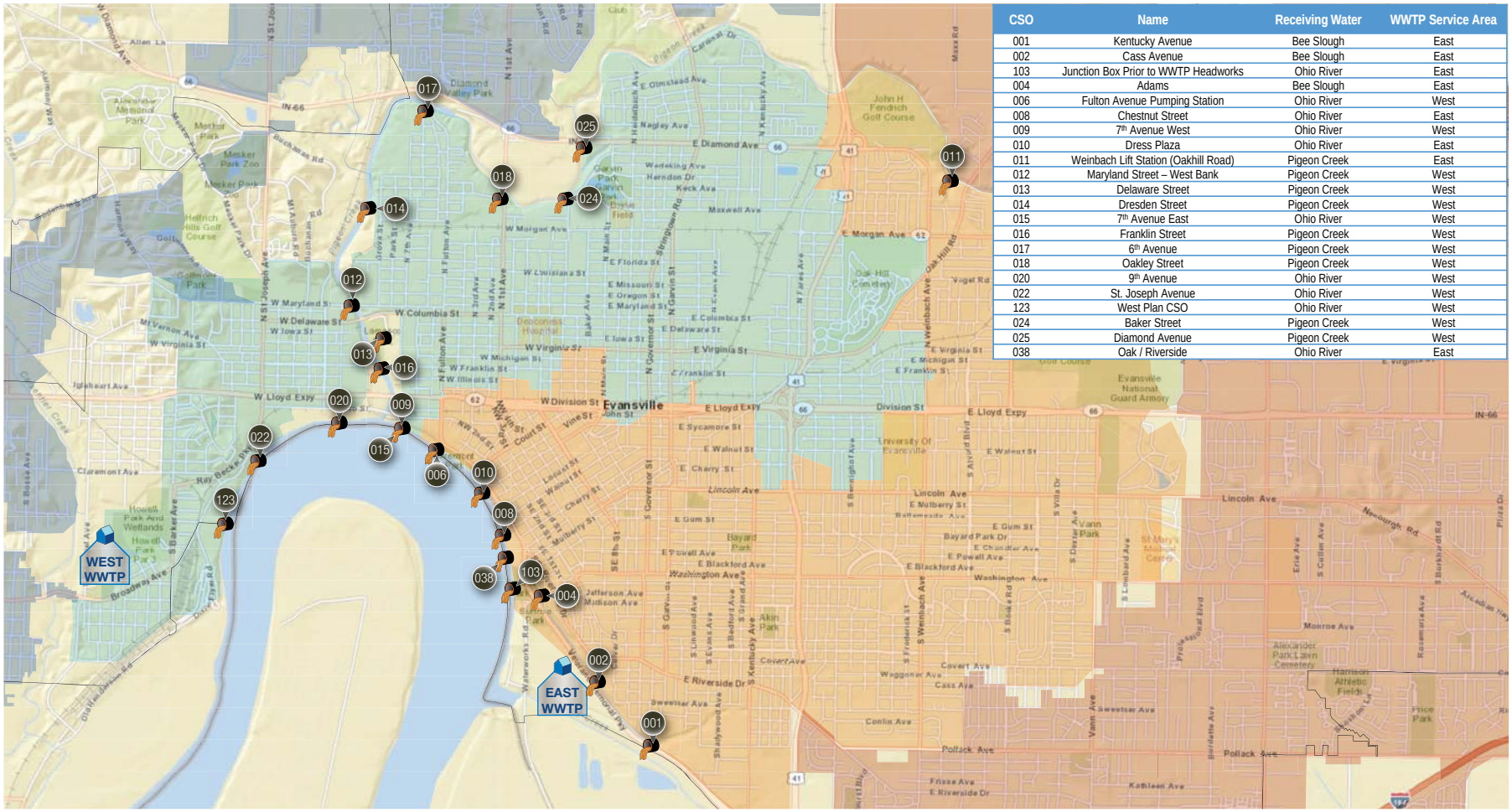
The Henderson Municipal Water Utility maintains and upgrades sewers in Henderson County. Some of the oldest sewer lines in the City of Henderson were constructed between 1880 and 1960. Most of the sewers built in that time period were designed and constructed to be combined sewers handling both sanitary sewage and stormwater runoff in the same piping. During heavy rain events, the capacity of the combined sewer system may be exceeded due to excess of stormwater runoff entering the system. Also built into the system of combined sewers are combined sewer overflows (CSOs), engineered to discharge the mixture of wastewater and stormwater into the city's designated receiving waters. These "outfalls" are generally located along the Ohio River and the downstream side of Canoe Creek. The **Henderson Water Utility (HWU)** has completed several separation projects in the past ten to fifteen years in order to eliminate problematic overflows. The HWU is planning for additional projects in the future. In the meantime, the utility has posted CSO warning signs at all locations where overflows occur during periods of heavy rainfall.

The municipal sewer system in Evansville consists of 500 miles of sanitary sewer and about 318 miles of combined sewers, all under the authority of the **Evansville Water and Sewer Utility (EWSU)**. Combined sewers mainly serve the older parts of Evansville, while outlying suburban and exurban areas are served by separate sanitary and storm sewers. However, sanitary sewage from the near-urban and suburban areas eventually flows through the combined sewer system before it reaches one of the main treatment plants. When the capacity of the wastewater treatment plant is exceeded, usually during heavy rain events, the excess water is allowed to bypass the treatment plant and discharge into the Ohio River or the Pigeon Creek, through flow diversion structures. The combined sewer overflow (CSO) system in Evansville is located in the south central area of the city. The area is generally bounded by the Ohio River on the south, Pigeon Creek on the north, Carpenter Creek on the west and Vann Avenue on the east. The system itself includes nine CSOs that discharge to Pigeon Creek and thirteen that discharge to the Ohio River. (See Figure 5-2.)

In October of 2006, the Mayor of Evansville formed an Evansville Storm Water Task Force consisting of 15 members. Six were appointed by the Mayor, six by the City Council, and three by United Neighborhoods of Evansville (UNOE). The Task Force oversaw the development of a Long Term Control Plan (LTCP) to eliminate, or at least minimize, the need for CSOs. They also began assisting city officials in negotiating, with the federal government, a Consent Decree that would legally bind Evansville to complete projects in the LTCP within a 20 year window. In early 2011, the City of Evansville agreed to the Consent Decree requiring the city to improve its sewer and water operations and maintenance; to develop and implement a comprehensive plan to increase capacity of its sewer systems in order to minimize and eliminate the CSOs; and, if otherwise required, to meet the Clean Water Act, to upgrade the treatment capacity of its two wastewater treatment plants. Costs for the total program are likely to exceed $500 million, and must be completed by 2032 – 2037, depending on Evansville's financial health leading up to that period.

Natural Green Infrastructure strategies can support compliance with the Consent Decree, while saving costs of expensive "gray infrastructure" systems. The Evansville Water and Sewer Utility is evaluating Green Infrastructure strategies at this writing.

Figure 5-2: Evansville CSO Locations



CSO	Name	Receiving Water	WWTP Service Area
001	Kentucky Avenue	Bee Slough	East
002	Cass Avenue	Bee Slough	East
103	Junction Box Prior to WWTP Headworks	Ohio River	East
004	Adams	Bee Slough	East
006	Fulton Avenue Pumping Station	Ohio River	West
008	Chestnut Street	Ohio River	East
009	7th Avenue West	Ohio River	West
010	Dress Plaza	Ohio River	East
011	Weinbach Lift Station (Oakhill Road)	Pigeon Creek	East
012	Maryland Street – West Bank	Pigeon Creek	West
013	Delaware Street	Pigeon Creek	West
014	Dresden Street	Pigeon Creek	West
015	7th Avenue East	Ohio River	West
016	Franklin Street	Pigeon Creek	West
017	6th Avenue	Pigeon Creek	West
018	Oakley Street	Pigeon Creek	West
020	9th Avenue	Ohio River	West
022	St. Joseph Avenue	Ohio River	West
123	West Plan CSO	Ohio River	West
024	Baker Street	Pigeon Creek	West
025	Diamond Avenue	Pigeon Creek	West
038	Oak / Riverside	Ohio River	East

Legend

East Service Area
- Separate Sewer Area
- Combined Sewer Area

West Service Area
- Separate Sewer Area
- Combined Sewer Area

- Wastewater Treatment Plant
- CSO
- City Limits

North

FIGURE 2-2
Evansville CSO Locations
Long Term Control Plan
May 31, 2013

renewEVANSVILLE

WBG073012083042IDA EVANSVILLE

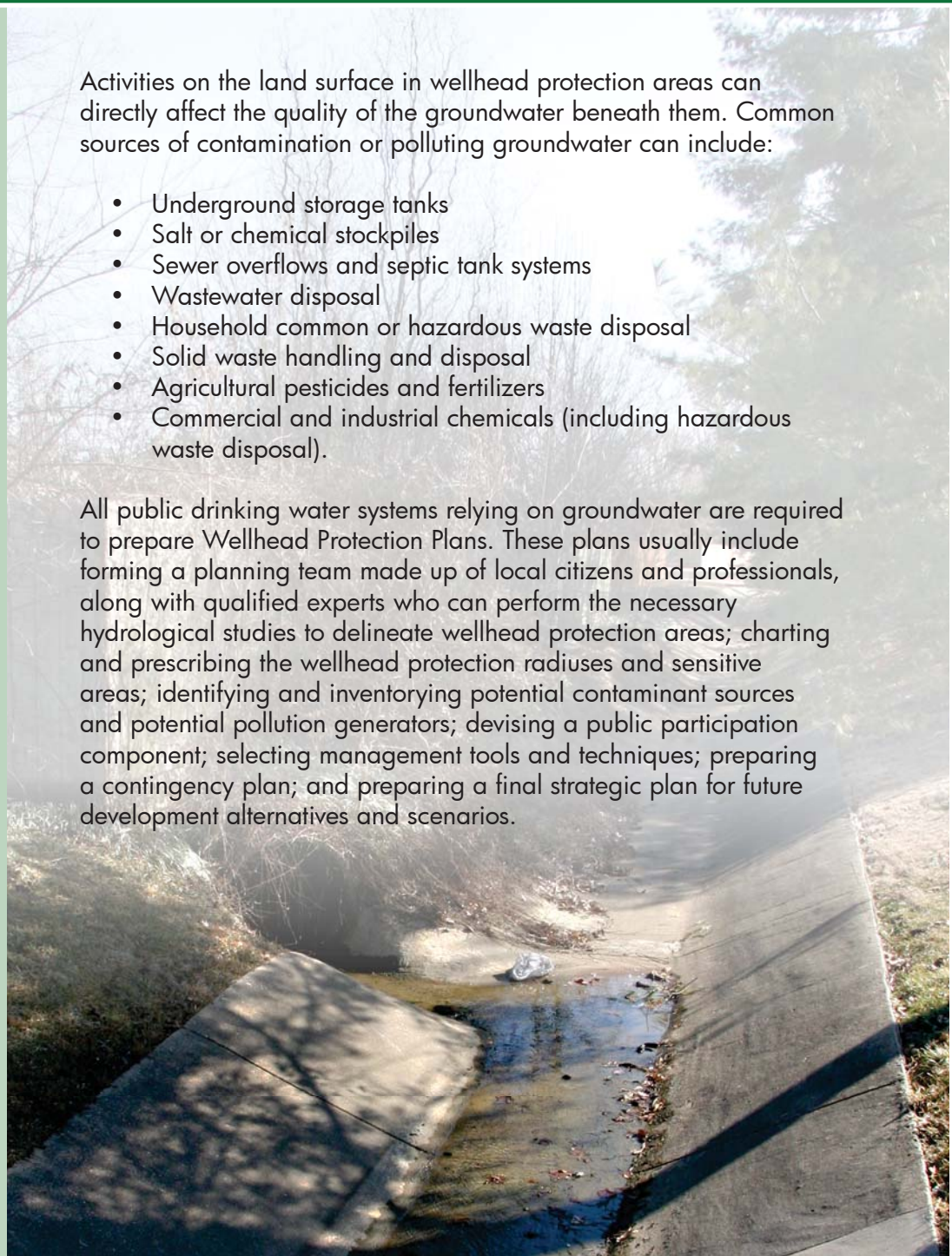
Wellhead Protection

According to the Indiana Geological Survey, somewhere between 60-72 percent of Indiana's population depends on groundwater as a source for drinking and miscellaneous household uses. Contaminated well water can pose a significant human health hazard. In the State of Kentucky, at least one-half of Kentucky's aquifers occur in karst regions (land areas containing sinkholes, caves, springs, disappearing streams, and few or no surface streams). Likewise, southwest Indiana contains both unconsolidated sand and gravel deposits, along with karst aquifers. The groundwater in these karst areas is highly susceptible to pollution. People living in regions where karst aquifers predominate must be extremely careful that their activities do not pollute the groundwater beneath them. The surface water in karst areas quickly becomes groundwater as surface runoff flows into sinkholes, or a stream disappears underground. In the three county EMPO region, two of the counties, Vanderburgh and Henderson, as well as Posey County to the west of Evansville, are serviced by treated water that originates from the Ohio River. Warrick county and some areas in the northern reaches of the Lower Wabash watershed in Indiana and in southern portions of the Lower Green watershed in Kentucky directly depend on well water for drinking. Water providers in the communities of Boonville, Campbellsville, Chandler, Newburgh, Yankeetown, and Reo have filed Wellhead Protection Plans with the Indiana Department of Environmental Management.

Activities on the land surface in wellhead protection areas can directly affect the quality of the groundwater beneath them. Common sources of contamination or polluting groundwater can include:

- Underground storage tanks
- Salt or chemical stockpiles
- Sewer overflows and septic tank systems
- Wastewater disposal
- Household common or hazardous waste disposal
- Solid waste handling and disposal
- Agricultural pesticides and fertilizers
- Commercial and industrial chemicals (including hazardous waste disposal).

All public drinking water systems relying on groundwater are required to prepare Wellhead Protection Plans. These plans usually include forming a planning team made up of local citizens and professionals, along with qualified experts who can perform the necessary hydrological studies to delineate wellhead protection areas; charting and prescribing the wellhead protection radiuses and sensitive areas; identifying and inventorying potential contaminant sources and potential pollution generators; devising a public participation component; selecting management tools and techniques; preparing a contingency plan; and preparing a final strategic plan for future development alternatives and scenarios.




NEWBURGH
INDIANA
AMERICAN WATER

Wellhead Protection

Zoning and subdivision regulations have traditionally been used as regulatory tools to reduce or eliminate the negative impacts that land uses can have on groundwater and drinking water. In karst areas, low intensity land uses such as parks and open space are preferred over higher density building development. Within defined wellhead protection areas, the following subdivision and land use controls can be used:

- **Limiting** direct discharge of runoff from subdivisions into streams or wetlands
- **Requiring** very large lots in rural areas where septic systems may be utilized
- **Setting** performance standards with thresholds for the storage of potential contaminants or limitations on nitrogen and phosphorus loading
- **Requiring** areas near sensitive karst regions or wellhead protection zones to submit plats or planned unit development plans that cluster residential units well outside the areas of concern
- **Utilizing** overlay zones to establish additional specialized land use regulations in areas where special engineering treatment may be required
- **Prohibiting** problematic land uses and activities in karst and defined wellhead protection zones.

RECOMMENDATION: *In order to benefit from a coordinated regional approach to water quality, to derive potential savings in fees, and to avoid duplication of services, communities in Warrick County that are dependent on groundwater should select a hydrological consulting company that can review the status of their Wellhead Protection Plans to determine if all state and federal regulations for the delineation of Wellhead Protection Areas are in compliance. The consultant should prepare a report that discusses the status of Wellhead Protection in Warrick County, complete with recommendations for the next steps the individual communities can take to either stay in compliance, or with remediation, come into full compliance. The professional consulting company should also be capable of suggesting appropriate controls or local ordinances to address Wellhead Protection by private developers.*

Figure 5-3: Warrick County Unconsolidated Aquifer Systems

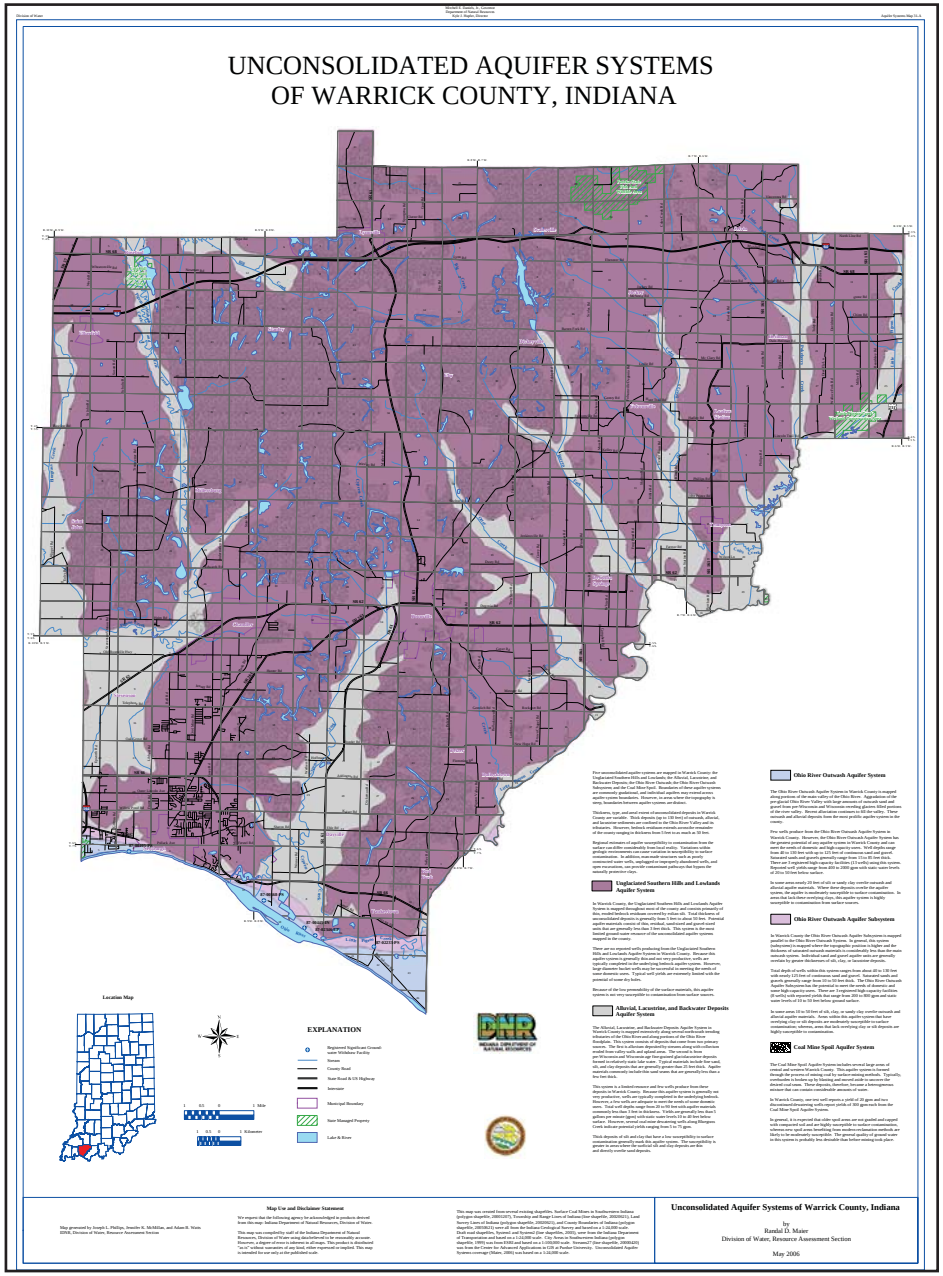
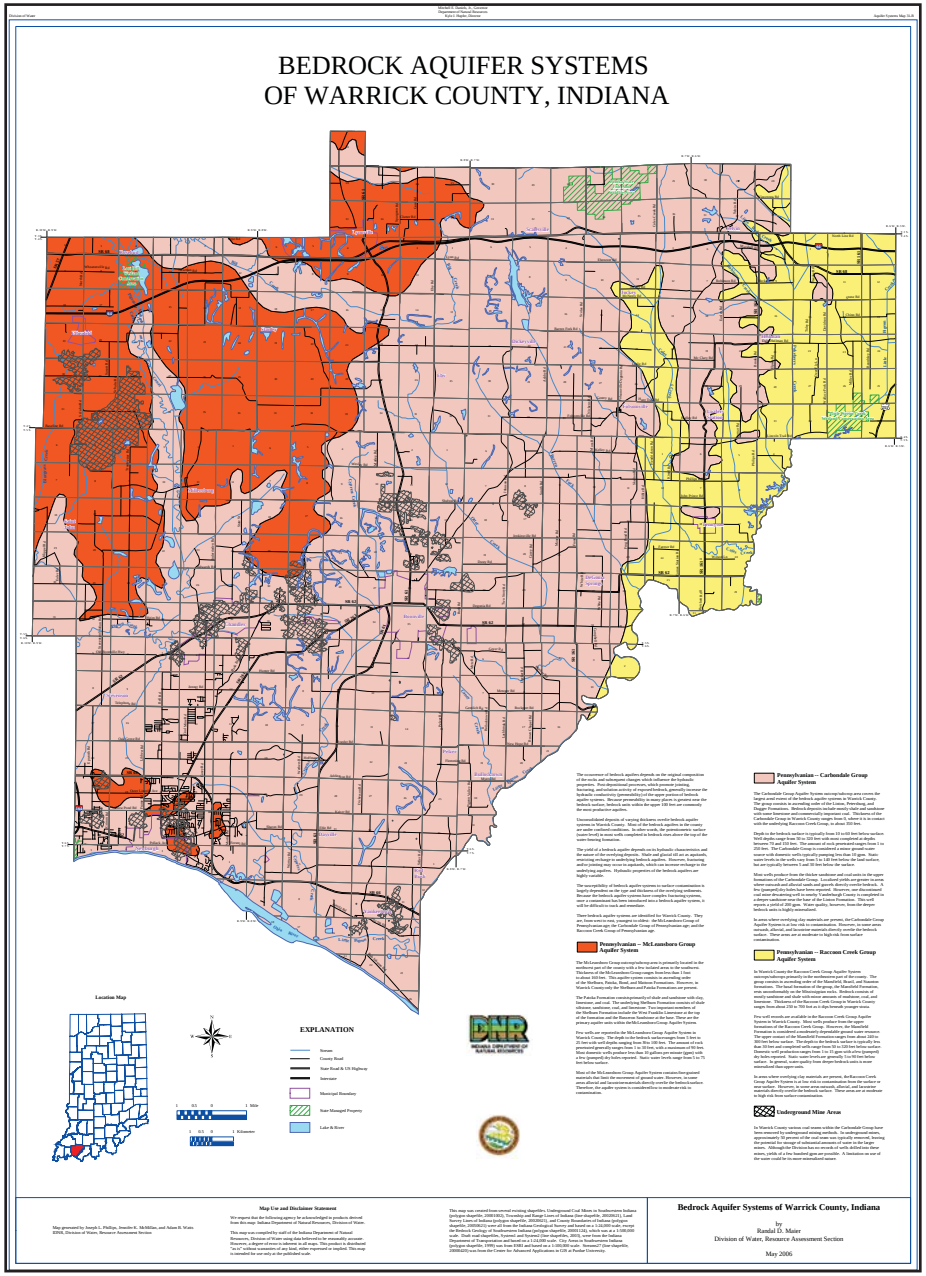


Figure 5-4: Warrick County Bedrock Aquifer Systems



Solar Farms (Photovoltaic Power Stations)

With capital costs falling significantly over the past decade, solar photovoltaic power stations are likely to reach grid parity with other alternatives such as coal and gas within the next ten to fifteen years. Judging from past fueling trends, by 2025 solar technologies, scaled up to make substantial contributions to electrical energy grids, appear to be an inevitable municipal energy source….especially in light of the rising cost of competing fossil fuels. Most American solar farms have been developed in southwestern states. These farms are usually built to contribute at least one (1) megawatt of power to their local power grids. Widespread installations in Europe include several hundred in Germany that exceed one (1) megawatt. To this point, most all of these solar farms have been subsidized with regulatory incentives like feed-in tariffs, loan guarantees, or tax credits. [5] Vectren estimates that in the next 20 years, they are likely to have about 8 megawatts of solar power throughout their entire service area.

The land area required for solar farms depends on their location, the efficiency of the solar modules being used, the site's slope and the type of mounting used – whether fixed tilt or on axis trackers. They will usually require between one (1) to two (2) hectares of land for each megawatt of rated output. [6] Solar installations are usually relatively low in maintenance requirements, as compared to other systems that rotate or oscillate, such as wind turbines or hydroelectric installations.

Solar farms are best situated in locations whose land is not suitable for other productive uses, such as large expanses of perimeter airport buffer zones, strip-mined lands being reclaimed or agricultural areas subject to flooding.

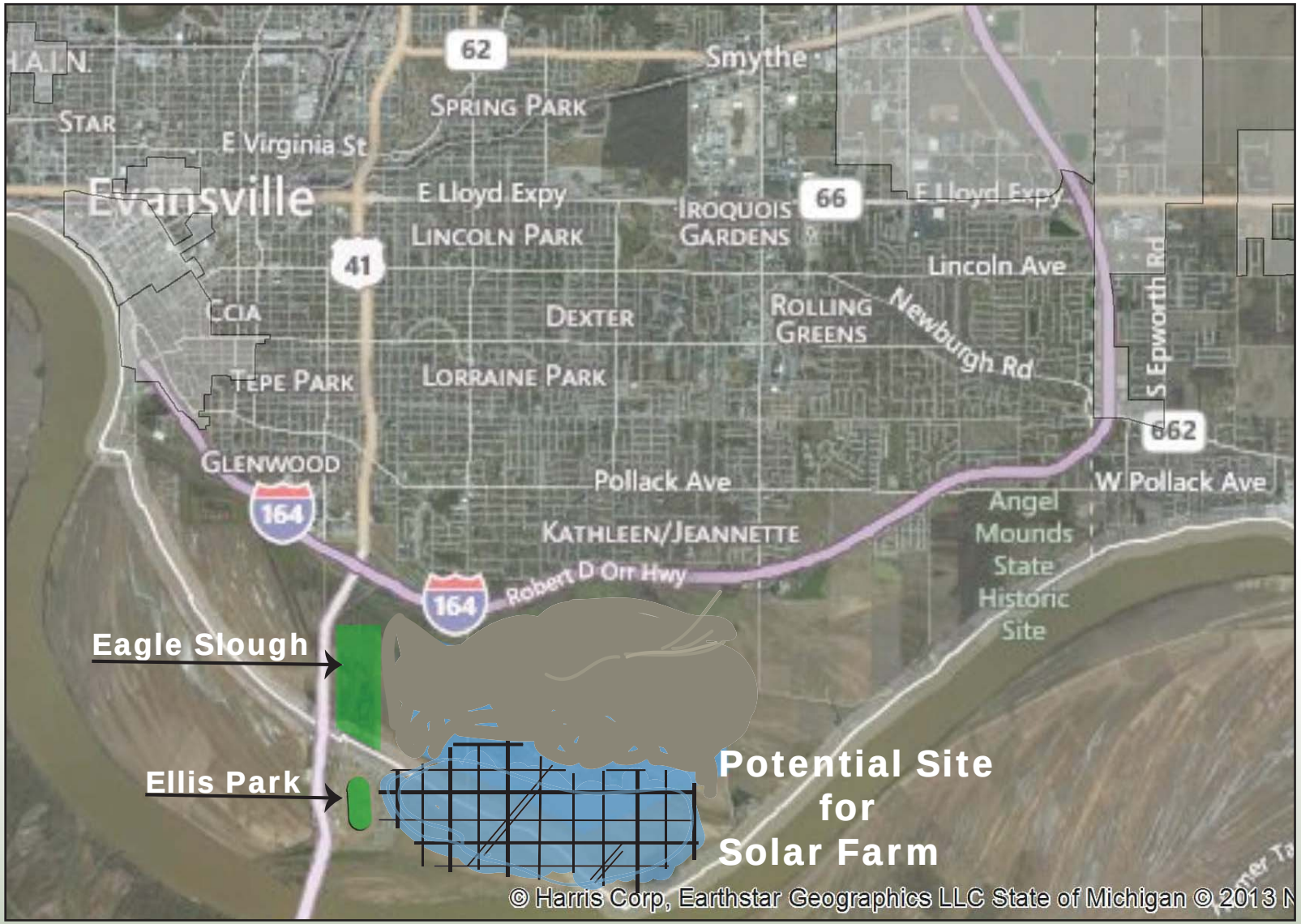
5 Solar parks map – Germany [http://www.wiki-solar.org/map/country/index.html?Germany?EU-WN-DE] Wiki-Solar
6 "Statistics about some Selected Markets for Utility-scale Solar Parks," [http://www.wiki-solar.org/analysis/index.html] Wiki-Solar

Most of the solar farms in existence are owned by independent power producers, though a few are held by investor- or community-owned utilities. The majority of farms are initially designed and constructed in a partnership with "specialist" project developers, who have a track record of successful farm development. These specialists will plan the project, obtain proper permits and connection consents with the power companies, and even arrange financing to provide the required capital. [7]

RECOMMENDATION: *As solar photovoltaic power reaches grid parity with non-renewable fossil fuels, Henderson Municipal Power and Light should investigate construction of a solar farm in the river bottoms east of Ellis Park, at a minimum of one (1) megawatt at the beginning. Vectren should, likewise, investigate potential sites in areas previously strip-minded in Warrick County. Power companies should devise a plan for regular expansion of the solar farms by phased sequencing, as power demands grow in the region. Regional power suppliers should also investigate joint ventures with one another to serve communities on both sides of the Ohio River with power derived from renewables.*

7 "The Crowded Field of Solar Project Development," by Ucilia Wang, in Renewable Energy World, August, 2012

Figure 5-5: Solar Farm



Green Roofs

Green roofs can deliver a wide range of social, environmental, and economic benefits over normal dark gray or black roofs often found in urban areas. A green roof system, by definition, should encompass a very high-quality waterproofing/root-repelling system, an effective and foolproof drainage system, some form of filter cloth, a lightweight growing medium (the soil base), and extremely carefully selected plants. All green roofs are capable of providing basic infrastructure services like stormwater management (by delaying the water from reaching storm sewers), outdoor air conditioning by cooling what would otherwise be a "hot roof," and substantial air quality improvement. An emerging trend in green roofing is to use rooftops to grow food, and thereby provide additional employment associated with the planting, maintenance, harvesting, processing, sale, and distribution of produce. Other functions include green roofs atop hospital buildings, used to provide opportunities for patients to heal through horticultural therapy and for nurses, doctors and staff to relieve stress. Schools are effectively programming green roofs with science class experiments, while businesses are using them as outdoor amenities for their employees to use during lunch or on breaks.

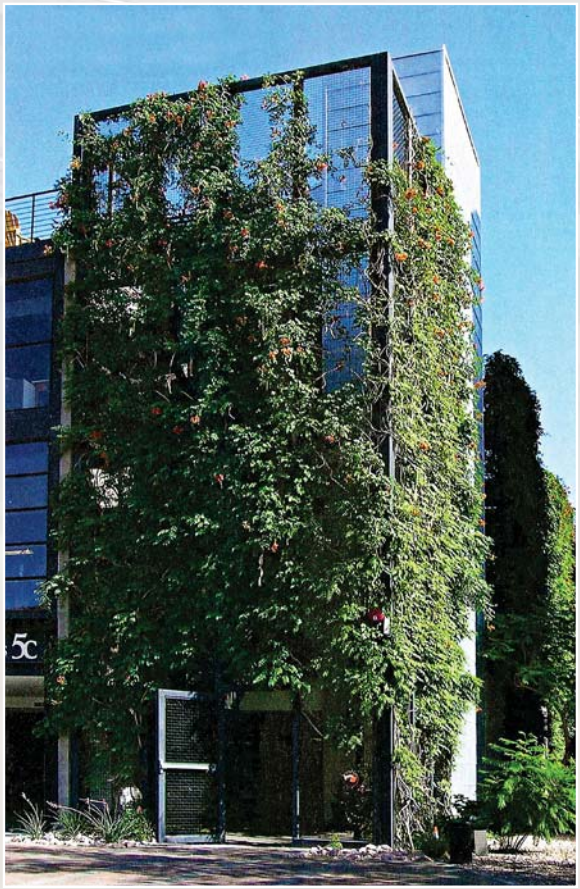
Since 2004, the Green Roofs for Healthy Cities (GRHC), which is the North American green roof and wall trade association, based in Toronto, has surveyed North America to collect data on the growth of green roofs and the composition of the industries who are providing green roofs to private corporations and public institutions. The 2012 Green Roof Industry Survey found that the green roof industry in North America grew by 115 percent in 2011, compared with 2010 when the growth rate was only 29 percent. An expanding industry, the green roof movement holds considerable promise for contributing significantly to the green-building movement, utilizing often underused spaces on the roofs and walls of urban buildings in our cities. [8]

8 "Green Roofs Make Healthy Cities," by Steven W. Peck, GRP, President of Green Roofs for Healthy Cities, Toronto, in Commercial Building Products Magazine, October 2012

Green Buildings

RECOMMENDATION: *Adopt a local building ordinance, enforced by the local Building Commissioner and Code Enforcement Inspectors, requiring all municipally owned or occupied new construction and renovation projects over 5,000 square feet with a total construction cost of more than $250,000; and all new city-funded construction and renovation projects over 10,000 square feet with a total construction cost of $250,000 or more, to be LEED Silver certified, or its documented equivalent.*

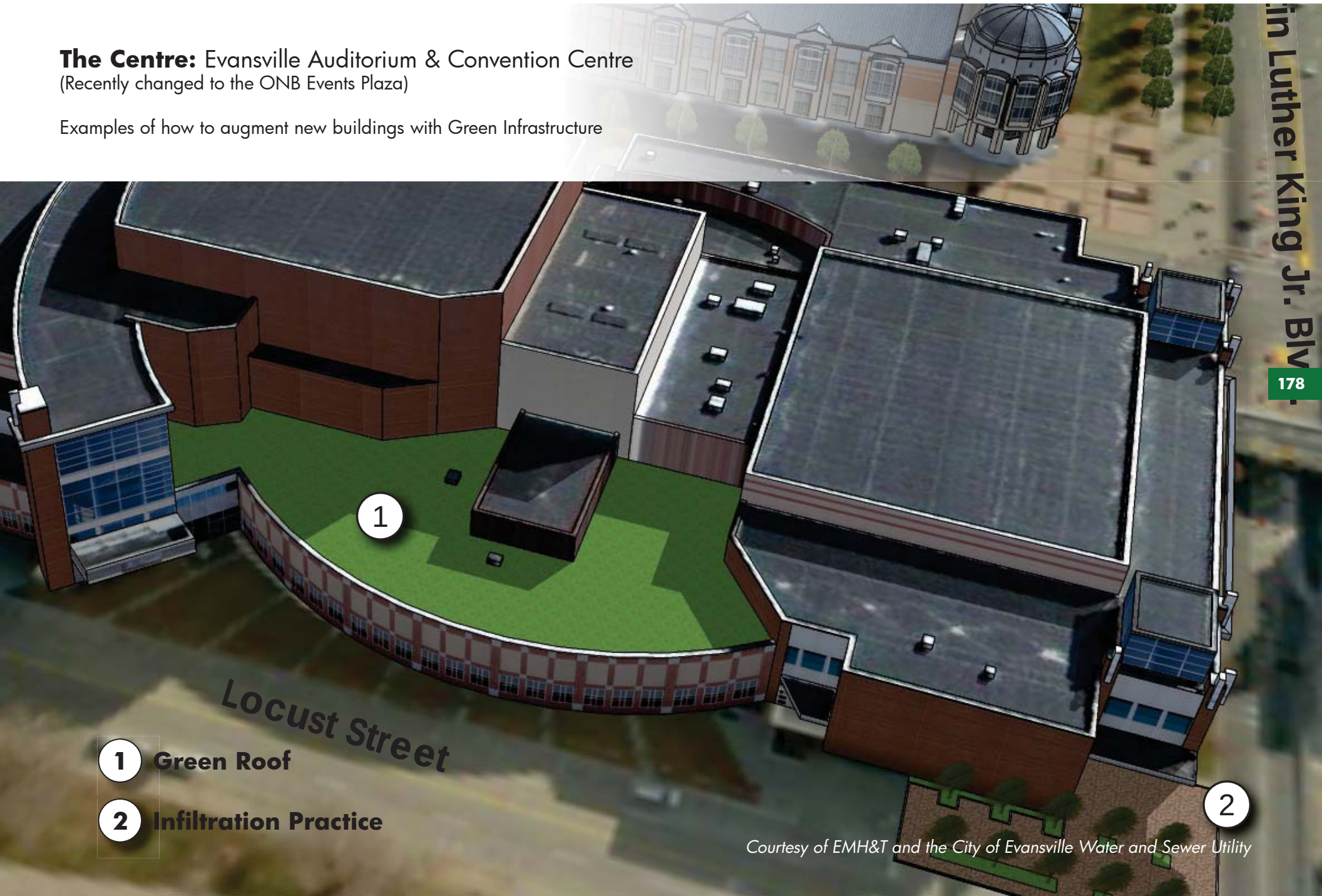
RECOMMENDATION: *Investigate state and federal grants available for applying green roofs to municipal buildings in Evansville, Henderson, Newburgh and Boonville. Buildings such as the Evansville Civic Center, Evansville-Vanderburgh Convention Centre, Victory Theatre, Central Library, Ford Center and Main Street Walkway in Evansville, plus public buildings and private structures along Main Street in Henderson are prime candidates for retrofitting with green roofs.*



Courtesy of Greenscreen Company

The Centre: Evansville Auditorium & Convention Centre
(Recently changed to the ONB Events Plaza)

Examples of how to augment new buildings with Green Infrastructure



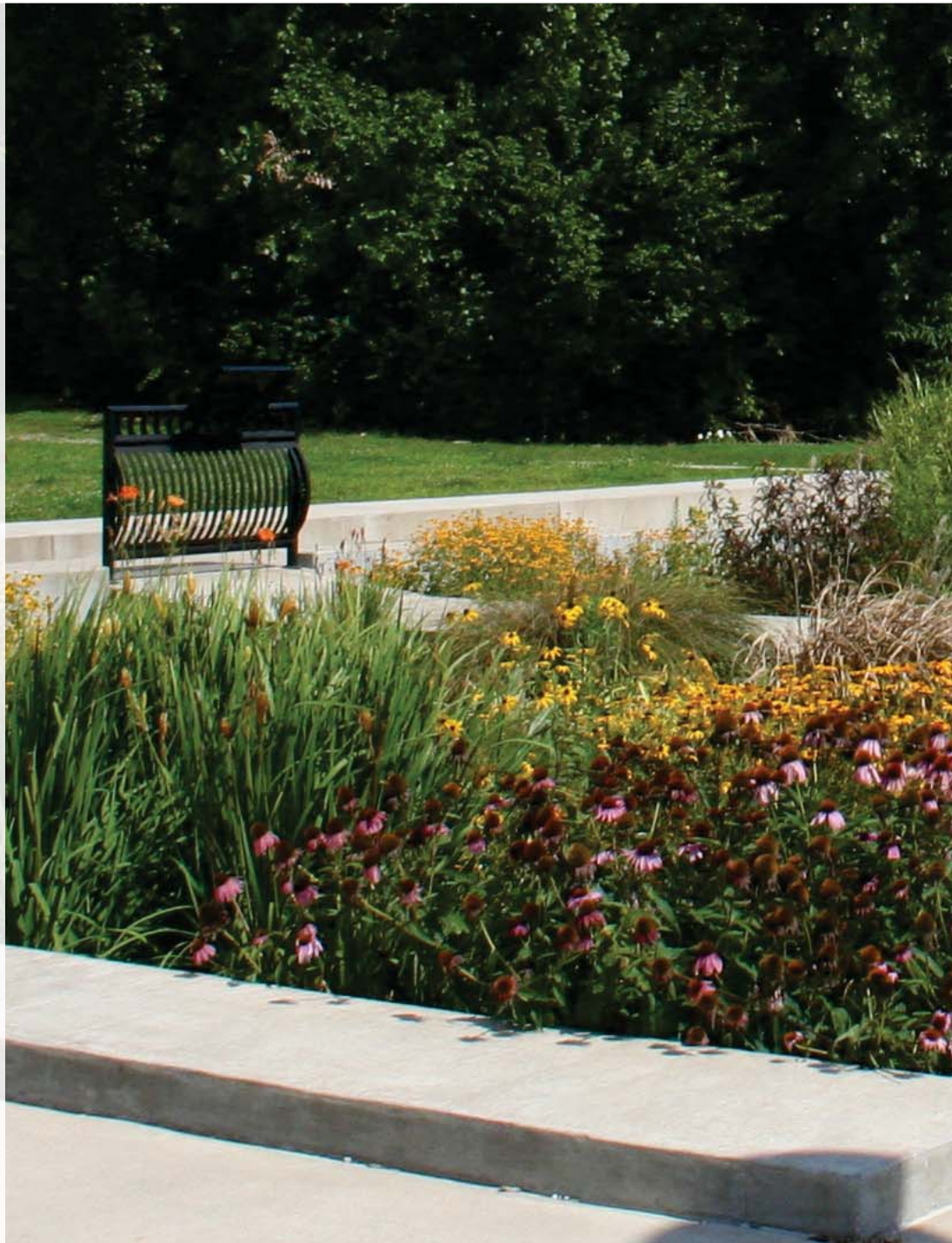
1 **Green Roof**

2 **Infiltration Practice**

Courtesy of EMH&T and the City of Evansville Water and Sewer Utility

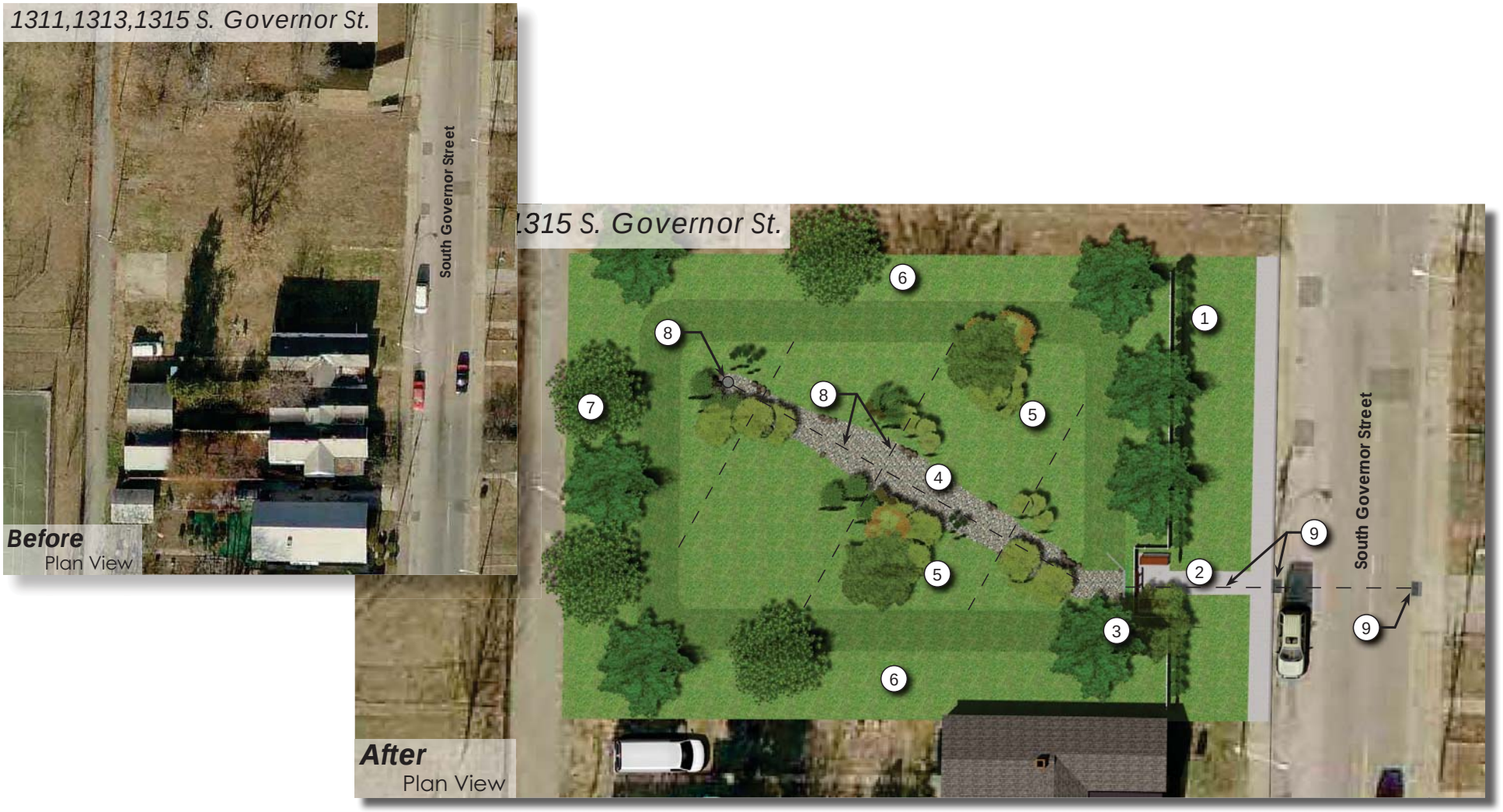
Rain Gardens, Bioswales, and Constructed Wetlands

Using naturally designed landscapes, including rain gardens, bioswales, and constructed wetlands, can be a powerful strategy for developing a green infrastructure and addressing the combined sewer overflow (CSO) Consent Decree. Designs and details from the "Green Infrastructure Concepts" Manual, prepared by the consulting firm, EMH&T, were prepared for the Evansville Water and Sewer Utility and published May 6, 2012. Some of the diagrams and illustrations are presented in the following pages. Constructing natural drainage structures within a network of pervious paving can be an effective strategy for reducing stormwater loads into combined urban sewer systems. Figure 5-6 illustrates the progression of stormwater to yard swales and ultimately yard drains that connect to precast dry wells. From the dry wells, water is absorbed into a sand and gravel layer and ultimately contributes to recharging the natural groundwater table. Figure 5-7 shows a bioretention basin with plant materials (a rain garden) and how it can be connected to a green drainage infrastructure system.



Rain gardens can be combined with linear or meandering bioswales, naturally draining large areas without the aid of extensive "gray infrastructure," concrete piping or mechanical pumps. Bioswales are designed to remove pollution, silt, and debris from surface runoff water. The bioswale's drainage course has sloping sides (usually less than six percent), and is filled with compost and native plants with fibrous root structures that help filter the stormwater. The flow path of the water is designed to maximize the time the drained water occupies the swale, which aids in trapping the silt and pollutants. When used to surround parking lots, bioswales are effective in removing a substantial amount of automotive pollution such as grease, petroleum, gasoline, or salts that collect on the paving surface. Also, inorganic/metallic compounds such as lead, chromium, cadmium and other heavy metals derived from automotive residue can be neutralized by the proper species of native grass and vegetation. When these pollutants get flushed by the rain, the bioswale acts as a natural filtration system, treating the runoff before it is released into the watershed or storm sewer.

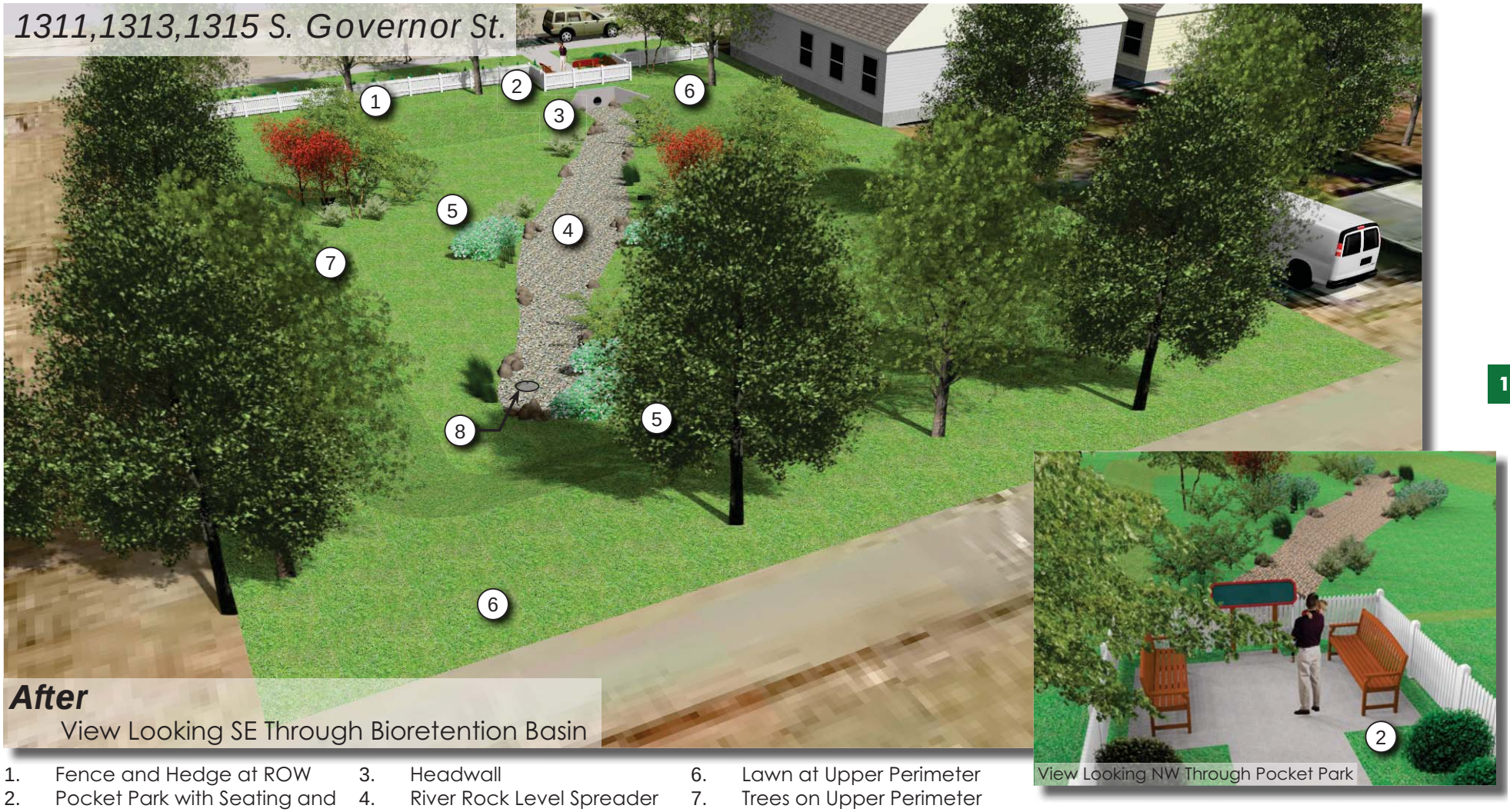
Figure 5-6: Green Infrastructure Concepts - Infiltration Facility on Vacant Lots (1)



1. Front Yard with Fence and Hedge
2. Pocket Park with Seating and Educational Signage
3. Headwall
4. River Rock Level Spreader
5. Basin Plantings
6. Lawn at Upper Perimeter
7. Trees on Upper Perimeter
8. Basin Underdrains Connect to Drywell Infiltration Structure
9. Curb Inlets and Storm Sewer Redirected to Infiltration Facility

Courtesy of EMH&T and the City of Evansville Water and Sewer Utility

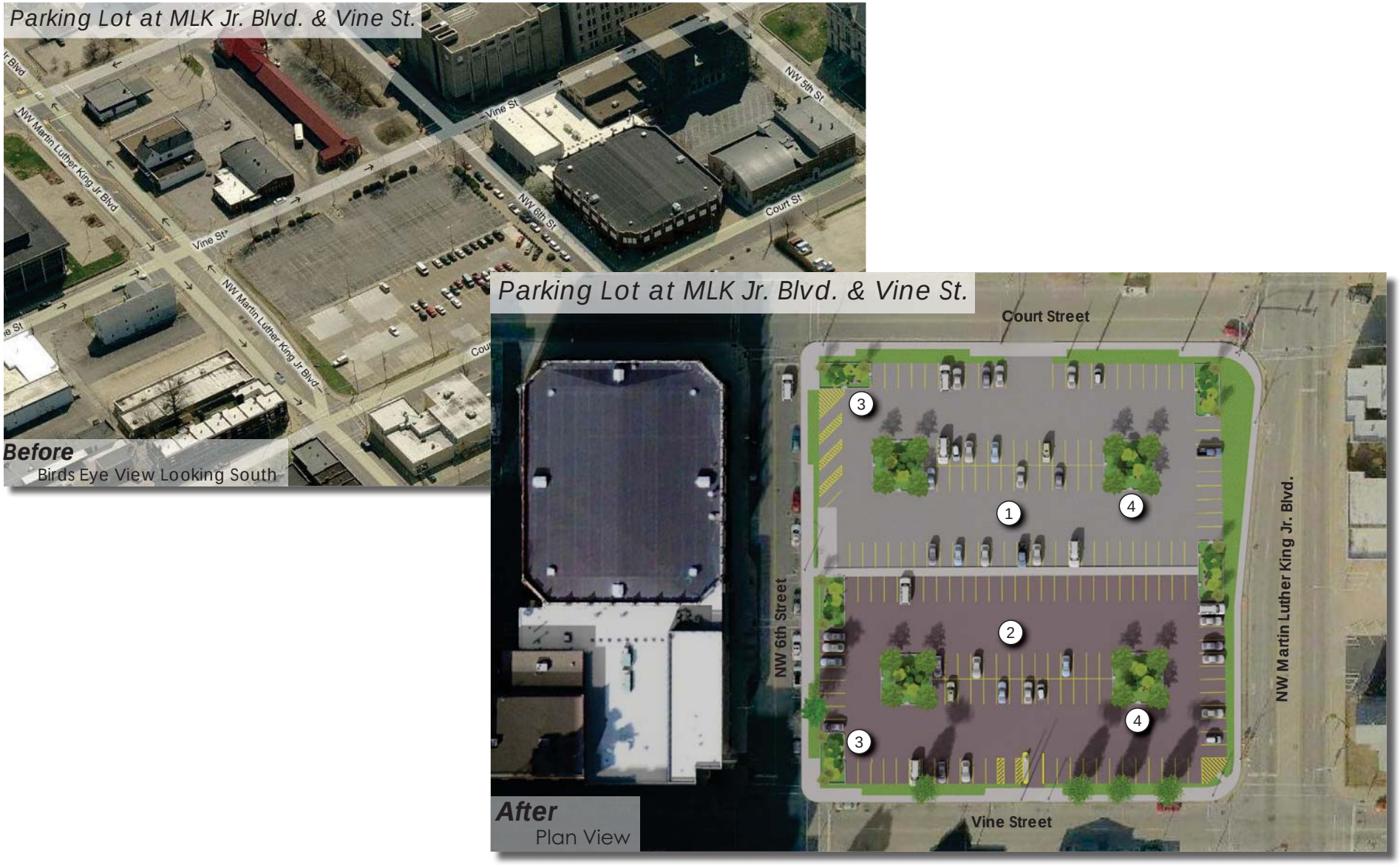
Figure 5-7: Green Infrastructure Concepts - Infiltration Facility on Vacant Lots (2)



1. Fence and Hedge at ROW
2. Pocket Park with Seating and Educational Signage
3. Headwall
4. River Rock Level Spreader
5. Basin Plantings
6. Lawn at Upper Perimeter
7. Trees on Upper Perimeter
8. Basin Underdrains Connect to Drywell

Courtesy of EMH&T and the City of Evansville Water and Sewer Utility

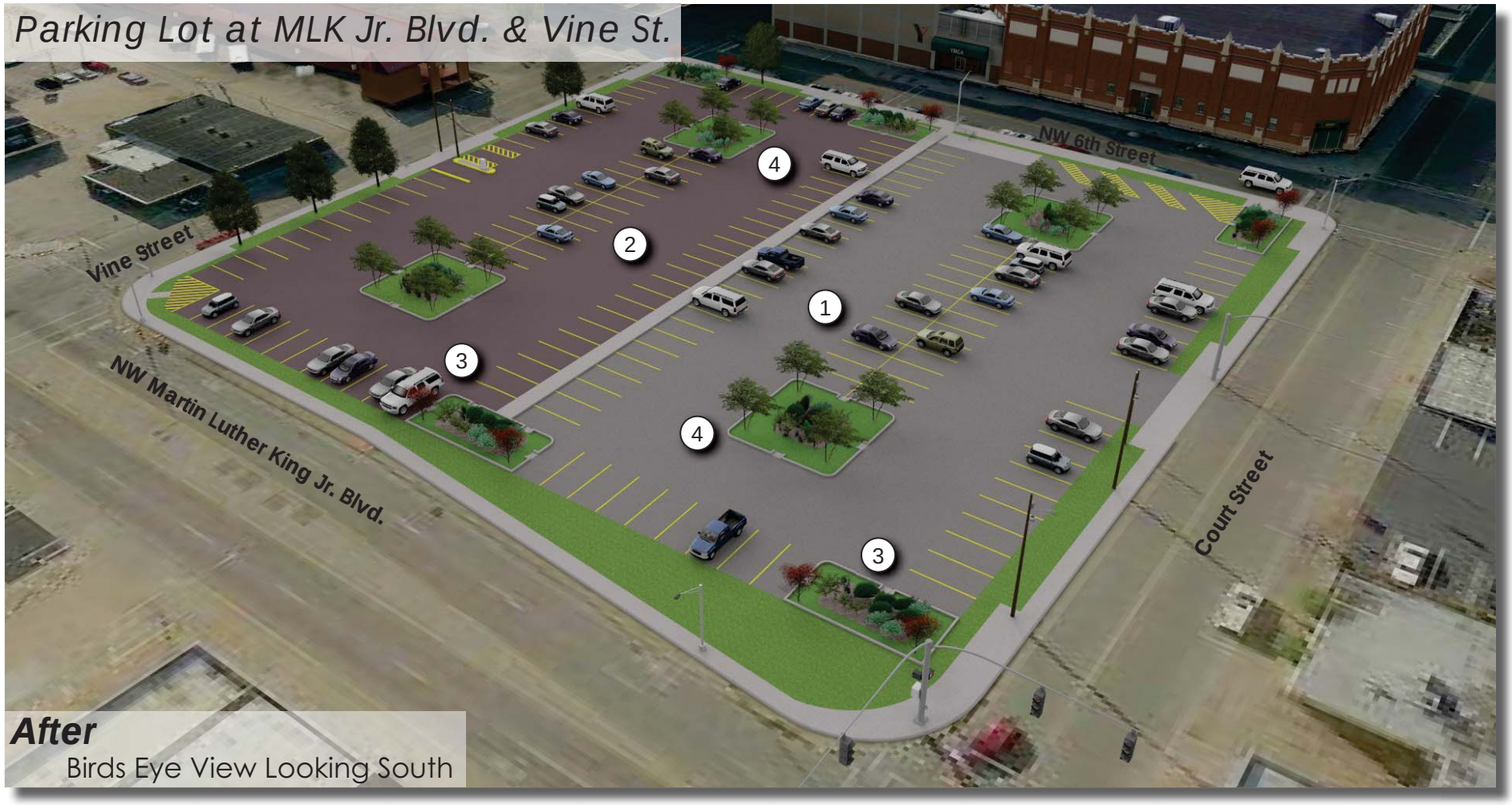
Figure 5-8: Green Infrastructure Concepts - Green Retrofit of Urban Parking Lots (1)



1. Existing Concrete Lot
2. Existing Asphalt Lot
3. Corner Bioretention with Dry Well Infiltration
4. Island Bioretention with Dry Well Infiltration

Courtesy of EMH&T and the City of Evansville Water and Sewer Utility

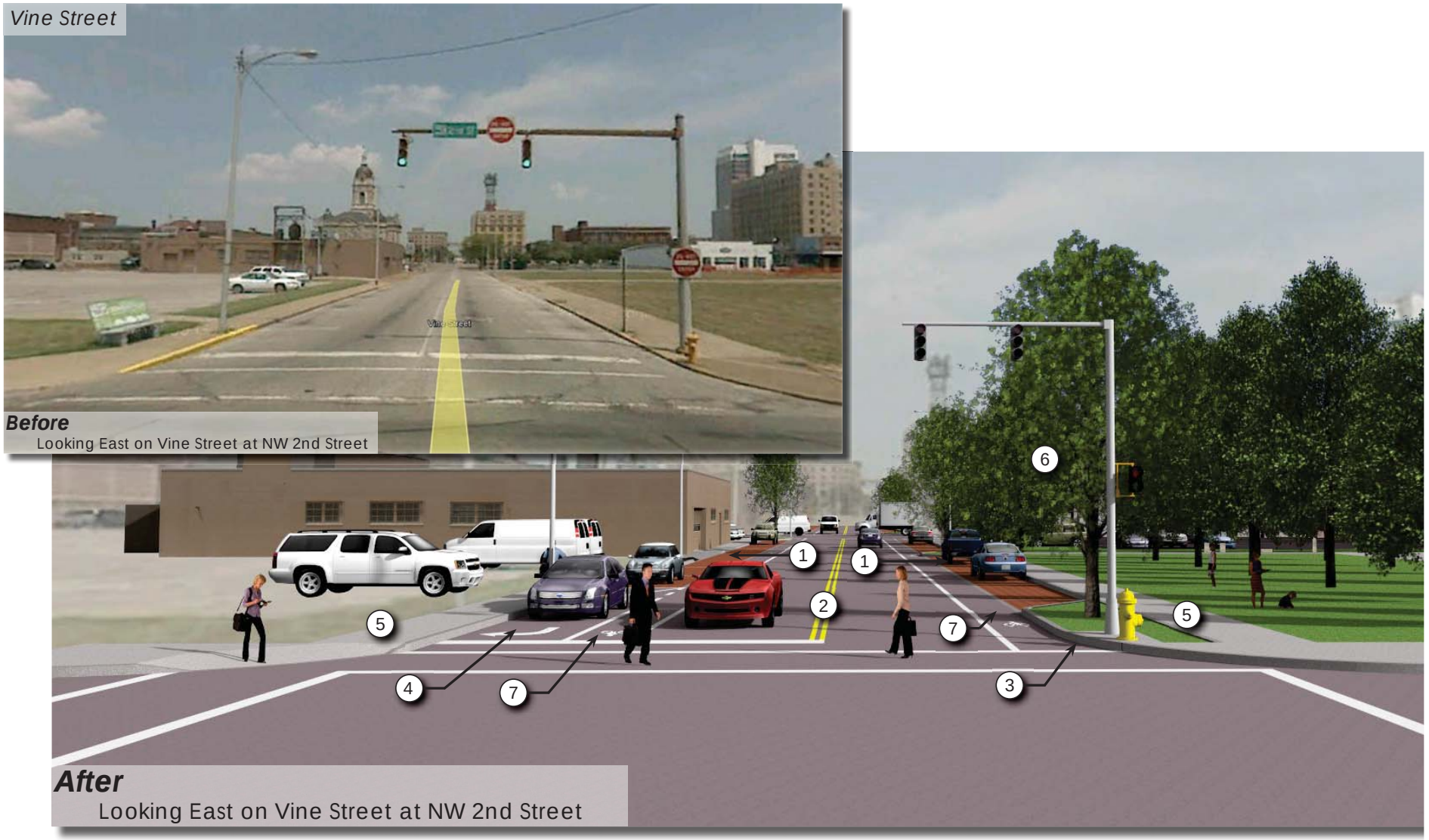
Figure 5-9: Green Infrastructure Concepts - Green Retrofit of Urban Parking Lots (2)



1. Existing Concrete Lot
2. Existing Asphalt Lot
3. Corner Bioretention with Dry Well Infiltration
4. Island Bioretention with Dry Well Infiltration

Courtesy of EMH&T and the City of Evansville Water and Sewer Utility

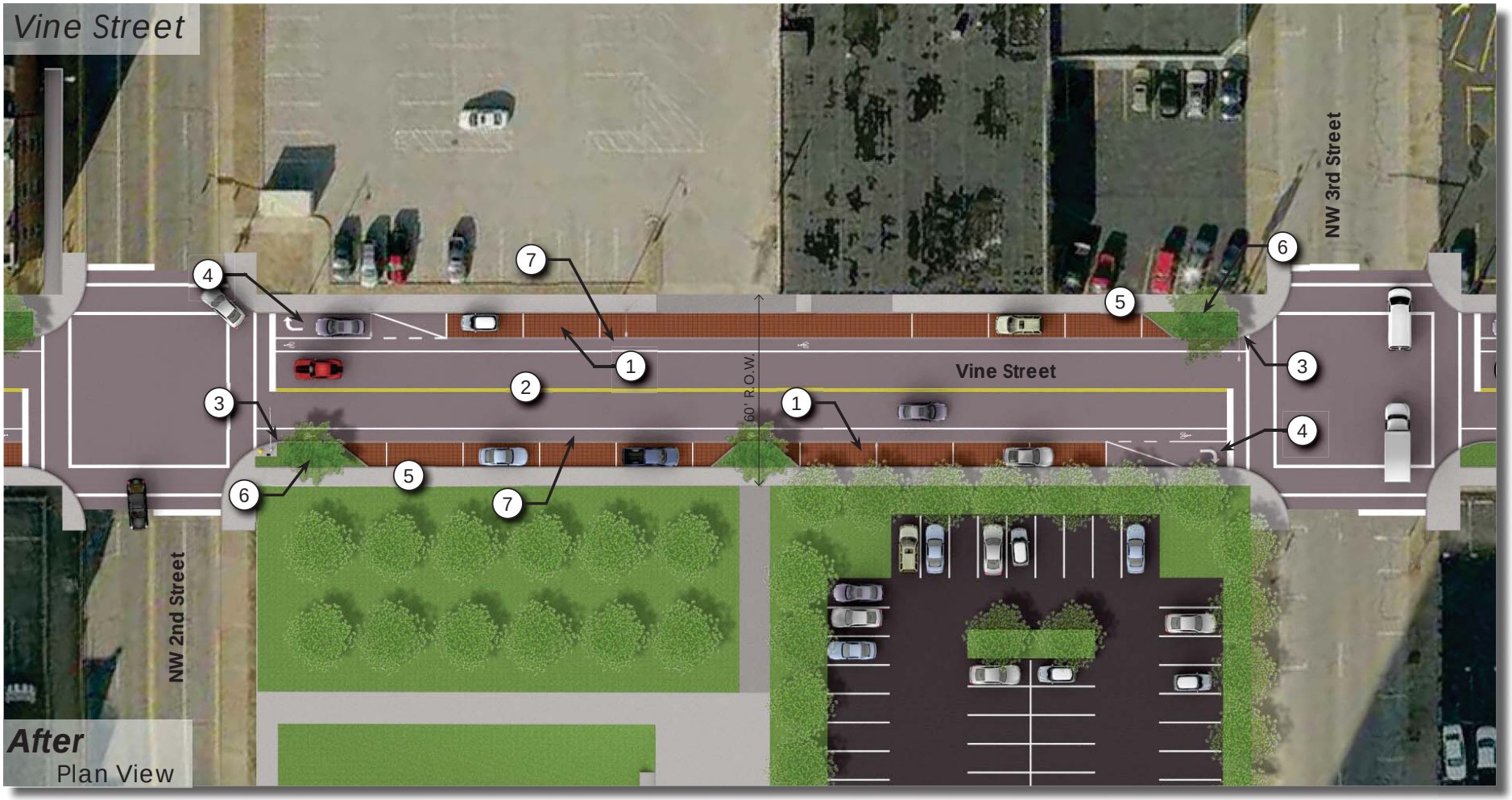
Figure 5-10: Green Infrastructure Concepts - Green Streets in the City's Urban Core (1)



1. Pervious Paver Parking Lane
2. Existing Roadways, mill and overlay
3. Curb Extension
4. Right Turn Lane
5. 6' Wide Concrete Sidewalk
6. Street Trees at Curb Extension
7. 4' Wide Bike Lane

Courtesy of EMH&T and the City of Evansville Water and Sewer Utility

Figure 5-11: Green Infrastructure Concepts - Green Streets in the City's Urban Core (2)



1. Pervious Paver Parking Lane
2. Existing Roadways, mill and overlay
3. Curb Extension
4. Right Turn Lane
5. 6' Wide Concrete Sidewalk
6. Street Trees at Curb Extension
7. 4' Wide Bike Lane

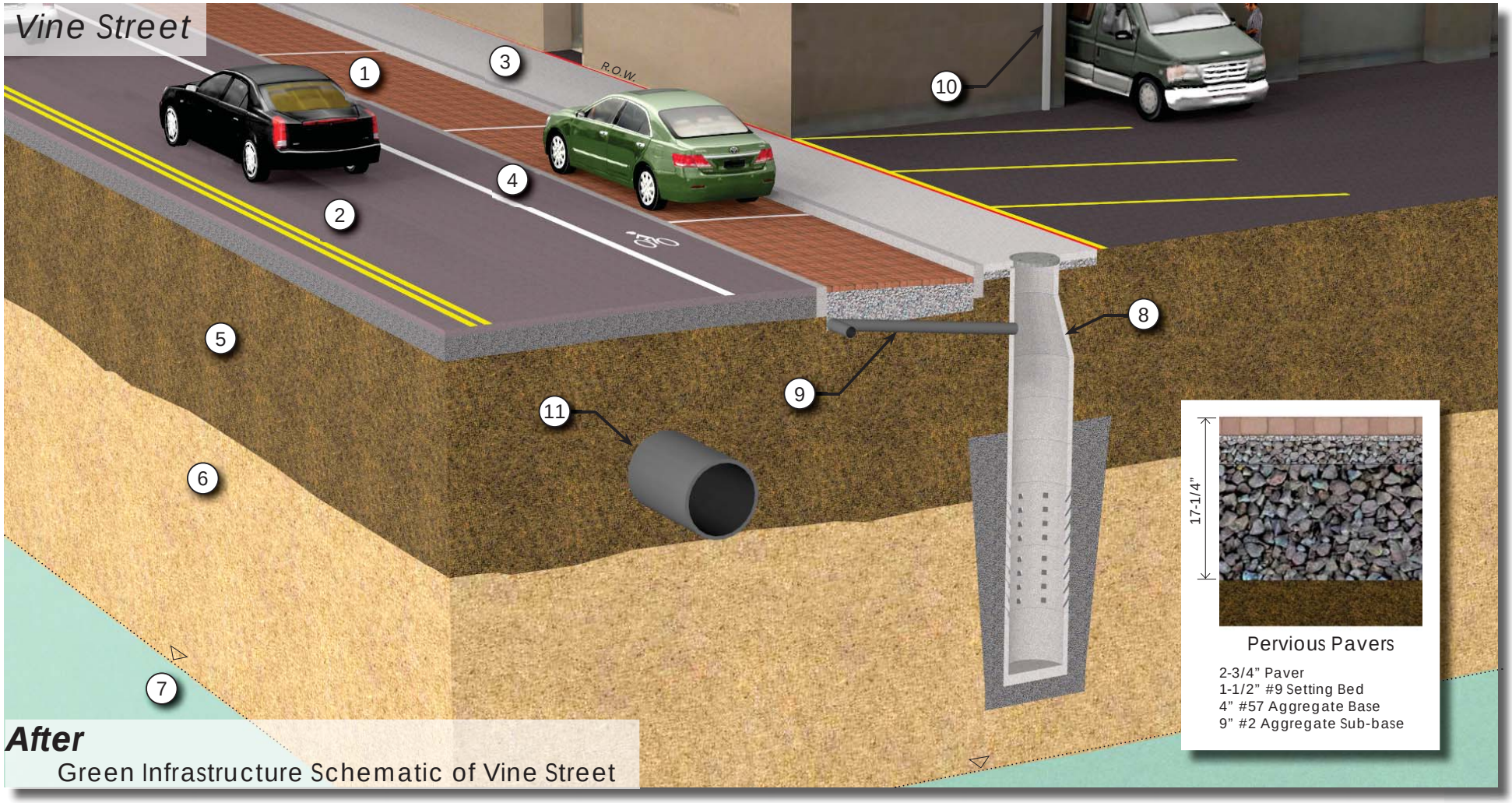
Courtesy of EMH&T and the City of Evansville Water and Sewer Utility

Green Infrastructure Schematic of Vine Street

The diagram (Figure 5-12) on the next page shows an alternative for handling stormwater in urban areas that can assist with the combined sewer overflow problem. By installing precast dry wells in the urban core, stormwater can be slowed and funneled into the natural soil and ultimately into underground water tables or aquifers. Instead of sending stormwater to sewage treatment plants, this method treats the water naturally by filtering it through a succession of permeable surfaces and underground sediment layers. The first layer to the system is a system of pervious pavers (see sidebar diagram). Once through the pervious paver layer, stormwater is diverted by drain to the precast dry well where it is allowed to filter naturally back into the earth.

It should be noted that the depth of the precast drywell structure will vary depending on the depth of any silty, clay soil layers immediately beneath the pervious paver system. The idea is to direct stormwater to a sandy, gravel-filled layer of soil, which in turn will let it flow to the natural water table. This strategy implies a familiarity with soil layers and depths and is likely to require subsoil, geotechnical investigation in order to assure the dry wells are designed deep enough to be effective.

Figure 5-12: Schematic of Typical Precast Dry Well



1. Pervious Paver Parking Lane
2. Existing Roadway, milll and overlay
3. 6' Wide Concrete Sidewalk
4. 4' Wide Bike Lane
5. Silty/Clay soil
6. Sand/Gravel Layer
7. Water Table
8. Precast Dry Well
9. Pavers Drain to Dry Well
10. Downspout to Combined Sewer
11. Combined Sewer

Courtesy of EMH&T and the City of Evansville Water and Sewer Utility

In more remote parts of the three counties, where settlement is light, sewage treatment can be handled with a constructed wetlands system, provided it is engineered properly. An environmentally sensitive constructed wetland is a good solution for the replacement of antiquated package wastewater collection systems. The constructed wetlands system has the advantage of a small carbon footprint, usually 90 percent smaller than a standard mechanical treatment plant. And because the water is treated without chemicals, the wetlands approach minimizes impacts to human health and the physical environment. Finally, a constructed wetlands system will often provide a natural habitat for insects, birds, butterflies, and other species, which makes it a natural attraction for visitors. If the wetlands area is extensive enough, educational programs can be orchestrated along pedestrian hiking trails, where visitors can learn about biodiversity and the functions of our natural and manmade wetlands.

Properly enlightened land and water management techniques can protect source water and avoid costing the community billions of dollars. By planting strips of native vegetation along streams, drainage ways, and around reservoirs, communities can provide the buffering that is so critical to natural water quality. By the use of these natural buffer zones, pollution is decreased substantially before it ever gets to the community's water systems. Along major streams, the tree and shrub roots hold the bank, preventing its erosion, sedimentation and turbidity. Natural grasses also slow the flow of runoff, allowing the sediment to settle, and giving the water more time to percolate. This slowing of water flow also helps recharge underground aquifers and natural groundwater.

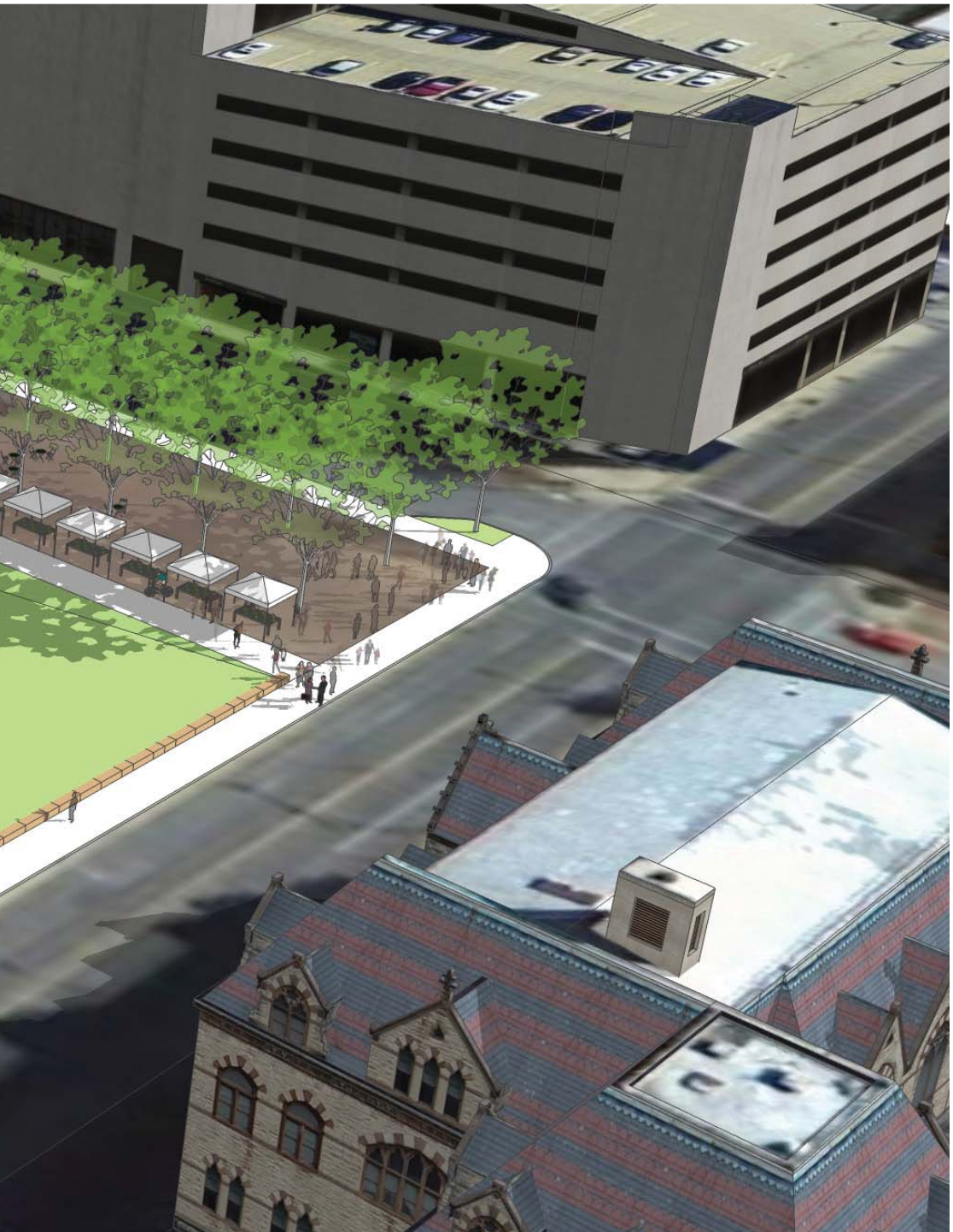
"A suburb is a place where someone cuts down all the trees to build houses, and then names the streets after the trees."

– Bill Vaughn

RECOMMENDATION: *In all future neighborhood planning efforts, both public and private, utilize green infrastructure strategies throughout, both on public rights-of-way and on private property. Strategies should include rain gardens, bioswales, pervious pavements, and natural stormwater retention systems.*

PARKS, RECREATION, AND OPEN SPACE PLAN

Proposed Bicentennial Park
Courtesy of RATIO Architects and the Department of Metropolitan Development
Evansville, Indiana



Background

The Evansville metropolitan region possesses expansive state parks and recreational green spaces such as The Evansville State Hospital grounds, Wesselman Woods State Nature Preserve, John James Audubon State Park, Eagle Slough Natural Area, Atkinson Park in Henderson, Burdette Park in western Vanderburgh County, Green River State Forest, University of Southern Indiana's campus, the Bluegrass Fish and Wildlife Preserve in Warrick County and the Howell Wetlands in Evansville, a 35 acre natural urban wetlands, owned by the City of Evansville and managed by the Wesselman Nature Society. While there are several city parks that were platted in Evansville's early history, such as Garvin, Akin and Bayard Parks, there have not been a lot of new parks or green spaces dedicated within suburban subdivisions in the Indiana counties of Vanderburgh and Warrick. Henderson County recently dedicated a large new county park near Hebbardsville in honor of a recently deceased County Judge Executive. Sandy Lee Watkins County Park consists of approximately 500 acres sold to Henderson County for one dollar by Penn-Virginia Operating Company. Henderson also announced a new urban park to be located at 16 South Water Street. This urban park will be specifically dedicated to women. The Women's Honor Court Park was organized by members of the Ohio Valley Art League, who plan to install a granite wall in the middle of the park, inscribed with honorees' names.

Prior Studies

The "Public Areas Available for Recreational Use," (Figure 5-14) from the 1927 Harland Bartholomew Plan for Evansville, shows the locations of many parks that are still serving the public today. Back in 1927, the Bartholomew planning firm did a spatial analysis of "park-shed" areas, neighborhoods that were within a half mile of parks, or within a one mile diameter shed area, shown on Figure 5-14, Figure 5-15, and Figure 5-16 from their 1927 Plan. The Bartholomew studies also hinted at the need for a circumferential greenway system.

Standards and Indicators

One of the best indicators of park availability is the percentage of the urban population living within a ten-minute walk of a public park. School sites usually offer park-like amenities, including ball fields and playgrounds. Greenways, likewise, frequently function as parks. Park acreage as a percentage of a city's total area can be calculated using data collected in an annual survey conducted by The Trust for Public Land's **Center for City Park Excellence**. In one national sampling, park acres as a percent of city area ranged between 2.1 percent and 22.5 percent, with a median of 9.3 percent. In addition, median park size can be calculated using park inventories acquired from park-owning agencies within most cities. In one national sampling, median park size ranged from 0.7 acres to 17 acres, with a median of 5.1 acres. [9] In August of 2001, Indianapolis-Marion County set a goal of 17.3 acres of parkland for every 1,000 persons in the projected area population. In locating their newer parks, they determined that there should be a park within one mile of each residential development. [10]

9 *Trust for Public Land*, parkscore.tpl.org/about.php
10 Environment/Parks/Open Space, Issue Committee Report, Indianapolis-Marion County Comprehensive Plan Update, August 2001

The **Indiana Statewide Outdoor Recreation Plan 2011 – 2015** [11] presents basic recreation, park, and open space guidelines for communities. These guidelines are based on park acreage per 1,000 people:

- **Mini-Park** – serves an area less than ¼ mile radius and has between 0.25 acres and 0.50 acres per 1,000 people.
- **Neighborhood Park** – serves an area ¼ mile to ½ mile radius and has between 1.0 acres and 2.0 acres per 1,000 people.
- **Community Park** – serves an area with a 1 to 2 mile radius and has between 5.0 acres and 8.0 acres per 1,000 people.
- **Regional/Metropolitan Park** – serves an area of one (1) hour's drive time and has between 5.0 acres and 10.0 acres per 1,000 people.

11 Indiana Department of Natural Resources, Division of Outdoor Recreation, January 2012

Figure 5-13: ECVB Softball Complex at Goebel Sports Complex - Final Concept

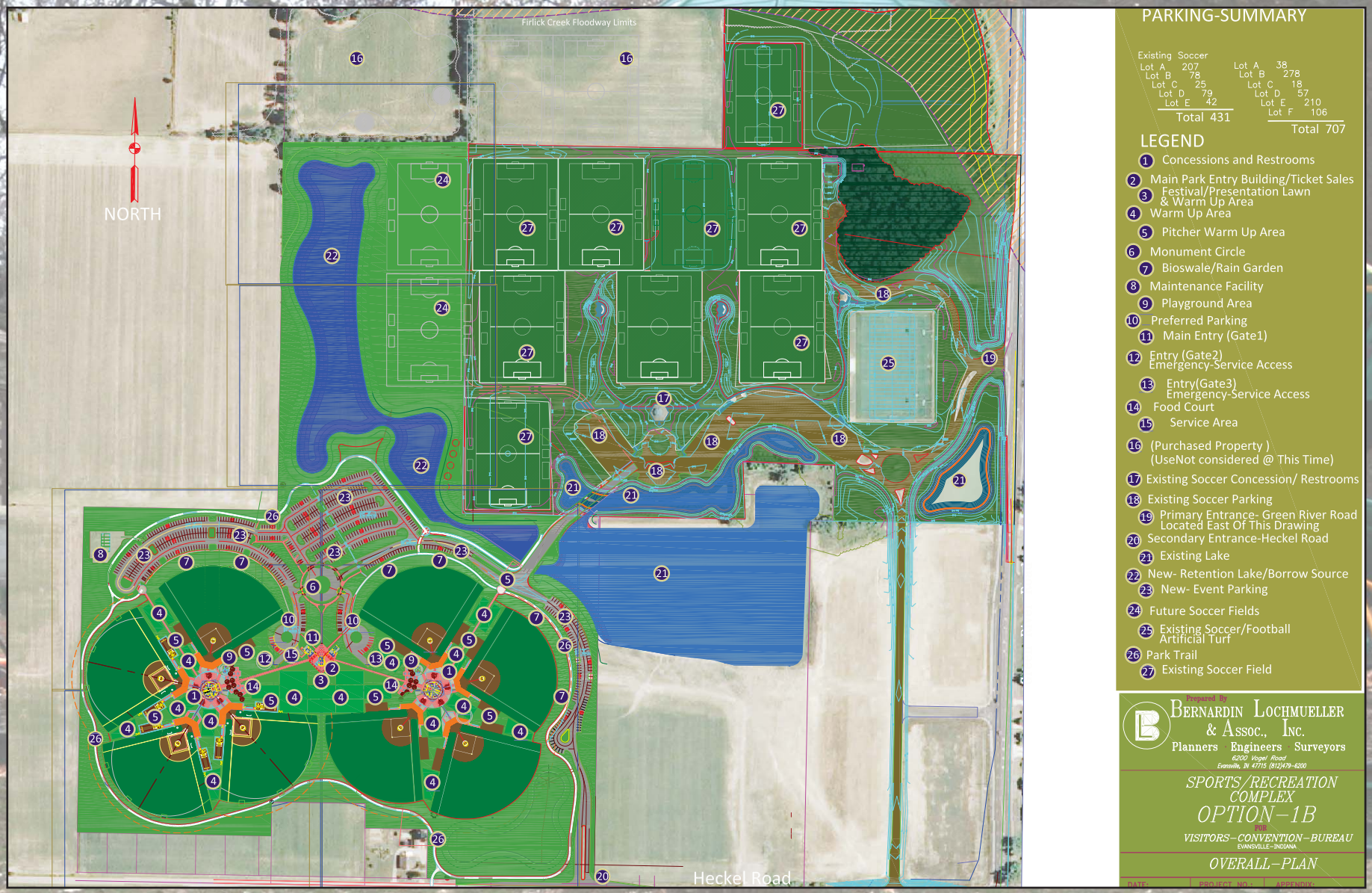


Figure 5-14: City of Evansville Public Area Available for Recreational Use 1927

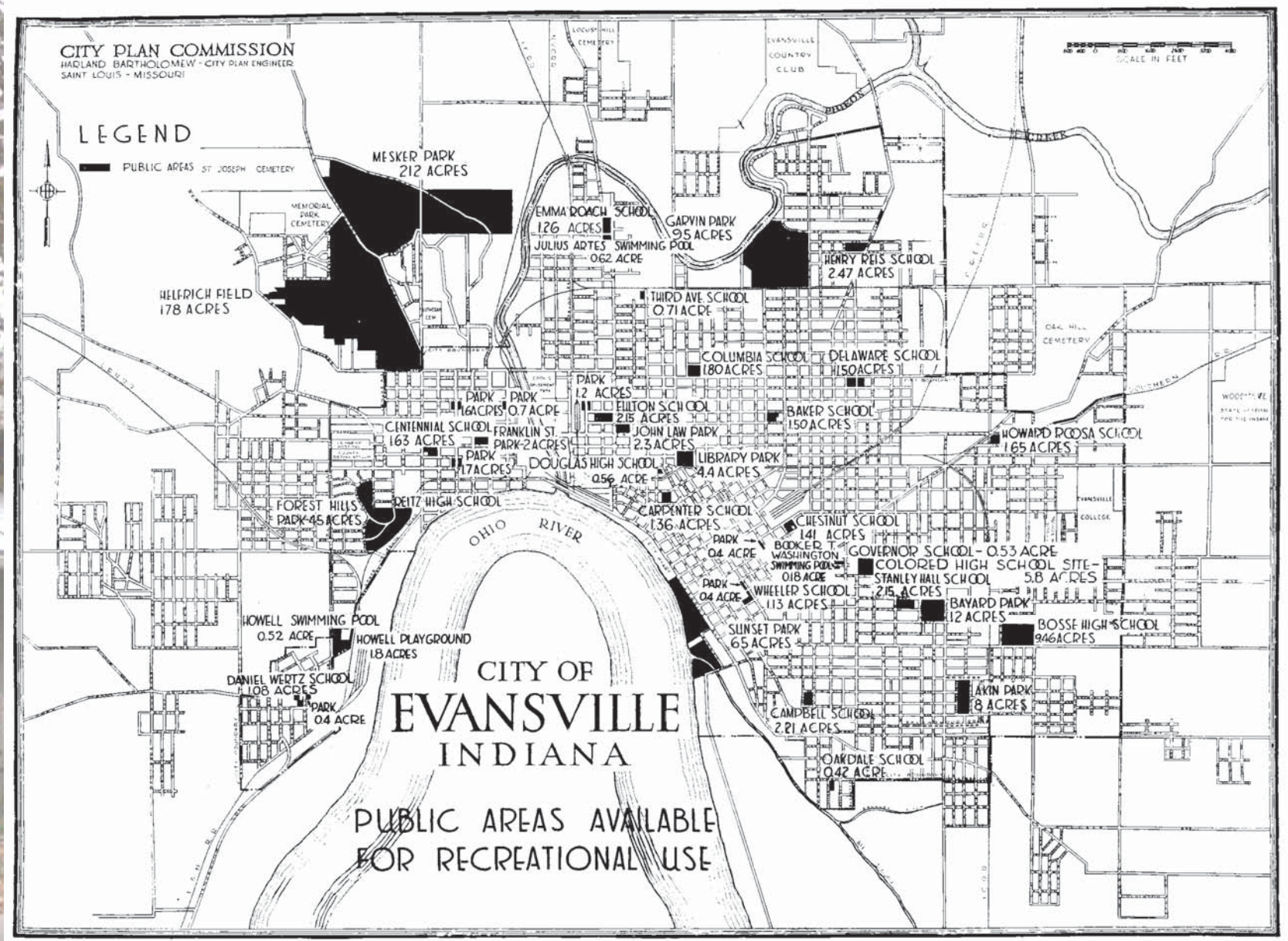


Figure 5-15: City of Evansville Study of Playground and Playfield Location 1927

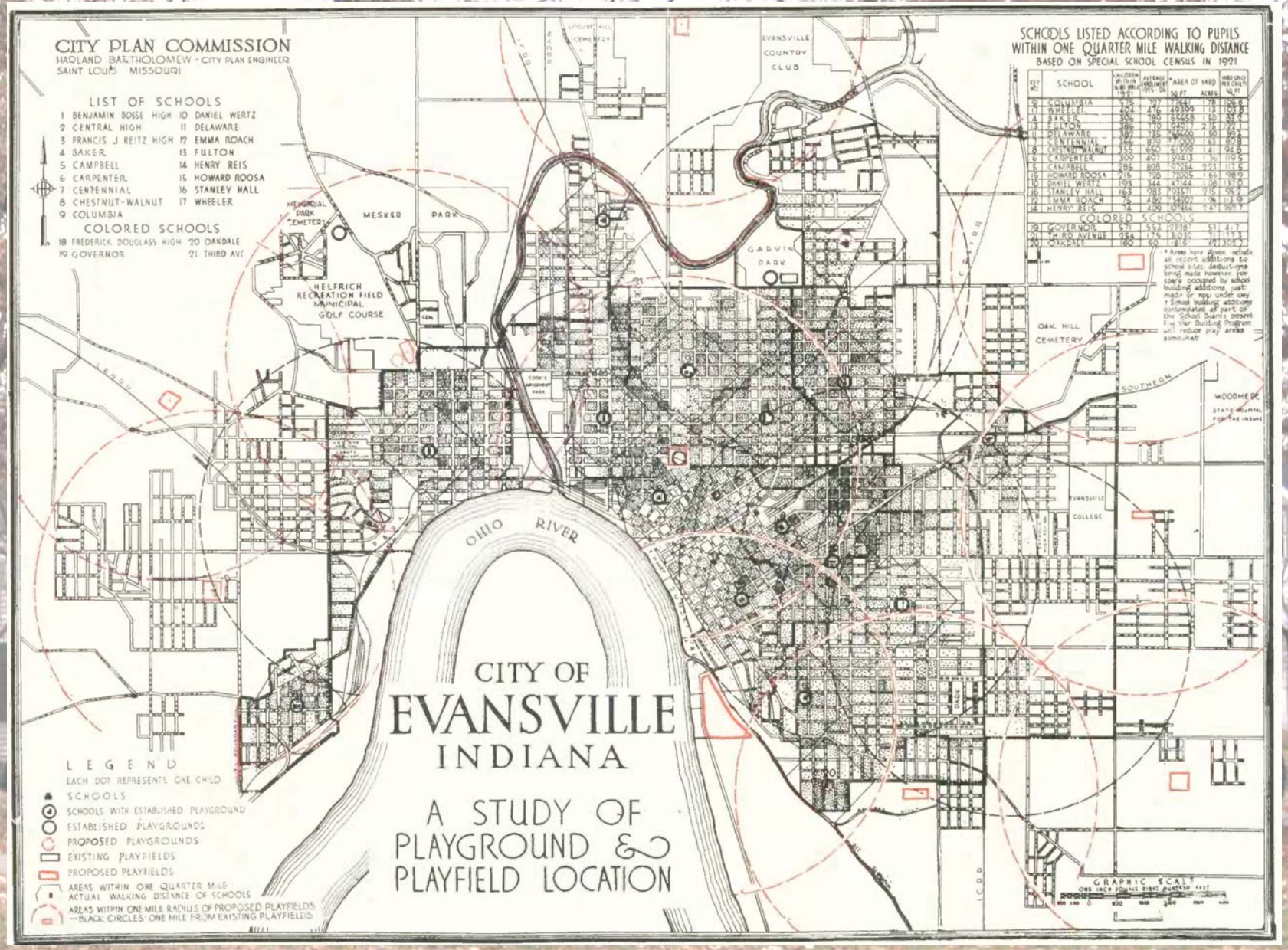


Figure 5-16: City of Evansville Existing Parks and Neighborhood Park Service 1927

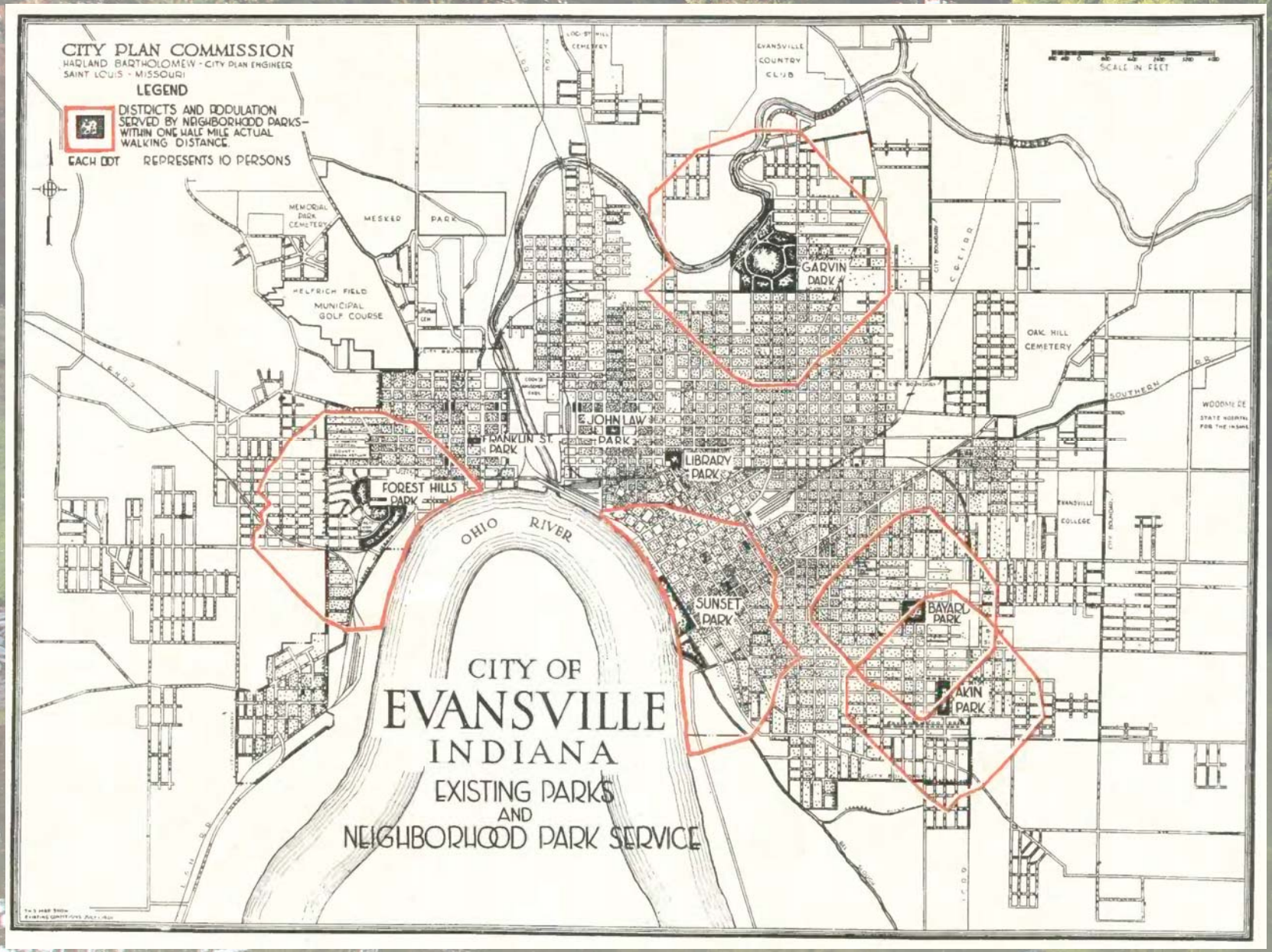
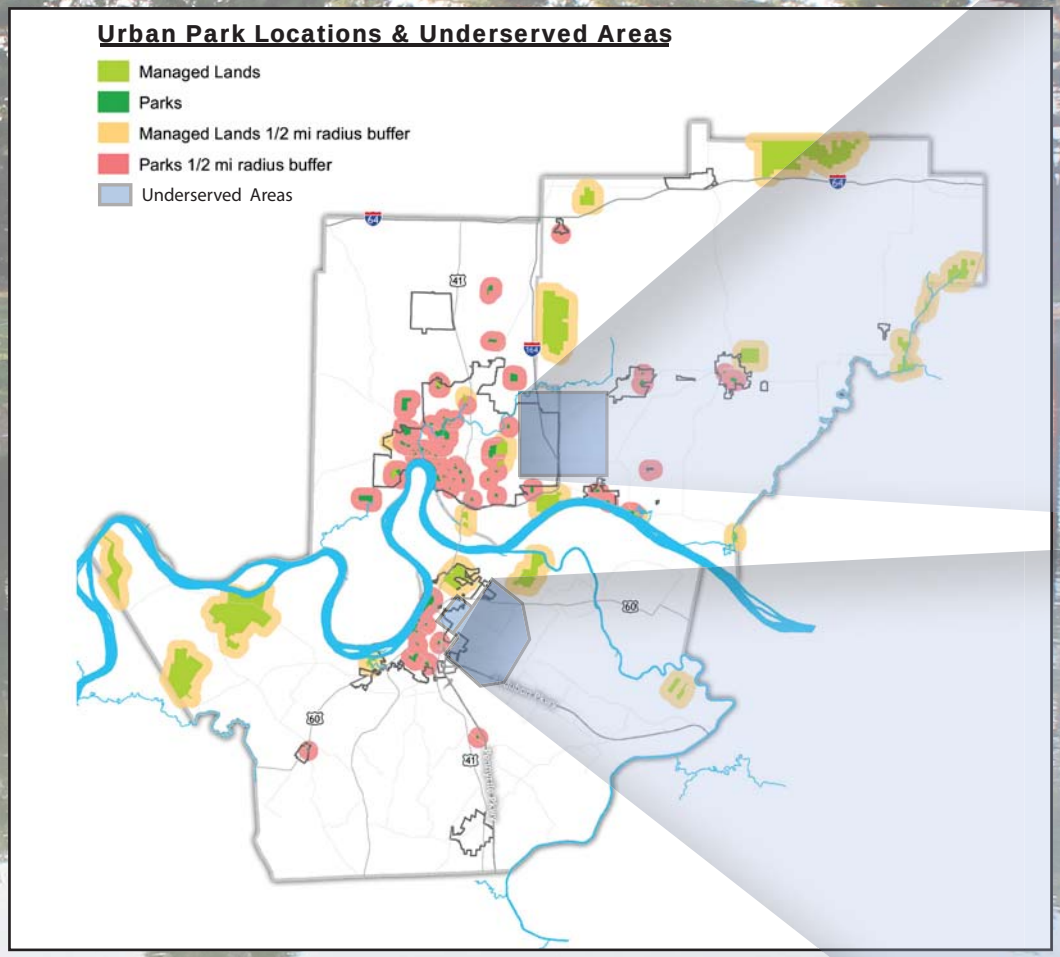
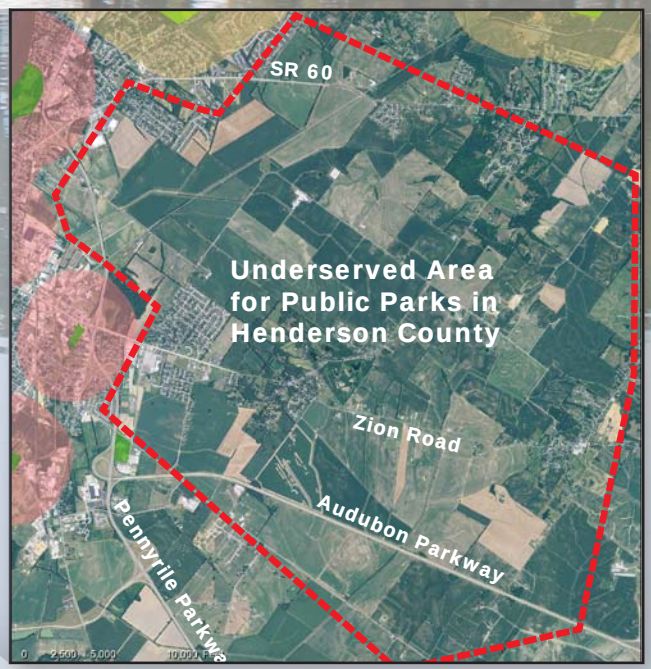


Figure 5-17: Urban Park Locations & Underserved Areas





Existing Locations

Figure 5-17 shows the existing locations of parks, open space, greenways, and large state forests and preserves. Using the basic recreation, park, and open space guidelines, Table 5-1 shows the actual park acreage and the suggested park acreage for the communities and unincorporated areas in the three county area. Table 5-2 summarizes this information. If these guidelines are followed, Henderson County and the City of Henderson have park acreage that is well within the guidelines. Warrick County and communities within Warrick County have park acreages that are close to the bottom of the range of suggested guidelines. Vanderburgh County and Evansville are well below the suggested guidelines for park acreage. (Golf courses are not included in park acreage analysis.)

Table 5-1: 3 County Parks Table

		Mini-Park			Neighborhood Park			Community Park			Regional/ Metropolitan Park			Regional Park Preserve	Special Use Park
	Acres per 1,000	0.25	to	0.5	1	to	2	5	to	8	5	to	10	N/A	N/A
	Population (2011 ACS)	Actual Acres		Suggested Acres	Actual Acres		Suggested Acres	Actual Acres		Suggested Acres	Actual Acres		Suggested Acres	Actual Acres	Actual Acres
Vanderburgh Unincoporated	61,043	-	15	31	24	61	122	59	305	488	127	305	610	584	186
Evansville	117,942	10	29	59	88	118	236	285	590	944	125	590	1,179	408	146
Vanderburgh Co.	178,985	10	45	89	112	179	358	344	895	1,432	251	895	1,790	992	332
Henderson Unincoporated	16,711	-	4	8	12	17	33	-	84	134	503	84	167	6,850	-
Henderson	28,602	1	7	14	4	29	57	135	143	229	266	143	286	316	83
Corydon	782	-	.2	.4	-	1	2	4	4	6	-	-	-	-	-
Henderson Co.	46,095	1	12	23	16	46	92	139	230	369	769	227	453	7,166	83
Warrick Unincoporated	46,011	-	12	23	-	46	92	52	230	368	406	230	460	7,878	18
Boonville	6,324	-	2	3	2	6	13	29	32	51	-	-	-	-	-
Newburgh	3,307	-	1	2	-	3	7	17	17	26	-	-	-	-	-
Chandler	2,761	-	1	1	4	3	6	23	14	22	-	-	-	-	-
Elberfeld	701	-	.2	.4	-	1	1	5	4	6	-	-	-	-	-
Warrick Co.	59,104	-	15	30	7	59	118	127	296	473	406	230	460	7,878	18

Table 5-2: 3 County Parks Table Summary

	Population (2011 ACS)	All Parks (no preservation or special use parks)				
		Actual Acres	Suggested Acres		Suggested Acres	
Vanderburgh Unincoporated	61,043	210	687	1,251	31%	17%
Evansville	117,942	507	1,327	2,418	38%	21%
Vanderburgh Co.	178,985	717	2,014	3,669	36%	20%
Henderson Unincoporated	16,711	515	188	343	274%	150%
Henderson	28,602	406	322	586	126%	69%
Corydon	782	4	5	8	80%	47%
Henderson Co.	46,095	925	515	937	180%	99%
Warrick Unincoporated	46,011	459	518	943	89%	49%
Boonville	6,324	32	40	66	80%	48%
Newburgh	3,307	17	21	35	81%	48%
Chandler	2,761	28	17	29	161%	96%
Elberfeld	701	5	4	7	122%	73%
Warrick Co.	59,104	540	599	1,081	90%	50%

Another particularly descriptive index of how communities are fixed for parks and open space is called "ParkScore." The methodology for calculating a community's score is shown on the ParkScore website, cited earlier. Cities measured for the parks index can earn a maximum ParkScore of 100. In national sampling and measuring of a ParkScore for the 50 largest cities in America, The Trust for Public Land found that populations living within a ten-minute walk of a public park range from 26 percent to 98 percent, with a median of 64 percent. Playgrounds per 10,000 residents ranged from 1 to 4.9, with a median of 2.1. To map access to public open space, ParkScore first identifies locations where parks are not readily available. These "gaps" in park service are then evaluated as to which represent the most urgent need for community parkland. The map then shows the most urgently needy locations in the color red. The map shown in Figure 5-17 is based on a similar methodology. Parks are colored in the dark green color. Light green areas represent managed lands. The amber color indicates a one half mile "park-shed" an area that is within a 5 to 10 minute walk of a managed land. The light red areas are the parkshed areas in a half mile radius surrounding the parks. Gaps in urban park service, inside the corporate limits, include space along north US Highway 41, and on the east side of Evansville. If schoolyards and school ballfields had been included as parks, the deficient areas would not be as pronounced. As mentioned previously, schools often serve as viable neighborhood park spaces.

The area just east of the common county boundary line between Vanderburgh and Warrick counties, presently not densely developed, to the east in Warrick County also lacks any plans for municipal park services. The Warrick Wellness Trail and Medical District should place a priority on parks and open space, provided in the private sector, in its future land development plans to remedy this lack of municipal park space.

Capital and Operating Costs

The relative emphasis that a community places on parkland can often be judged by the community's financial commitment to development and maintenance of its parks. The Trust for Public Land evaluated public budgets, including capital and operational spending by any agency that owned parkland within the city limits. In this national sampling, spending per resident ranged from $28 to $344, with a median of $85. The figures used in the Trust for Public Land's analysis were for FY 2008 – FY 2010. In a comparable analysis using 2009 county population estimates from the US Census Bureau in a cross-section of cities, the following per capita funding has been noted:

Table 5-3: Parks Funding Per Capita

City	Population	Total Park Expenditure	$ Per Capita
Washington D.C.	591,833	$154,324,830	$260.76
New York City	8,863,710	$1,313,767,386	$148.22
Chicago	2,853,114	$354,558,960	$124.27
Boston	620,535	$69,620,456	$112.19
Evansville, IN	117,429	$11,952,677	$101.79
Henderson, KY	28,602	$1,220,820	$42.68

The data indicates that the City of Evansville and the City of Henderson are in the bottom half to bottom one-third of cities for park expenditures, as compared with the national sampling. The Evansville figure does not include school, cemetery, or road maintenance work, such as median plantings in public rights-of-way, or schoolyard ball fields. Golf courses are also not included in this analysis.

According to the Trust for Public Land, most cities spend between $50 and $150 per resident for parks, which is often not enough. Complaints about park maintenance, along with potential park expansions, landscape plantings, park aesthetics, and other related issues can likely be addressed if the City of Evansville's Parks and Recreation budget, combined with partnerships between other incorporated cities and other city departments, not-for-profits and private interests allocate a total of $150 to $200 per resident for parks. Additional public funding could be used to acquire more park land to serve existing neighborhoods that are not near a public park. The acquisition program could be a joint effort between the city, the county, and private landowners and developers, who could aid the effort with some strategic donations of easements, "left-over," and undeveloped properties. A joint public-private effort to keep streets landscaped, medians attractive, parks safe and clean, and streetscapes lush and beautiful would do wonders for city image and overall economic development.

While park acreage for the City of Henderson falls within the suggested park guidelines, the park expenditures per resident are below most communities. Similar to Evansville, Henderson may want to consider joint public-private efforts to maintain the quality of its park system.

While information was not readily available for communities in Warrick County, the efforts on the Warrick Wellness Trail, the Newburgh Community Park, the Newburgh Lock and Dam park, the Scales Lake expansion, and Boonville downtown park suggest that these communities recognize the importance of park and recreational areas.

Developing new parks is not the only effective strategy for providing open space to community residents. Also effective in exposing more citizens to green space, is the strategy of expanding existing green space, where possible, and/or connecting green open spaces with lushly landscaped trails or naturally occurring drainage channels that are bestowed with native vegetation.

Infill Parks on Vacant Lots

Two new mini-parks are being developed in the Jacobsville neighborhood. Their locations are shown on the Jacobsville neighborhood map. These parks are being developed by Deaconess Hospital, on the Garfield Avenue site; and through a collaboration of Jacobsville Join In, along with One Life Church, on the other site shown. The strategy of identifying vacant lots to put to neighborhood use for community gardens or public playground and park space, is a key infill strategy that can be used in both suburban, as well as urbanized neighborhoods.

RECOMMENDATION: *County and city governments in Vanderburgh, Warrick, and Henderson should develop strategies ensuring that parks and recreation facilities are funded at a level that is in line with national averages, in the range of $150 to $200 per capita annually.*

Figure 5-18: Jacobsville Proposed Parks Map

Figure 5-19: Roberts Park and Overpass Plan

Roberts Park and Overpass Connection

An important plan for completing a major urban park on the near eastside of Evansville is the Roberts Park and Overpass Plan (Figure 5-19). This important project has been designed to connect the Wesselman Park area with the State Hospital property. The resulting connected urban open space is unique in its offerings. It houses youth and amateur sports, as well as picnicking, biking, walking, and exercising. Few urban communities have this much acreage committed to parks and open space for their citizens. An important sustainability component of the Roberts Park Plan is an engineered wetlands to retain stormwater and provide an educational experience for visitors.

RECOMMENDATION: *The City of Evansville should fund the Roberts Park project since it is a key urban open space and family recreation center. The City should also commit ongoing annual maintenance funding for the entire area, including the portions of the State Hospital grounds that the City of Evansville now owns.*

"When is the best time to plant a tree? Twenty years ago. The second best time? Today."

– Chinese Proverb

Urban street trees are the best, most economical solution to the "urban heat island" effect that plagues downtowns having large expanses of paved parking, street rights-of-way, and dark-colored roofs. Measurements of ambient temperatures taken on barren versus tree-lined and canopied street rights-of-way in the U.S. document differences in temperature that range from five to fifteen degrees F between them. [12] According to the US Department of Agriculture, the cooling effects of a single mature and healthy tree "is equivalent to ten room-size air conditioners operating 24 hours a day." [13] And aside from the cooling effects, trees also act as major carbon sinks, absorbing vast amounts of CO2. Street trees lining major arterials and collectors, in proximity to the roadway, are ten times more effective than more distant vegetation at absorbing auto exhaust before it enters higher altitudes in the atmosphere. [14]

In the Ohio River Valley, we get heat waves and stagnant, oppressive air in the summertime, making urban areas, with endless black rubber roofs and acres of paved parking, nearly unbearable. When temperatures are in the high 80s or above, downtown areas without tree cover seethe with heat waves, and we often exacerbate the situation by cranking up the air conditioners, which adds heat transfer as a by-product. Urban heat islands without trees raise ambient urban temperatures enough to account for most of the "warming" taking place in urban areas. According to the EPA website, the "shade-evapotranspiration" that trees provide, emitting water vapor into the atmosphere, and reflecting the sun's rays, can reduce peak summer temperatures by 2 to 9 degrees.

Brian Stone, director of Georgia Tech's Urban Climate Lab, says that a thriving tree canopy (around 30 percent coverage in the downtown) can be more beneficial than any other environmentally proactive measure we have to combat rising temperatures. [15] Brian Stone advocates that cities like Louisville, Kentucky and Evansville, Indiana should have a **Heat Management Plan**, which involves making an inventory of the current tree stock in the city. Louisville, through its Metropolitan Sewer District, added an urban reforestation program in 2009, with the goal of planting **one thousand trees a year for fourteen years**. The trees are planted through partnerships, grants and other incentives. [16]

Street trees can also have a major positive impact on storm water flow and treatment. The City of Evansville faces major costs to correct pollution caused by combined sewer overflows (CSOs), as mentioned previously in this chapter. The antiquated collection systems in the older parts of the city combine storm water with sanitary sewage. In a hard rain, the commingled waste surges into local waterways. The EPA estimates such overflows will surpass more than 1.2 trillion gallons annually in the US. [17] However, when rainwater falls on trees, the first 30 percent of the precipitation is usually absorbed directly by its leaves. Once the leaves get saturated, 30 percent more of the rain seeps directly into the soil which, near trees, is made more porous by the tree's root structure. The root structure itself absorbs

12 "Urban Street Trees: 22 Benefits," by Dan Burden, Senior Urban Designer, Glatting Jackson, Walkable Communities, Inc. 2006
13 US Department of Agriculture, Forest Service Pamphlet #FS-363
14 *Trees in Urban Design*, Second Edition, by Henry F. Arnold, published by Van Nostrand Reinhold Company, 1980, page 149

15 "Feeling the Burn" by Mary Chellis Austin in Louisville Magazine, August 2013
16 "Feeling the Burn" by Mary Chellis Austin in Louisville Magazine, August 2013, page 46
17 "The Sickening Sewer Crisis," by David Whitman, US News and World Reports, June 12, 2000

water back up into the tree, and then transpires it into the air. As a result, communities that add 25 percent tree cover will reduce their storm water loads by up to 10 percent. In many American cities, this 10 percent is enough to eliminate the CSO problem altogether. [18]

The City of Henderson, Kentucky has been honored with the Sterling Tree City USA award since 2009, by the Arbor Day Foundation. This award is given to cities who earn ten consecutive "Growth Awards" from that organization. Henderson is a pioneer in the region for active tree management. Vanderburgh County presently possesses 32 of Indiana's State Champion Trees and a number of them are within the city limits of Evansville. Evansville has been proactive in managing its tree planting plans and programs, as evidenced by its designation as a Tree City each year since 2001. The Tree City USA® program, sponsored by the Arbor Day Foundation in cooperation with the USDA Forest Service and the National Association of State Foresters, establishes standards that must be met by cities applying for Growth Award/Tree City USA standing. Designated a Tree City since 2001, Evansville also received a Tree City USA Growth award in 2009 – which was its sixth consecutive year – in recognition of the city's efforts to continually strengthen its local tree care program. Evansville will shortly join Henderson, becoming eligible for its own Sterling Tree City USA designation.

In discussing the aesthetic, urban design and planning issues related to street tree selection, a quote from Jeff Speck, co-author of The Smart Growth Manual, in his new book, *Walkable City*, pages 230-231, effectively describes concerns that most landscape architects and urban designers have when discussing the topic. To quote Mr. Speck:

> *"My…suggestion is to abolish the current practice of refusing to plant more than a few of the same tree in a row. Too many American cities are held hostage by urban foresters who, fearing the next Dutch elm disease, require that every street be planted with a tutti-frutti species mélange, so that no single blight can denude a whole street. While based on sound logic, this proscription typically prevents cities from doing what they once did, which was to create streets of distinct character based upon their consistent use of a single tree species. Many of us grew up in towns with an Elm Street, a Maple Street, a Beech Street, and a Walnut Street. In contrast to the current tradition of streets named after the developer's daughters, these streets were actually planted according to their name, and each had its own unique landscape.*
>
> *The tutti-frutti rule makes most of America's best streets illegal. As many observers have commented, a street with consistent, mature trees is like a cathedral, with the trunks serving as columns and the branches forming the vaults. This happy outcome is only truly possible when a single species of tree is planted at a consistent spacing distance.*
>
> *Moreover, when the next blight comes, better that it wipe out one street out of ten than one-tenth of every street, because, in most cities, nobody gets a phone call unless the die-off is pronounced and localized. A mandate for replanting often only arises when a street is impacted dramatically. When this happens, that street can be reforested with trees that will once again reach skyward in unison."* [19]

Mr. Speck goes on to observe that a compromise position would be that in the hands of a truly skilled forester, streets might be planted with two or three different species that appear almost identical, yet have a different genetic makeup and a different tolerance or intolerance for disease.

18 "Identified Benefits of Community Trees and Forests," by Dr. Kim D. Coder, University of Georgia, 1995

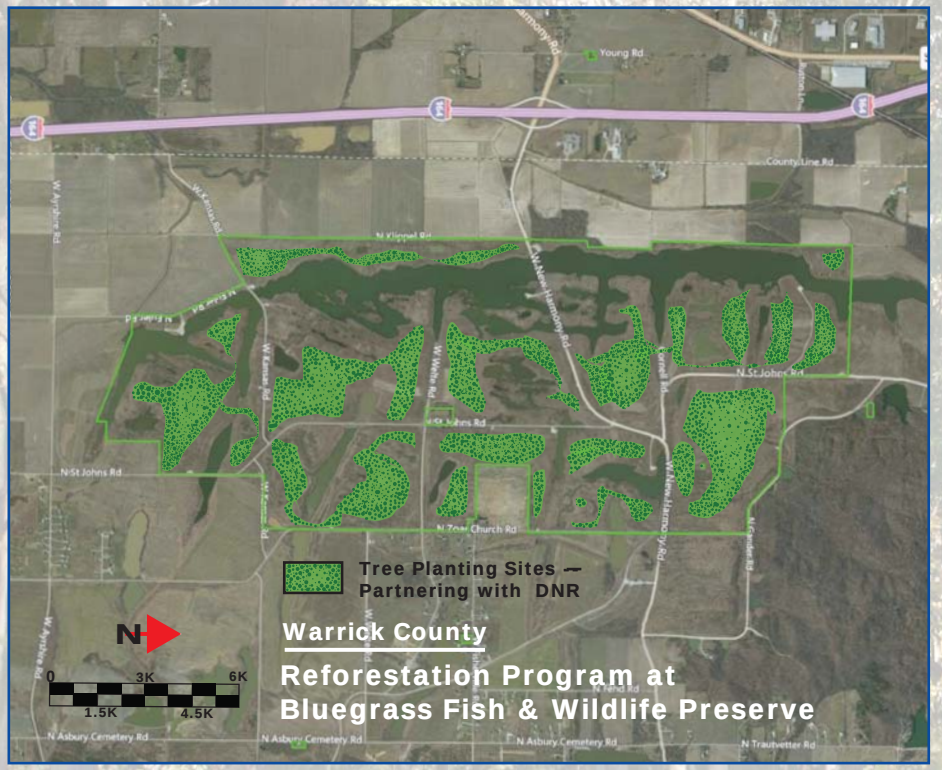
19 *Walkable City* by Jeff Speck; Farrar, Straus and Giroux; 18 W. 18th St., New York, NY, 2012

The tri-county area was once known as the furniture capital of the world, its landscape rich in mature hardwoods. Agriculture and land development have removed much of this vast interconnected hardwood forest. But as mentioned, planting trees may be one of the best antidotes to atmospheric excess of carbon (CO2). Replenishing our downtowns with street trees and replanting some of our meadows and grasslands with tree cover helps to restore the "lungs of the region."

One area that stands out is the Bluegrass Fish and Wildlife Preserve in Warrick County. This restored strip-mined acreage is ideal for a major reforestation program, working closely with the Indiana Department of Natural Resources. Other key locations include area river banks, the banks of lakes, and stream banks known as riparian areas. Restoring native vegetation helps clean up toxic waste and restores diversity.

Trees like the black willow and the red dogwood help all life forms in the watershed's ecosystem. Black willow is the first tree to produce pollen in springtime, bringing back bees to their nest to feed their young. The pollen has antibiotics and nutrients that strengthen the young bees. The willows also release salicylic acid, and related compounds, which help fish fight infection. Red dogwood berries are a very important food source for a wide range of birds, including woodpeckers and many songbirds. [20]

Figure 5-20: Warrick County Reforestation Program



20 *The Man Who Planted Trees* by Jim Robbins, Spiegel & Grau, New York, 2012

Jim Robbins, in his book *The Man Who Planted Trees* (see footnote 20), summarizes the importance of sustainable urban forests:

"...we must create sustainable urban forests. Precisely how best to do this requires study and analysis of both forests and managed lands. ... In general it means planting forests along streams and rivers, and along the ocean in coastal cities. Forests and trees should be planted in and around places where people live and should create corridors to connect to large preserves on the edges of town. The construction of strategically located poplar and willow forests - on rooftops, in and around parking lots, near farm fields - can treat agricultural and urban runoff before it makes its way into the oceans as well as provide sewage treatment and biomass for fuel.

The unplanned chaos of the urban and suburban environment, and the fact that most of it is private property, makes it difficult to do large-scale restoration, but education, innovation, and incentives could convince people to roll back the Kentucky bluegrass and turn their lawns and schoolyards into something wild. We can use an alternative approach to agriculture called **agroforestry** *that marries forestry and agriculture, to the benefit of both. Trees around or over a farm field can reduce soil erosion and dust and keep the fields cool and more moist.*

A sustainable urban forest certainly should mean an end to the planting of exotics, or at least some types of exotics. While a Bradford Pear or a Tree of Heaven might produce the most beautiful flowers or best autumn colors, these…[species]... are built for a few years of show, not for survival over the long haul, and may not do well as climate changes. Douglas Tallamy, a professor of entomology and wildlife ecology, who studies ecosystems in the eastern United States, says these exotics are hastening the collapse of the biodiversity around us. The majority of insects in this country can't eat from the trees most Americans plant. The bugs here evolved to live on oak and hickory and hemlock, and as the trees have disappeared, the insects that eat them have also disappeared. And trees are by far the single biggest generators of biodiversity. … The top twenty generators of moths and butterflies … [are] trees – oak, cherry, willow, and birch."

RECOMMENDATION: *Incorporated cities in the three county area, including Vanderburgh, Warrick and Henderson counties, should set goals for planting trees in the most barren places within their downtowns. These incorporated downtowns should plan to increase the overall tree canopy within the city limits to 30 percent coverage. In Warrick County, in treeless strip-mined reclamation areas, plant trees for an average density of 300 trees per acre. Warrick County should set a target of 3,600 acres of newly forested lands. Finally, a worthy goal for the region, not counting reforestation of strip-mined reclamation lands, would be the planting of one thousand trees a year for the next 25 years, similar to the targets set by Louisville, Kentucky.*

Figure 5-21: Downtown Evansville Tree Cover Target Plan

Figure 5-22: Downtown Henderson Tree Cover Target Plan

A valuable tool for gauging and quantifying the benefits of urban forests is I-Tree (www.itreetools.org). I-Tree can be utilized by communities of various sizes, large or small, to locate and inventory forest resources and convert the physical information into the dollar values of benefits provided to home communities. Examples include pollution removal, carbon storage and sequestration, and structural (tree replacement) value.

Greening the Lloyd Expressway

The Lloyd Expressway (Highway 62) connects Evansville with Posey County to the west and Warrick County to the east. Key land uses branch off of the Lloyd Expressway including Evansville's downtown, both the University of Southern Indiana and the University of Evansville, and major shopping areas on both the west and east side of Evansville.

RECOMMENDATION: *The Lloyd Expressway, the major east-west artery through Evansville, should be developed using natural drainage-ways, and native plantings to form a linear park from USI to Evansville's west side commercial district.*

Figure 5-23: Linear Park USI to Red Bank Road

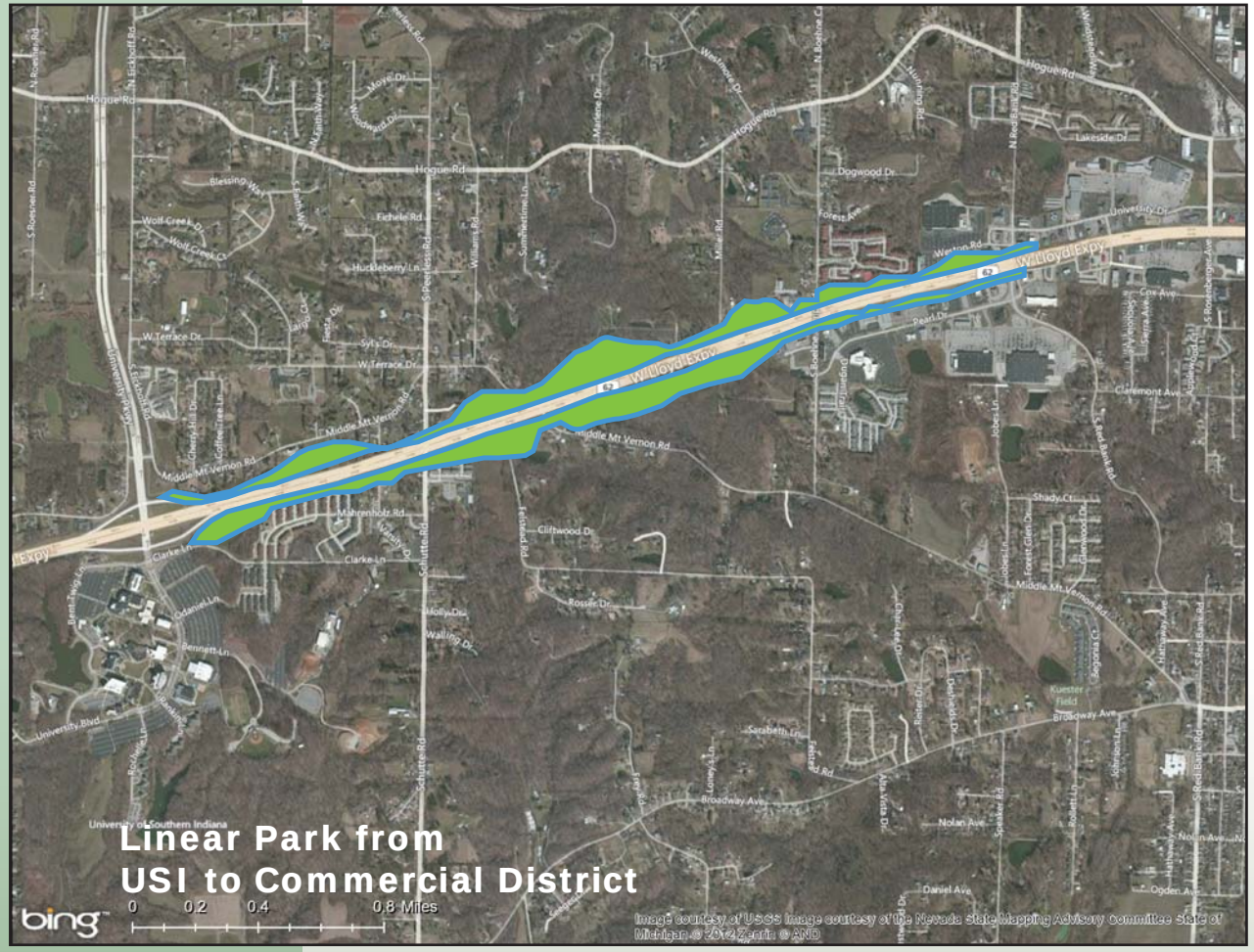
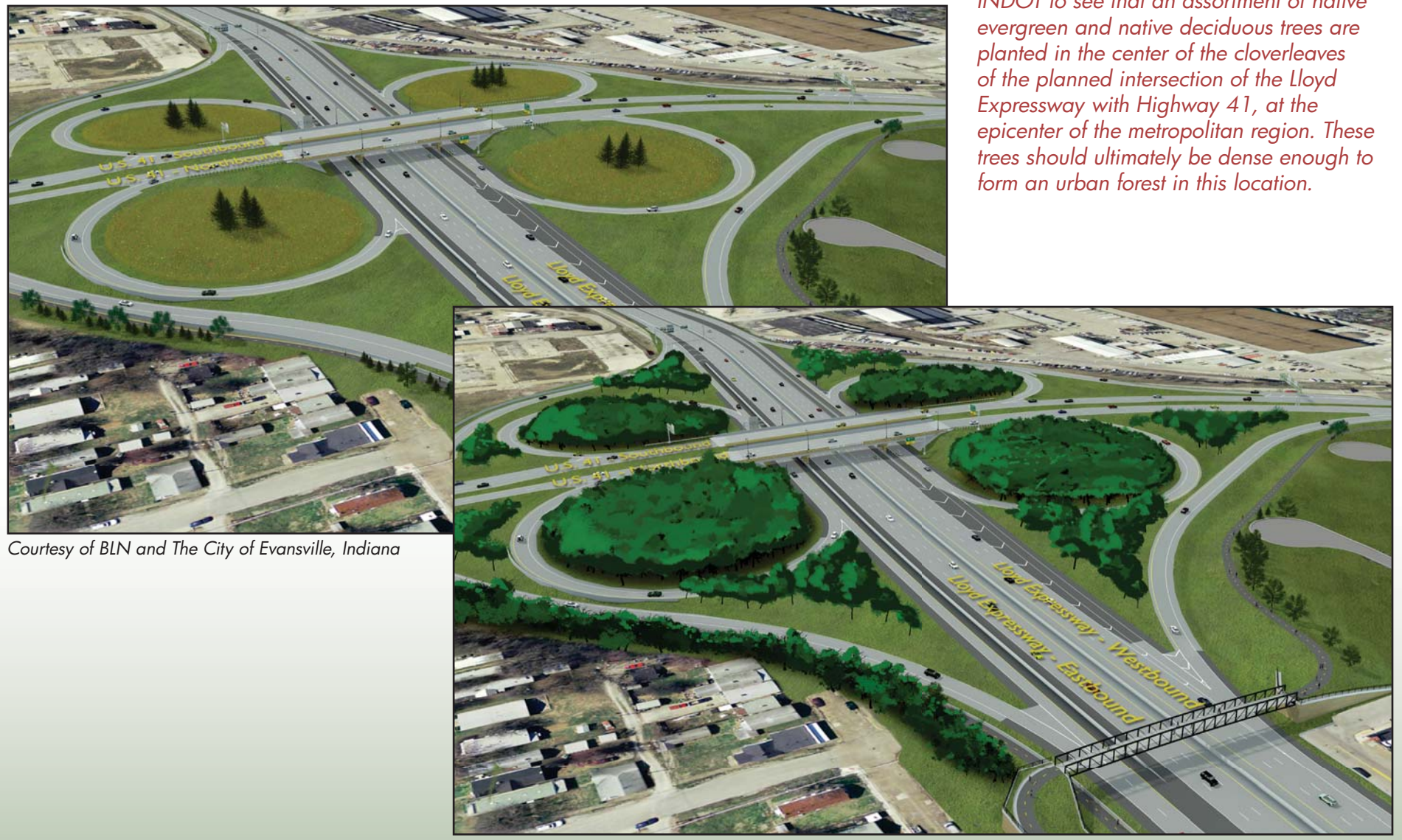


Figure 5-24: Lloyd Expressway & Highway 41 Intersection



Courtesy of BLN and The City of Evansville, Indiana

Courtesy of BLN and The City of Evansville, Indiana
Trees in Cloverleaves added by Bernardin Lochmueller

RECOMMENDATION: *Work with INDOT to see that an assortment of native evergreen and native deciduous trees are planted in the center of the cloverleaves of the planned intersection of the Lloyd Expressway with Highway 41, at the epicenter of the metropolitan region. These trees should ultimately be dense enough to form an urban forest in this location.*

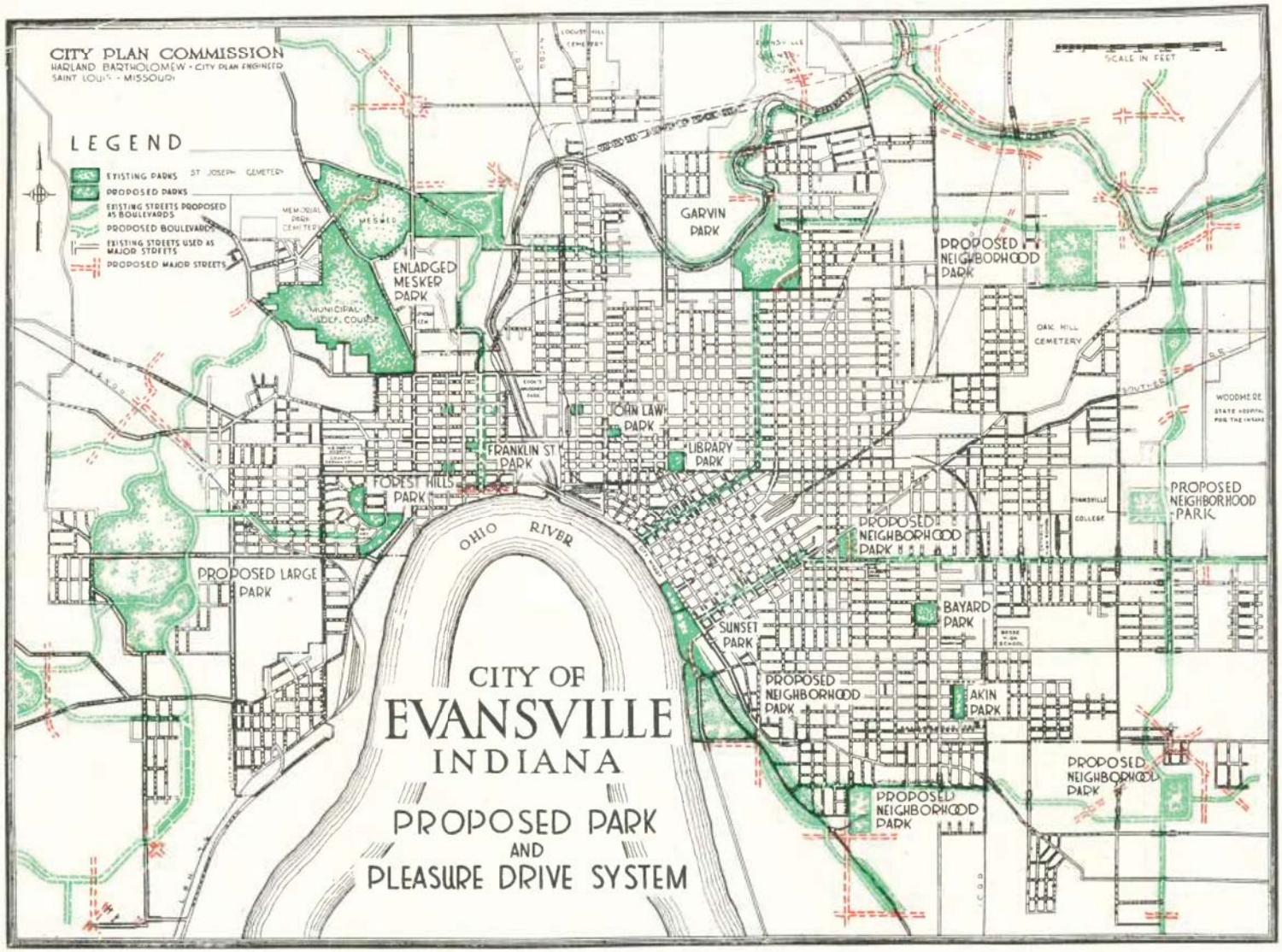
Greenway Passage, Walking Trails, and Bikeway Plan

According to the 2010 Census, of the 87,000 workers in Evansville, only 2,114 reported that they walk to work. The census also reveals that there are almost 6,800 households in Vanderburgh County (about 1 in 11 households) that have **NO** auto vehicle. These families need to rely on public transportation or other affordable transportation alternatives to get to work or school. But between 1966 and 2009, the number of children who bicycled or walked to school fell by 75%, while the percentage of obese children rose 276%. Many parents complain about the lack of sound, safe sidewalks in their neighborhoods, while others express fears related to crime and lack of public safety. For example, the areas surrounding Scott Elementary School in northern Vanderburgh County consist of established middle class neighborhoods. But without adequate trails, bikeways or sidewalks, parents sit in long auto lines, idling before and after school, waiting to pick up and drop off their children, burning costly gasoline and spewing the burned up waste from their tailpipes.

The Evansville Metropolitan Planning Organization has taken a strong lead in organizing citizen groups, private companies, and neighborhood clubs in the planning and implementation of safe sidewalks, pedestrian trails, and connected bikeways. This effort is a part of the multi-modal philosophy of the EMPO, well-supported in public meetings where residents have expressed strong desire for more safe outdoor transportation facilities for walkers and bikers. As mentioned previously, “connectivity” is a key driver in the planning for pedestrians and bicycle users, with connectivity applying at all scales – the local neighborhood scale, the mid-scale county level, and finally, at the scale of the three-county regional area which includes Henderson, Warrick and Vanderburgh Counties. The trails network today, consisting of the Greenway Passage, the USI/Burdette Trail, the Newburgh Rivertown Trail and Wellness Trail, Henderson County’s trails network, along with the trails in our parks and schools are a good beginning. But the regional network still consists mainly of scattered dead-end trails, many leading to nowhere. Strides have been made through the cooperation of private and public entities, with engineering student assistance, and via public works and federal funding, by the various public jurisdictions, to build, connect and maintain good trails and bike paths, but much is left to be done. While many subdivisions have sidewalks, these walks stop at the edge of the development and often do not connect to adjacent subdivisions, making safe walking to school difficult for students.

An important catalyst for expanding the network of pedestrian trails and bikeway corridors is the Evansville-area Trails Coalition. The Evansville-area Trails Coalition is interested in the "connectivity" of civic, educational, and natural features, not only for recreational and leisure-time pursuits, but with a vision of providing alternative modes of transportation that give choices and opportunities aside from the internal combustion engine-powered vehicles requiring petroleum or electrically-based fuels. The Evansville-area Trails Coalition is all about "leg power." Its Vision Statement goes as follows: "Our vision is for a healthy, vibrant community where people of all ages and abilities are walking, biking and using other forms of active transportation as a safe, fun and routine part of everyday activities." Their Mission Statement follows logically from that vision: "Our mission is to promote development, use and maintenance of an interconnected system of greenway corridors, trails, sidewalks and on-road bikeways for active transportation and recreation throughout the Evansville metropolitan area."

Figure 5-25: Greenway Master Plan Map 1927



As early as 1927, the private planning consultant, Harland Bartholomew, expressed the need for a connected greenway. (See Figure 5-25.) The first modern Greenway Passage Plan was drafted, after several public meetings, in 1992 by a team consisting of the Storrow-Kinsella Partnership, VPS Architecture (then known as VPDS), and Bernardin Lochmueller and Associates. The first phase of the Greenway Passage system was completed in 1998, along Pigeon Creek between Kleymeyer and Garvin Parks. The second phase, running down Riverside Drive parallel to Tropicana and along the Ohio River levee to Sunrise Park, was completed in 2003-2004. In the interim, the City of Evansville constructed the downtown Riverfront Esplanade and Dress Plaza Renovation in 2001, making provisions for the Greenway Passage system to run directly through the Esplanade. An interesting part of the Esplanade and Dress Plaza Riverfront Renovation project are the educational markers placed along the river in downtown Evansville, outlining the history of the Ohio River in this region.

The following two figures show the original 1992 Greenway Passage Plan and the recent updated projects map, respectively. The early phases of the Greenway Passage program came slowly, as public funding became available, some of it local and some state, with mostly federal funding.

Figure 5-26: Greenway Passage

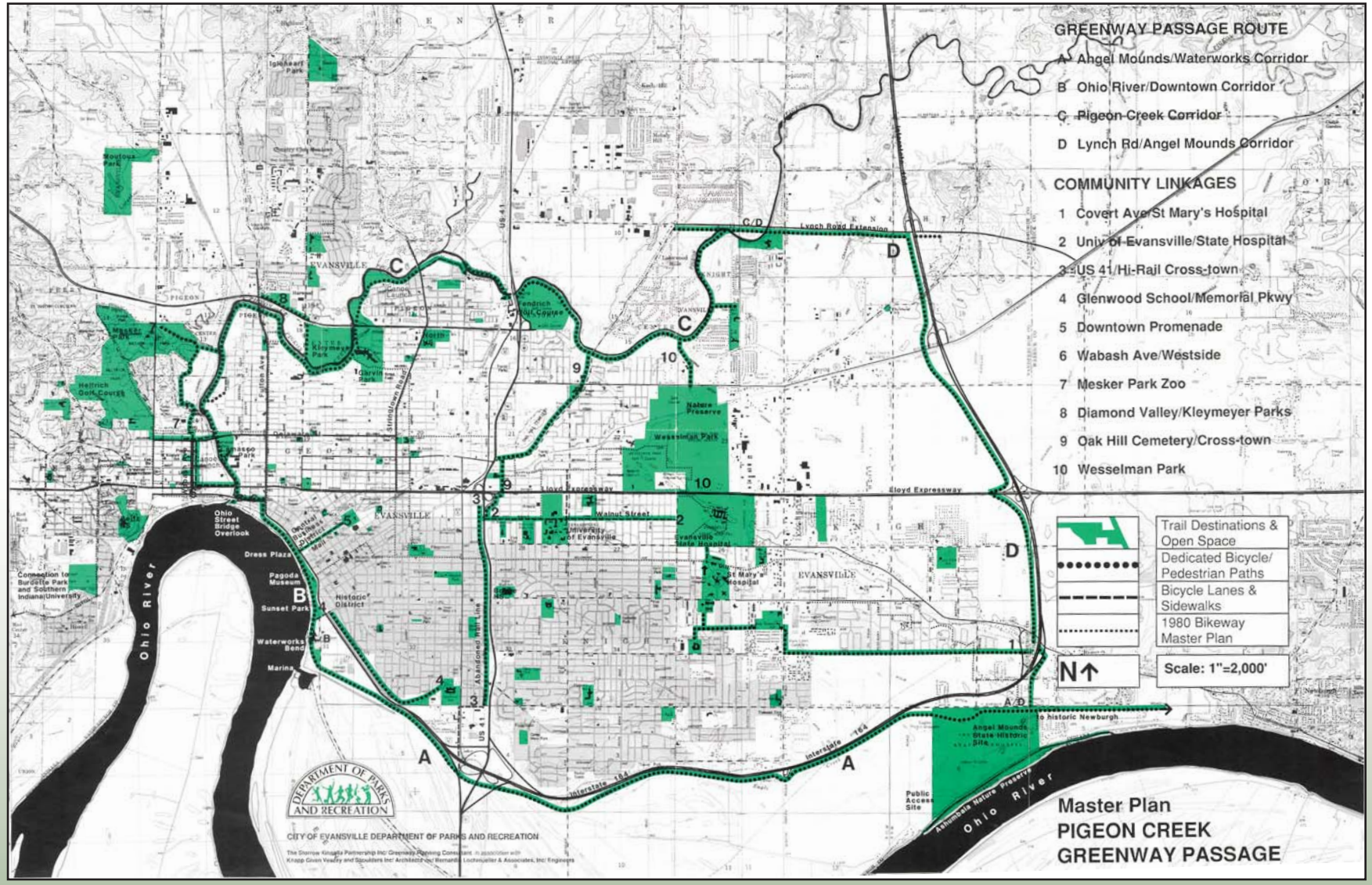
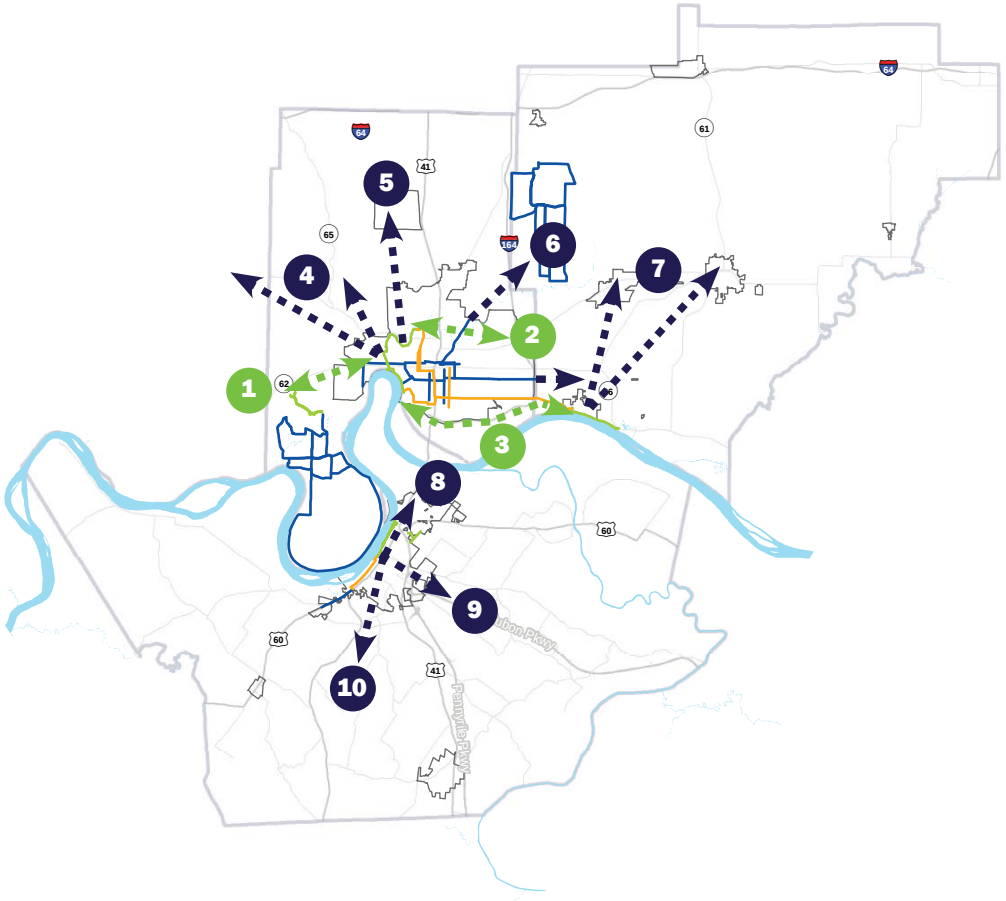


Figure 5-27: Evansville Trails Plan

POTENTIAL PROJECTS
BICYCLE AND PEDESTRIAN



1 GREENWAY CONNECTIONS
USI, Pearl Drive/University Drive

2 GREENWAY EXPANSION
Heidelbach Canoe Launch to Oak Hill Road

3 GREENWAY EXPANSION
Evansville to Newburgh

4 WESTSIDE CONNECTIONS
Franklin Street, Hilltop Neighborhood, Mesker Park Zoo

5 NORTHSIDE CONNECTIONS
Jacobsville, Diamond-Stringtown, North Park, Darmstadt

6 NORTHEAST/WARRICK CONNECTIONS
Oak Hill, Blue Grass Fish and Wildlife Area, Chandler

7 WARRICK COUNTY CONNECTIONS
Newburgh, Chandler, Boonville

8 NORTH HENDERSON CONNECTIONS
North 41 commercial area, Audubon State Park

9 2nd STREET CONNECTIONS
Downtown, Henderson County High School

10 SOUTH HENDERSON CONNECTIONS
East End, Henderson Community College

existing on-street facilities
existing greenway/trail facilities
current projects
potential on-street connections
potential greenway/trail connections

Trails and Bikeways

With the forming of the Evansville-area Trails Coalition in March of 2009, and with its subsequent incorporation as a not-for-profit corporation with tax-exempt status, the prospect of more public-private partnerships is assured for all three counties in the region. The ETC sees the Evansville-area Pigeon Creek Greenway as just a first step in a connected network of trails and safe on-road bicycle lanes throughout the region. Not only is the ETC intent on continuing to plan and implement a comprehensive network of well-designed on-road and off-road bicycle/pedestrian trails, it is determined to implement safety education programs and sponsor public policies that support and encourage cycling and walking. The Indiana Department of Transportation has installed a tunnel under Diamond Avenue so the Greenway can be extended north to First Avenue. The tunnel is barricaded and off limits presently, but could easily be opened up so the Greenway could be extended to Ivy Tech State College. This section of the Greenway would need to utilize a Vectren utility easement, which is not an uncommon strategy.

The next formally-planned section of the Greenway Passage System will extend from Sunset Park through the Glenwood neighborhood, along Sweetser Avenue, and then subsequently connect to the abandoned Hi Rail route parallel to Highway 41 from Riverside to the Lloyd Expressway and then on to Oak Hill Road. These important phases fit neatly with the Greening of Highway 41 concept that we will discuss in Chapter 6, the Millennial Economic Development Plan.

RECOMMENDATION: *All regional localities should adopt a Complete Streets ordinance requiring consideration of pedestrians and bicyclists in the design and construction of any new street or in the resurfacing or reconstruction of any previously existing street. The Evansville Metropolitan Planning Organization Policy Committee should continue to promulgate and implement its Complete Streets Policy, giving priority consideration to alternative modes of transportation in all project design and funding. Sidewalks and/or pedestrian trails should be required to be installed in all public and private developments.*

Courtesy of VPS Architecture

Despite efforts by EMPO, the ETC, local officials, and county Parks and Recreation Departments to promote a substantial trails network in the region, the job is only just barely begun. Cities like Chattanooga; Peoria; Columbia, Mo.; Little Rock and Fayetteville, Ark.; Knoxville; Providence, R.I.; and Eugene, Oregon all have more trails than the Evansville region, by a wide margin. While we have approximately 7 miles of paved greenway passage, Fort Wayne has 76 miles of off-road, paved trails – and it has set a goal of over 100 miles. Indianapolis has two trails networks, the Monon Trail and the new downtown Cultural Trail. Louisville is building a 106-mile loop trail around the city and converting an abandoned railroad bridge (the Big Four Bridge) into a pedestrian/bike bridge across the Ohio River to Jeffersonville, Indiana. And even Owensboro, with a much smaller population than Evansville, has 26 miles of paved greenway.

RECOMMENDATION: *After updating its Bike and Pedestrian Master Plan, the Evansville region should expedite completion of the entire Greenway Passage loop shown on the Greenway Passage Master Plan. Additionally, the region should implement connections between its schools, parks, libraries, and community centers in all three counties by implementing on-road trails and walkways totaling a minimum of* **100 linear miles**.

Courtesy of VPS Architecture

Cultural Trail

The diagram in Figure 5-28 shows the five Cultural Districts recently designated by the Mayor's Taskforce for Cultural Development. For the Cultural Districts Program, the Taskforce will create an Action Plan, in partnership with residents and people who work, study and play in each district. A major part of the effort will also be the development of logos, signage and marketing materials for each district.

Figure 5-29 suggests a possible concept for connecting the Cultural Districts with a Cultural Trail. The phased approach could be funded by several collaborators, including TIF funding, Parks Foundation capital fund drive and Community Development Block Grant funding.

Figure 5-28: Proposed Cultural Districts

Mayor's Taskforce for Cultural Development:

- Oversee the fundraising and development,
- Increase the cultural value and understanding of Evansville as recognized by residents who account for a large portion of out of town visits to the area each year,
- Assist GAGE in selling "quality of life" to potential employers,
- Help employers sell Evansville to potential hires,
- Greatly strengthen the sale (Why Evansville?) by local universities to parents and prospective students.

Cultural Districts Program:

- Create an action plan for each district that is made in partnership with the people who live, work, and play in the district.
- Develop logos, signage and marketing materials for each district. Some of this has already been started in the Haynie's Corner Art District and can be seen at: http://youtu.be/iw-IEpZHeCc

Resource Guide: A tool for "what to do when company comes to town" with local suggestions from across the region, categorized for:

- First-Time Family with Kids
- People on their First Visit
- Guests Who Love History
- People Who've Been Here Before and Want a Surprise
- Visitors Who Can't Get Enough Art and Music

Proposed

CULTURAL DISTRICTS

1. **West Franklin**
   Healthiest urban neighborhood corridor in the state, block after block of historic buildings with local shops, eateries, and a micro-brewery.

2. **Downtown**
   The cultural and historical hub of the tri-state boasts the Victory Theater and the Evansville Philharmonic Orchestra, the Ford Center, Tropicana Evansville and the riverfront esplanade as the apex of the 2012 greenway of the year in Indiana.

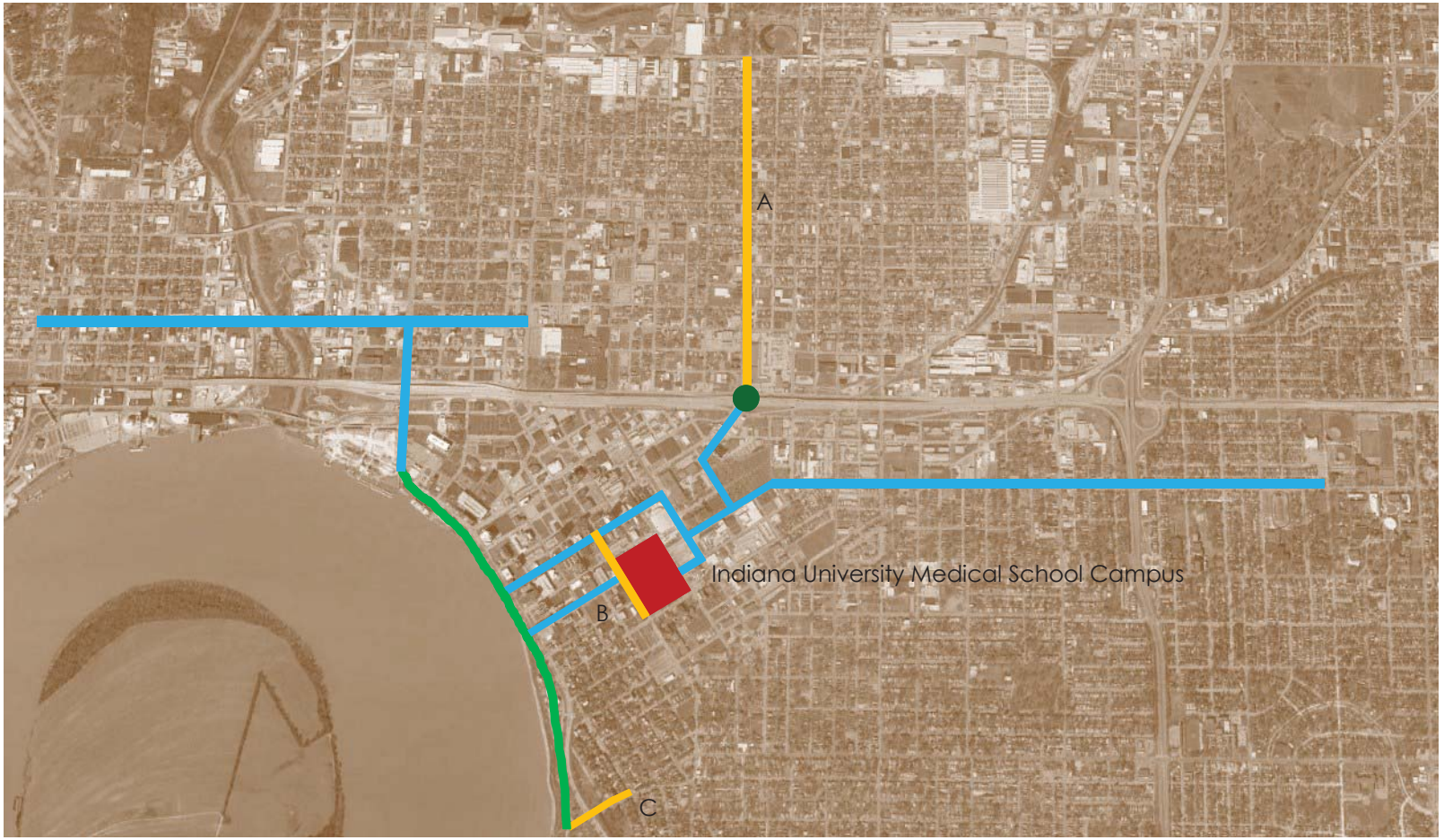
3. **Arts District**
   Anchored by the Haynie's Corner resurgence to the east, the riverfront Museum of Art, History & Science to the west, and in the heart the Riverside historic preservation area – the most complete collection of architectural history in Indiana.

4. **North Main Street**
   Local shops, eateries, and a micro-brewery run up this historic spine of our community to Garvin Park and Bosse Field - the 3rd oldest baseball stadium in continual use.

5. **University of Evansville & Neighborhoods**
   Anchored by an urban university campus with a perennial nationally ranked top 10 theater program, boasts impressive connectivity of green space with the state hospital grounds, future Roberts Park, and the Wessleman Woods Nature Preserve.

Figure 5-29: Cultural Trail Proposal

Cultural Trail Proposal



Cultural Trail Phase 1	Segment A	2014-2015	Jacobsville TIF Funds
	Segment B	2015-2016	Medical School and Convention Hotel Public Sources
	Segment C	2014-2015	Parks Foundation
Cultural Trail Phase 2			(Capital campaign launched after campus announcement)
Downtown, N. Main Gateway		2014	Community Development Block Grant Funds
Existing Greenway			Portion to be included in Cultural Trail upon completion

Courtesy of VPS Architecture

Chapter 6: Millennial Economic Development Plan

"Successful City Planning: Public action that generates a desirable, widespread and sustained private market reaction."

– Alexander Garvin

Introduction

An important aspect of a worthy plan for sustainability is the concept of "economic resiliency" of the southwestern Indiana and northwestern Kentucky region. Economic resiliency entails a diverse local economic base that is capable of responding to aftershocks in the Midwestern and national economies, like those experienced in the 2007-2009 Great Recession. Economic resiliency, likewise, involves workforce development, risk taking, and collaboration at all levels of the public and private sectors. Sustainable development must be viewed as the practice of settled populations arriving at the level of economic and social development that will not inevitably alter the balance of natural ecological systems. [1]

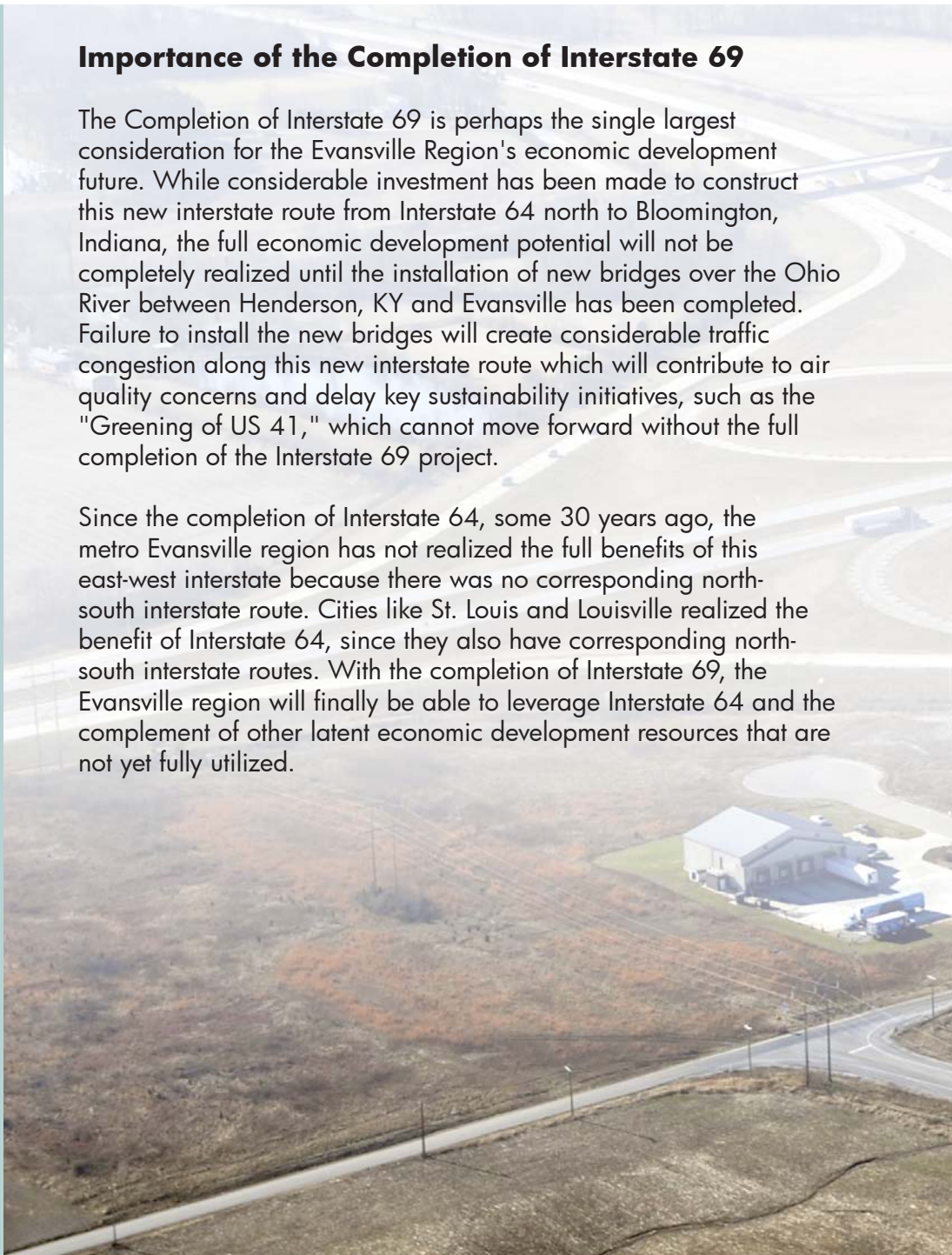
The following economic development initiatives for the 2040 timeline will require a concerted and orchestrated effort, on a daily basis, to prepare the region for innovation and industrious economic development. If all three counties, Henderson, Warrick and Vanderburgh cooperate on a regional basis, their long-term efforts will be rewarded.

1 "Sustainable Development (1987-2005): An Oxymoron Comes of Age," by Michael Redclift, in Sustainable Development 13, no. 4 (2005): 212-27

Importance of the Completion of Interstate 69

The Completion of Interstate 69 is perhaps the single largest consideration for the Evansville Region's economic development future. While considerable investment has been made to construct this new interstate route from Interstate 64 north to Bloomington, Indiana, the full economic development potential will not be completely realized until the installation of new bridges over the Ohio River between Henderson, KY and Evansville has been completed. Failure to install the new bridges will create considerable traffic congestion along this new interstate route which will contribute to air quality concerns and delay key sustainability initiatives, such as the "Greening of US 41," which cannot move forward without the full completion of the Interstate 69 project.

Since the completion of Interstate 64, some 30 years ago, the metro Evansville region has not realized the full benefits of this east-west interstate because there was no corresponding north-south interstate route. Cities like St. Louis and Louisville realized the benefit of Interstate 64, since they also have corresponding north-south interstate routes. With the completion of Interstate 69, the Evansville region will finally be able to leverage Interstate 64 and the complement of other latent economic development resources that are not yet fully utilized.



Redevelopment of Urbanized Areas

The completion of I-69 will create an entirely new dynamic for the Evansville-Henderson urbanized downtown areas. Evansville in particular has a considerable inventory of vacant office space in downtown buildings. The completion of I-69 makes these properties significantly more attractive to the needs and back office requirements of financial services, real estate, and insurance businesses. With the completion of I-69, these properties can evidence easy connectivity to north-south locations. This new connectivity, coupled with attractive and affordable space, should result in new tenants filling most of the current vacancies.

Economic development pressure stemming from the I-69 completion dynamic is a key factor giving strong momentum to the *Millennial Plan for 2040*'s growth and revitalization scenarios. By creating new professional employment opportunities in the urbanized areas of Evansville and Henderson, there will be a considerable interest at all income levels in living proximate to these new employment generators. The trend toward residential and economic "clustering" fits perfectly with the Millennial Plan's vision of promoting more compact and dense development in the urbanized areas.

Planning efforts should begin in earnest for the following:

- Develop an inventory of available space in the downtown areas;
- Understand market analysis of neighboring, larger metro areas to determine what target industries might have an interest in locating a new expansion in the Evansville and Henderson downtown areas;
- Create locational incentives to seize and secure development opportunities;
- Increase local understanding and capacity to negotiate development agreements to seize and secure development opportunities;
- Provide for core urban amenities necessary to attract investment.

Smart Growth for Transportation, Distribution, Logistics

The completion of I-69 will create a new crossroads in the interstate system that will not go unnoticed. Considering that the Evansville metro area is one county south of the Median Center of the US population, business and industry will take notice and this crossroads will become a strategic location.

It would be tempting and relatively easy to promote the wholesale transfer of land to accommodate the needs of the manufacturing, transportation, distribution and logistics industry. Instead the *Millennial Plan for 2040* promotes the accommodation of these industries in a sustainable manner. Therefore, planning efforts should also begin for the following:

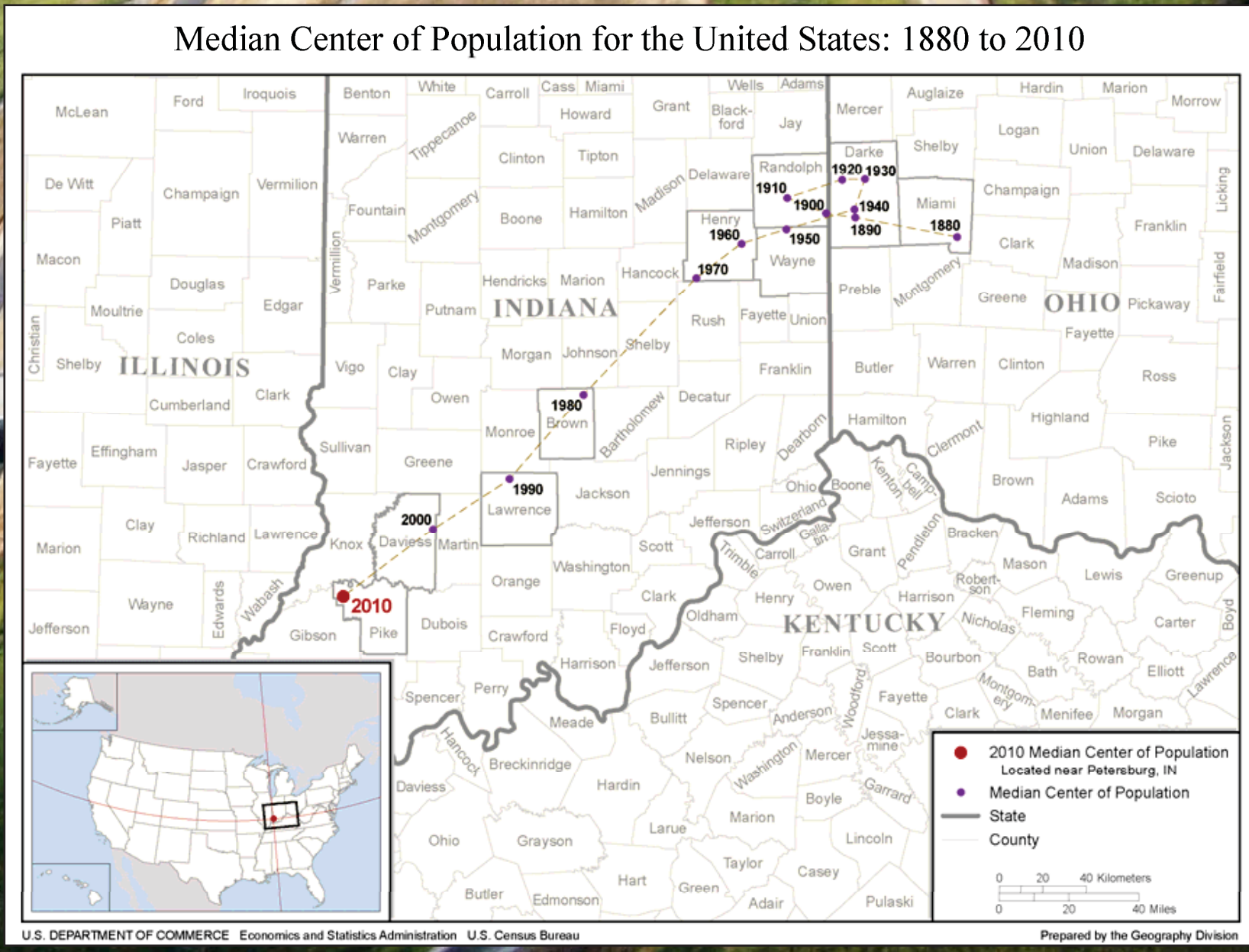
- Assemble key land parcels by ownership, lease, and option. Failure to assemble land in advance of the soon to be completed I-69 will result in lower quality development that will struggle to incorporate sustainable practices that would have the potential to differentiate the area from other lesser markets. It is symptomatic of lesser, inferior markets that they fail to plan in a long term, sustainable manner. Planning for long term sustainability can provide a healthier, more resilient community;

- Prepare development plans for the core infrastructure of the development areas;

- Prepare flexible plans for the subsequent utilization of sustainable development practices as the property is built out. (These could be floating zones that prescribe specific sustainable development applications for given alternative development scenarios.) For example, given roof top and parking lot spaces associated with larger-scale industries, there will be considerable opportunity to pilot economical, sustainable stormwater management and alternative energy concepts.

A new facility, at a strategic location, could also help pioneer efforts associated with delivering new fueling technologies such as compressed natural gas, electric charging stations, and hydrogen fuel cells.

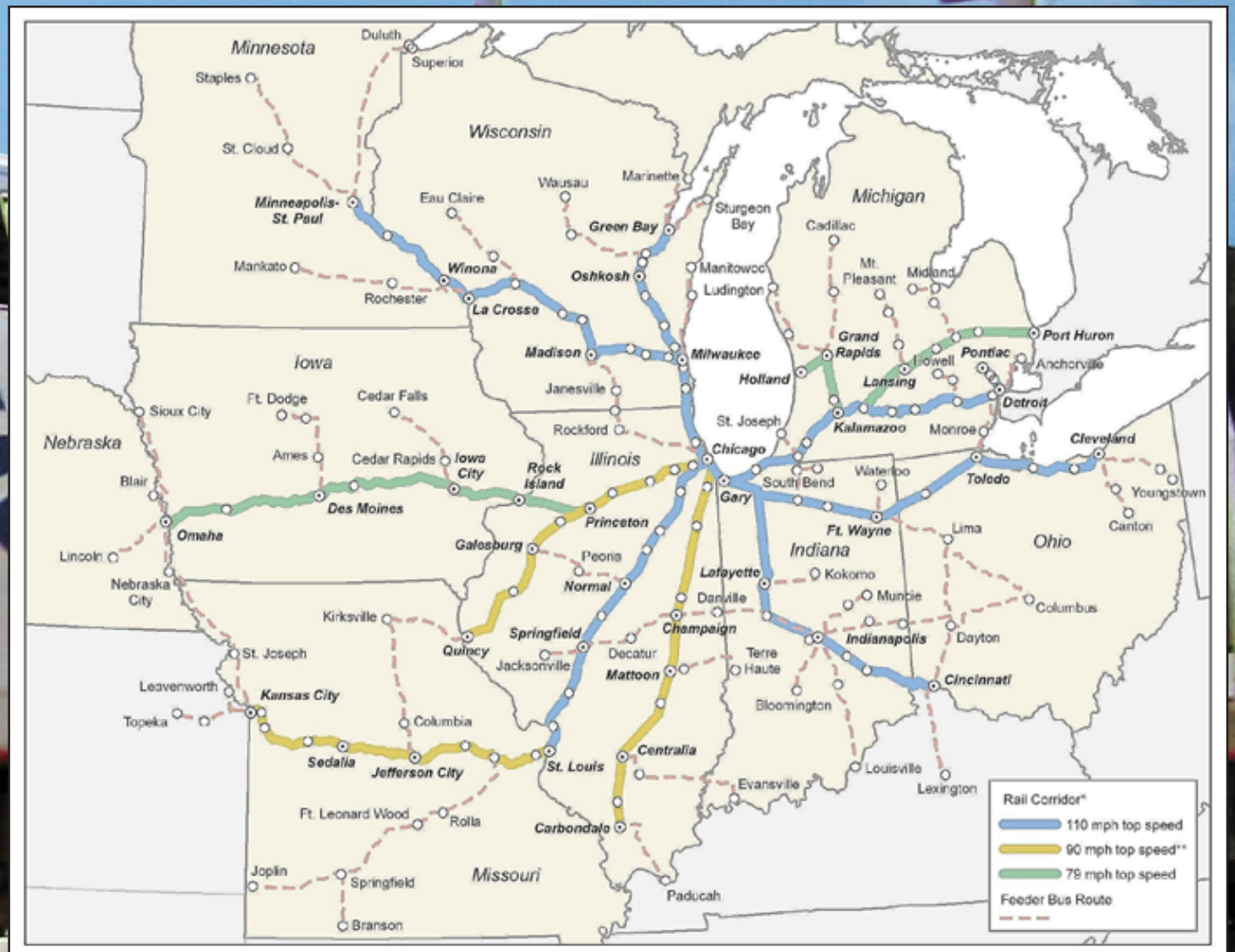
Figure 6-1: Median Center of Population for the United States: 1880-2010



Rapid Rail – AMTRAK Connectivity

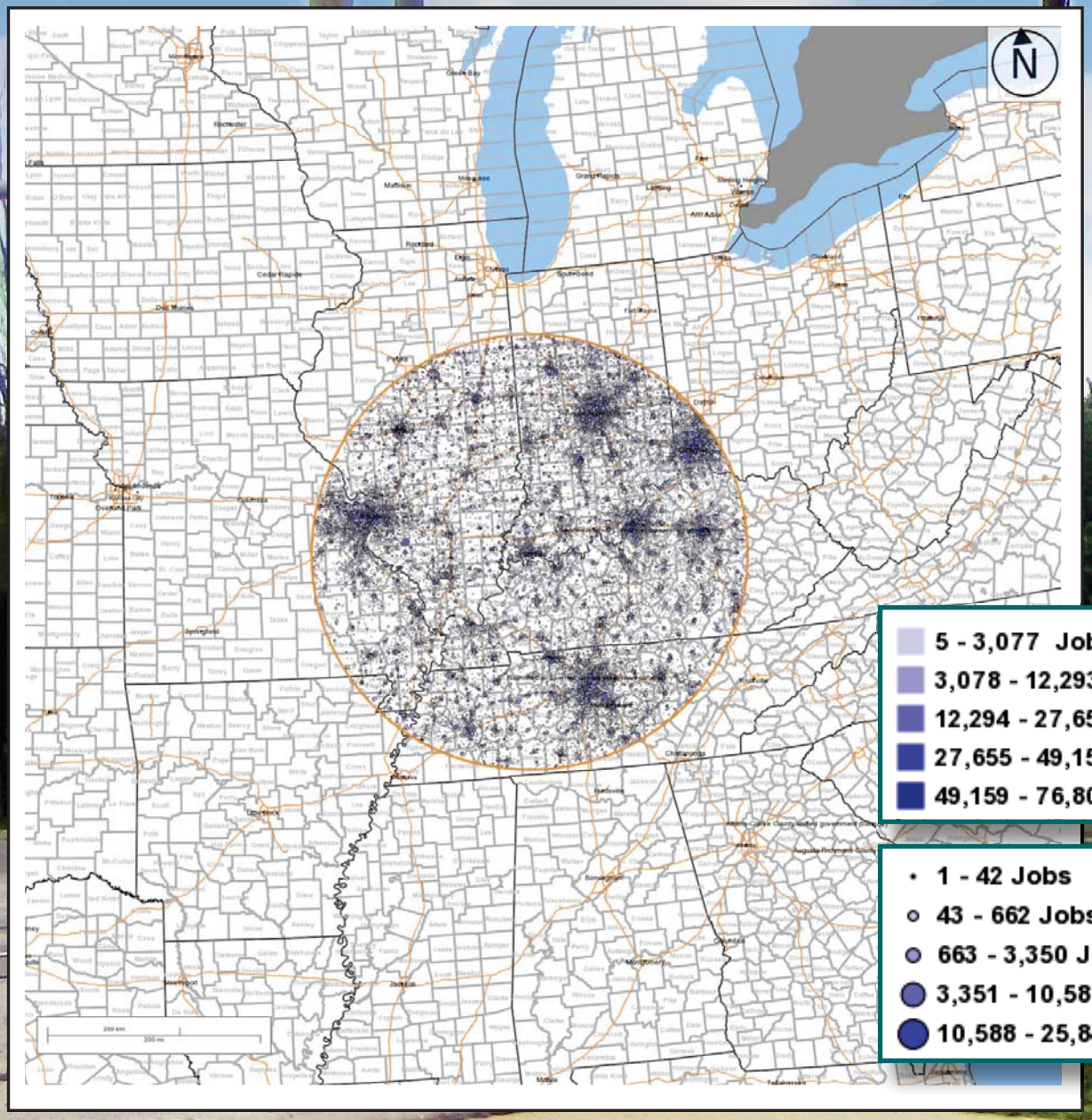
By the year 2040, it is a safe gamble to bet that the southeastern Illinois, southwestern Indiana, and northwestern Kentucky region will be connected to a rapid rail system such as AMTRAK. The Midwest High Speed Rail Association, on its website, indicates at least two possible points of connectivity for this region's link-up with Chicago: (1) utilizing existing rail lines (called blended service) between Evansville and Terre Haute, Indiana; and (2) establishing a direct rail connection to Carbondale, which has an AMTRAK station and is ultimately connected northward to Chicago. The AMTRAK map, shown in Figure 6-2, is an intermediate timeframe solution connecting the Evansville Metro Area to Carbondale using express bus service.

Figure 6-2: Midwest Regional Rail



*Indiana DOT is evaluating additional passenger rail service to South Bend and to Louisville.
**In Missouri, current restrictions limit train speeds to 79 mph.

Figure 6-3: Density of Jobs



Major Economic Development Initiatives

The following initiatives for the 2040 timeline will require a concerted and orchestrated effort, on a daily basis, to prepare the region for innovation and industrious economic development. If all three counties, Henderson, Warrick and Vanderburgh cooperate on a regional basis, their long-term efforts will be rewarded, and jobs per square mile will be the inevitable indicator.

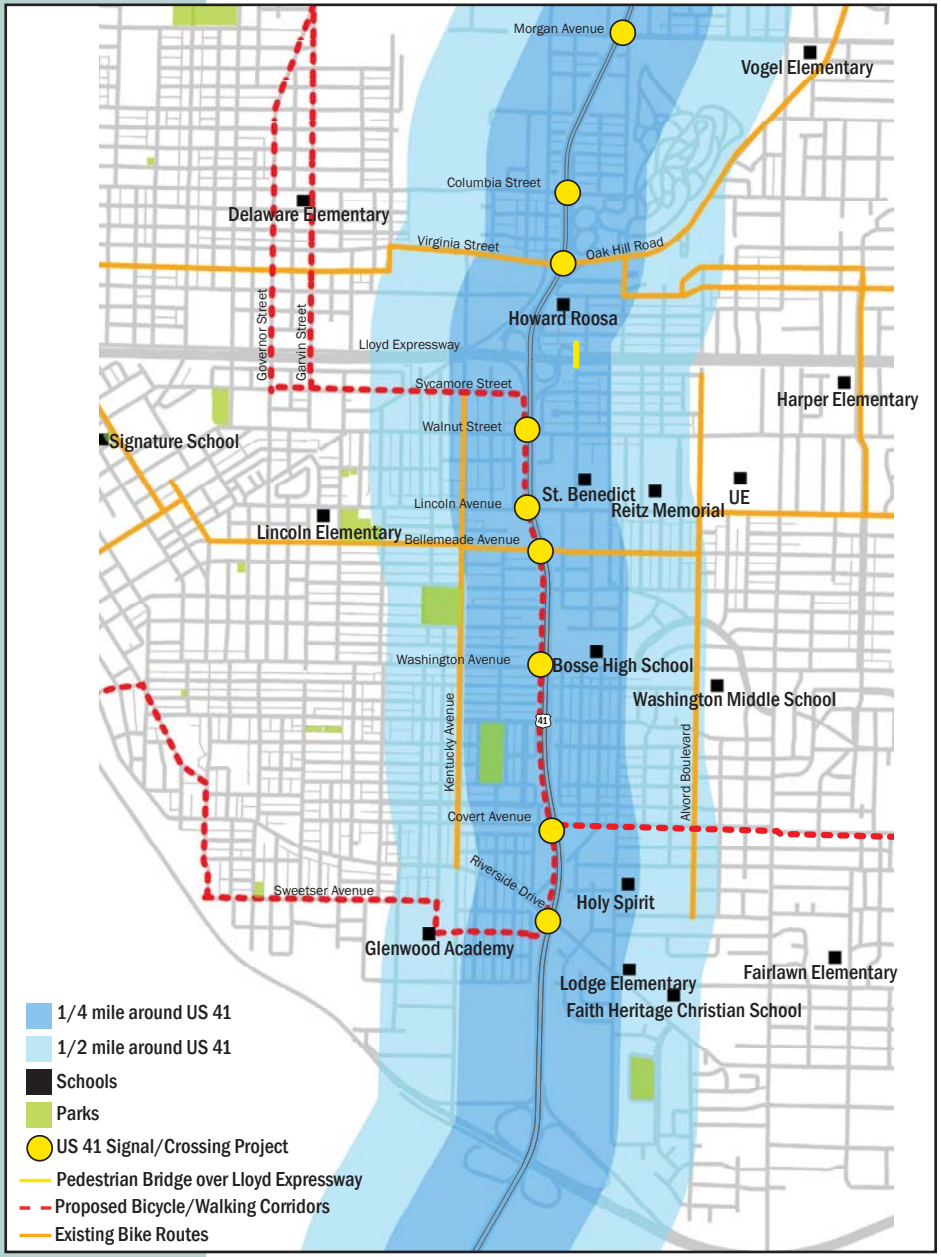
Table 6-1 shows the percentages of the population that live within one half mile, one mile and two miles of US Highway 41. The table makes clear that about one third of the City of Evansville's population lives within one mile of US 41 and two thirds of the City of Henderson's population live within one mile also. Figure 6-4 indicates schools, parks, bike routes and pedestrian corridors in the area south of Morgan Avenue in Evansville, adjacent to US 41.

Table 6-1: Percent of Population Near US 41

Percent of Population Near US 41

	<=1/2 mile	<= 1 mile	<= 2 mile
Evansville	14%	31%	59%
Vanderburgh Co.	29%	26%	50%
Henderson	29%	62%	93%
Henderson Co.	20%	43%	66%

Figure 6-4: Area South of Morgan Avenue, Adjacent to US 41




HENDERSON AREA RAPID TRANSIT
TAKE H.A.R.T.

US 41 Multi-Modal Corridor with Bus Rapid Transit System

With the completion of the bypass loop around Evansville that includes an I-69 connection between Henderson and Evansville linking the former Interstate 164 in Evansville (recently decommissioned and classified as I-69) with the Audubon Parkway in Henderson; plus completion of University Parkway on the western side of Evansville, from the Lloyd Expressway to Interstate 64, the function and character of US Highway 41, the current major north-south truck and auto spine through the middle of both Evansville and Henderson, will change dramatically. Along with the change in function and level of service, comes the opportunity to re-purpose, re-conceptualize, and redesign the character of Highway 41, from Toyota Motor Manufacturing in Gibson County, Indiana, all the way to downtown Henderson, Kentucky.

Figure 6-5: 2040 Regional Highway Loop

US Highway 41 can become progressively more multi-modal in character, serving bicyclists and pedestrians all along its extent, in a safer and greener environment. This redesign effort can be dubbed "The Greening of Highway 41," and will involve all facets of the Evansville and Henderson communities, from not-for-profits such as "Keep Evansville Beautiful" to educational venues and local leaders. With less truck traffic on Highway 41, and with opportunities for transit to connect the Evansville and Henderson downtowns to jobs located in the northern reaches of Vanderburgh County and on to Warrick and Gibson Counties, Highway 41 will be transformed into a more pleasurable and leisurely travel corridor for pedestrians, bicycles, buses and cars. The vision for the new and improved Highway 41 should include native grasses, median plantings, coordinated graphics and signage, as well as murals and public art, all orchestrated to provide a scenic corridor for travelers and residents alike.

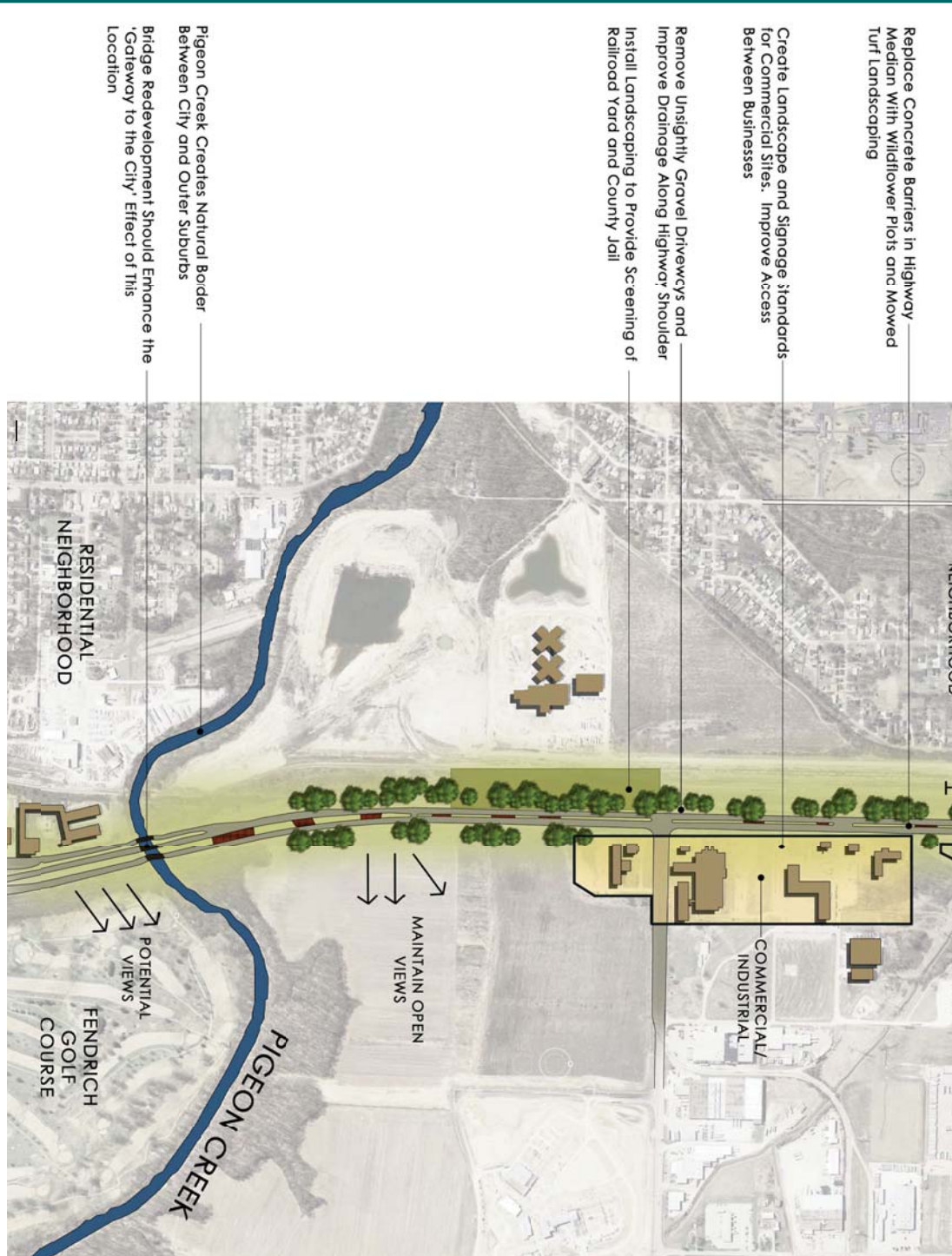
In synchronization and coordination with the "Greening of Highway 41," Henderson, Kentucky is in a position to create a new gateway approaching Henderson from the north. The presence of Audubon Park and the Ohio River wetlands to its east, offers a natural view of the area when motorists cross the Ohio River bridge from Evansville to Henderson. The map shown in Figure 6-6 depicts a wetlands preserve being prepared for conveyance to the Kentucky Department of Natural Resources, in partnership with private river bottom landowners.

In addition to this enhancement of Audubon Park, an opportunity to develop ecotourism facilities along the opposite side of Highway 41 from the Audubon entrance is strong. The site of the old Audubon horserace track and surrounding environs could serve as both a retreat center and an environmental awareness and education area.

Figure 6-6: Henderson Green Gateway

US 41 Multi-Modal Corridor with Bus Rapid Transit System

The opportunity also exists for a dedicated Bus Rapid Transit lane along the western shoulder of Highway 41 in Evansville at locations where the railroad line exists. A set of bus lanes can, in most cases, fit easily within the space between the highway and the rail line, with agreement from the railroad to use available space. In other locations, right of way may need to be acquired from private owners on either side of Highway 41. The accompanying illustrations show portions of the "Greening of Highway 41," from the US Highway 57 intersection and southward to the Pigeon Creek Bridge; and along the 41 commercial strip in Henderson. The US Department of Housing and Urban Development (HUD) has suggested that future priority for federal housing funding is likely to be given to affordable housing projects that are compact and located near transit lines. Along with the "Greening of Highway 41," it is envisioned that multifamily housing sites along Highway 41 will be given priority in rezoning, swift permitting, and developer incentives such as density bonuses.



Courtesy of Hafer Associates and Keep Evansville Beautiful

US 41 Multi-Modal Corridor with Bus Rapid Transit System

Along with a change in character of the Highway 41 corridor comes the opportunity to emphasize all modalities and enhance safety for pedestrians and bicyclists. Effective Bus Rapid Transit, in most US cities, consists of dedicated bus lanes with stops at about one mile intervals. The buses themselves are sleek, attractive, modern vehicles that are comfortable inside and have a clean, safe feeling. The cross-section below shows how the present lanes could be transformed to accommodate a set of dedicated bus lanes and a dedicated bicycle lane. This condition is obviously not present along the entire extent of the present Highway 41, but over the next 25 years, with foresight and good planning and budgeting, the desired transformation can take place.

In addition to the "Greening of Highway 41," the implementation of dedicated Bus Rapid Transit lines implies an east-west system that complements the north-south 41 transformation and links up with the WATS system in Warrick County. The consultants are also presently studying the possibilities of a shuttle bus line that would run from the METS transfer center in Evansville, and connect to the HART system in downtown Henderson. This shuttle bus line would start the process of connecting the downtowns in Evansville and Henderson with bus service shuttling between the two urban areas.

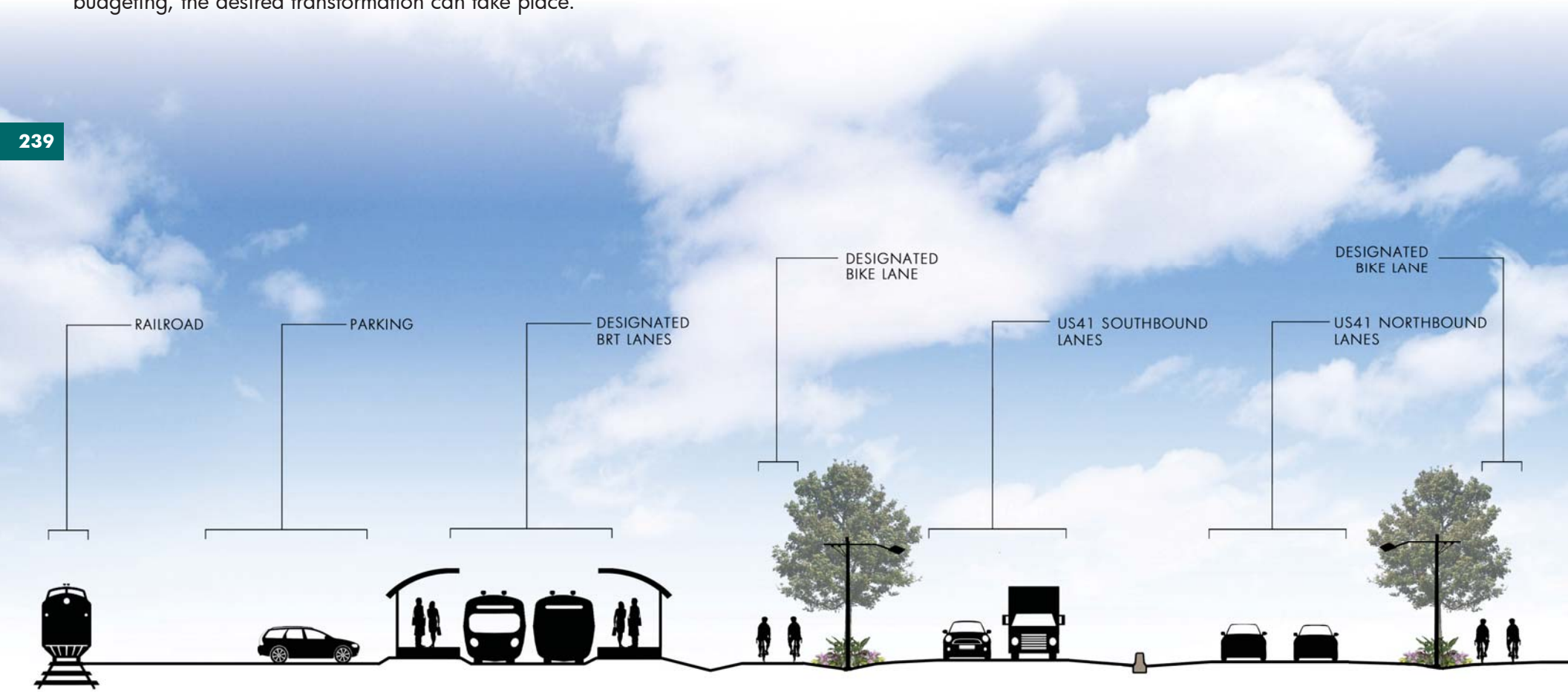


Figure 6-7: METS HART Shuttle

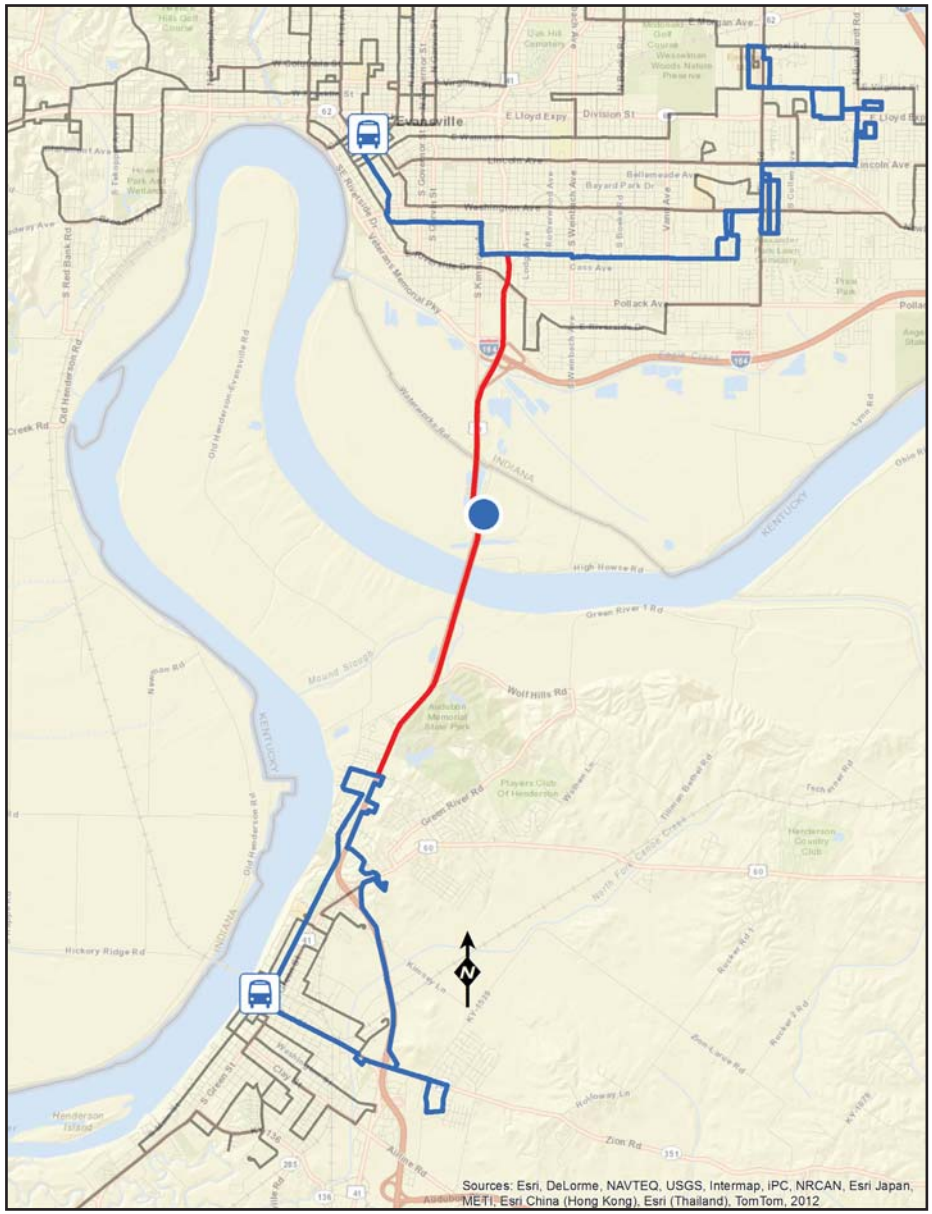
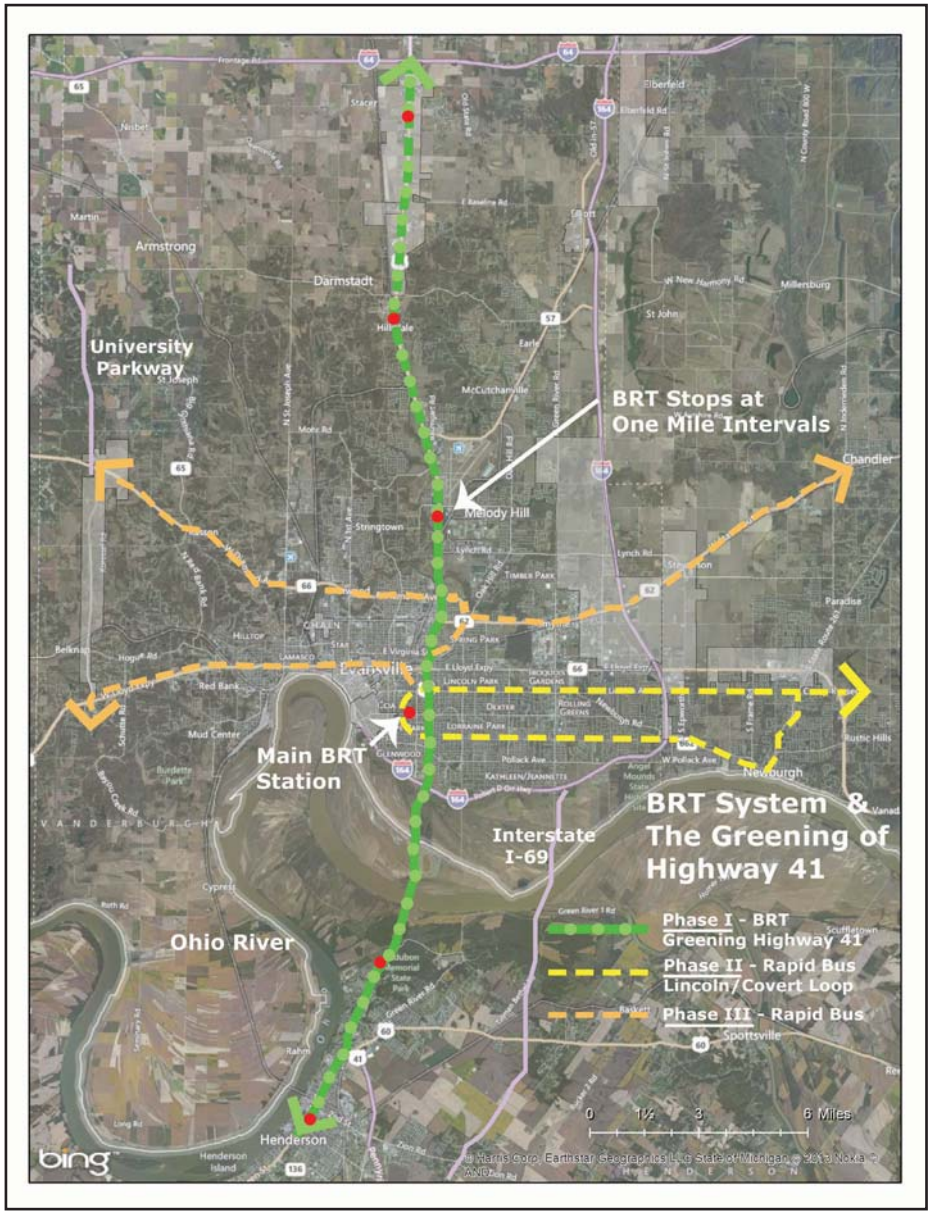


Figure 6-8: BRT System and the Greening of Highway 41



US 41 Multi-Modal Corridor with Bus Rapid Transit System

Characteristics that distinguish a BRT system from a more conventional bus system are the following:

- **Dedicated running ways** – Dedicated lanes allow buses to operate apart from the auto traffic.
- **More frequent service** – Buses in the BRT system typically maintain headways of about 15 minutes.
- **Level boarding and onboard amenities** – Platforms that allow riders to walk straight into the bus are attractive to riders and promote speed boarding. Riders do not have to go up and down any stairs. Levelized boarding means safer on-loading and off-loading of passengers.
- **Off-board fare collection** – Passengers can pay for their trip prior to boarding the bus.
- **Greater distances between stops** – Allows the BRT vehicles to achieve greater speeds, with more reliability.
- **More substantial stations** – Substations have seating opportunities, real time arrival and destination information in digital format, and more shelter from inclement conditions.
- **Unique branding** – Distinguishes the BRT system, making it easier for prospective riders to identify, understand and use it.

RECOMMENDATION: *Hire a transit planning consultant to conduct a Comprehensive Operations Analysis on the METS bus system in order to evaluate present routing, stops, and timing. Implement a dedicated Bus Rapid Transit lane and a continuous bicycle lane along Highway 41 from Toyota to downtown Henderson, Kentucky. The METS Comprehensive Operations Analysis (COA) should also examine the best east-west Rapid Bus lines, studying options such as Lincoln Avenue or Covert Avenue into Newburgh (or a loop using both), Diamond Avenue, Lloyd Expressway from USI to downtown Evansville, and Oak Hill Road/Morgan Avenue to Chandler, Indiana.*

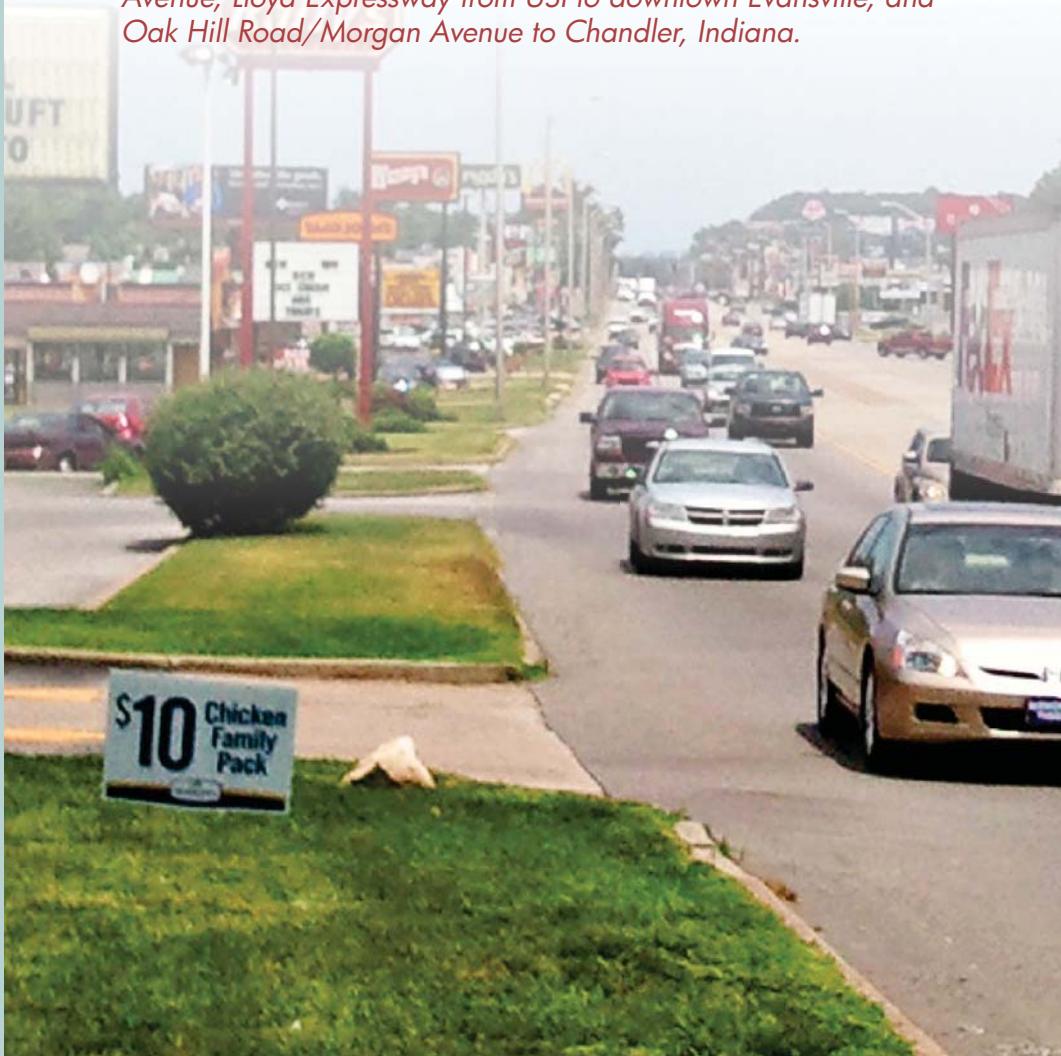


Figure 6-9: Greening of Highway 41 in Henderson, KY

US 41 Multi-Modal Corridor with Bus Rapid Transit System

RECOMMENDATION: *Implement the Highway 41 Bus Rapid Transit system and the east-west Rapid Bus System in the following sequence.*

Stage 1: *Begin the Greening of US41 Corridor*

- *Tasks: improve pedestrian access at intersections along US41; construct bicycle trail along old rail line; plantings and trees along US41.*
- *Time Frame: 2014 to 2015*

Stage 2: *Shuttle between Henderson, Kentucky and Evansville, Indiana*

- *Tasks: develop an operations plan for a shuttle bus between Henderson and Evansville; obtain funding for the bus; implement shuttle bus.*
- *Time Frame: 2014 to 2016*

Stage 3: *Express Bus Service along US41 Corridor*

- *Tasks: build upon the existing bus service on US41 and develop an operations plan for express bus service along the US 41 corridor that could include stops in Henderson, Evansville, Vanderburgh County, Gibson County; the plan includes recommendations for revisions to METS and HART; obtain funding for the service; implement service.*
- *Time Frame: 2016 to 2020*

RECOMMENDATION: *The three counties of Vanderburgh, Warrick, and Henderson, with the help of the Evansville Metropolitan Planning Organization, should discuss, investigate and research the possibilities for a Regional Transit Authority that would have jurisdiction in the three-county EMPO area. The Transit Authority would be charged with investigating the possibilities for a regional BRT and Rapid Bus system, and for further linkages between the three individual bus systems operating in the three counties.*

Stage 4: *Bus Rapid Transit along US41 Corridor*

- *Tasks: develop a plan for a bus rapid transit system servicing Evansville, Henderson, and Warrick County that includes US41 as the north/south route and other possible routes serving the Evansville east and west sides as well as portions of Warrick County; recommend changes to the Evansville Comprehensive Plan and Henderson Comprehensive Plan to provide for higher densities of development along US41; obtain funding for the US41 service; implement the service along US41.*
- *Time Frame: 2020 to 2025*

Stage 5: *Rapid Bus systems servicing other parts of Evansville and Warrick County*

- *Tasks: obtain funding for other portions of the Rapid Bus System; implement this additional service; work with city and county administrations to encourage higher densities along the BRT and Rapid Bus corridors, especially the US41 corridor.*
- *Time Frame: 2025 to 2030*

RECOMMENDATION: *Once a Regional Transit Authority has been created, the new Authority should take a serious look at Car-Share and Ride-Share systems Best Practices from other communities to determine approximate costs for establishing Car-Share or Ride-Share systems to supplement the planned Bus Rapid Transit Lines. The Car-Share and/or Ride-Share systems would aid BRT riders in getting from BRT stops to places of employment, recreation, or shopping and back again. The private sector should also get involved with the process by implementing a series of "bike depots," having a wide variety of bikes to rent for short periods to enhance connectivity.*

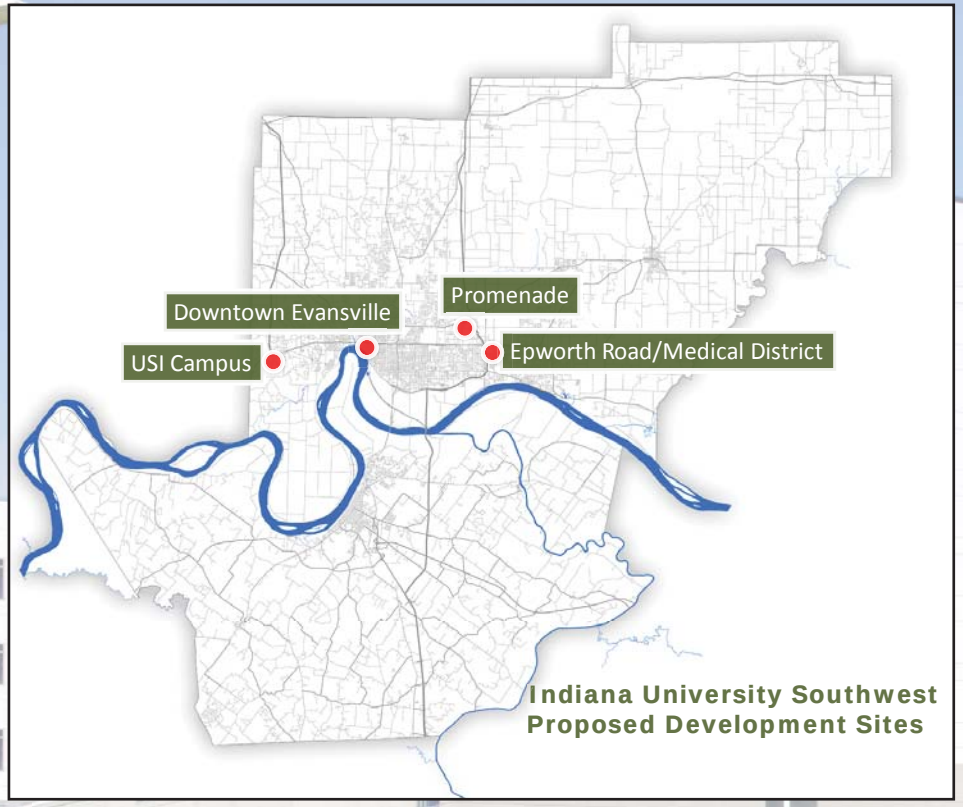
Epworth Road and Highway 66 Medical District

Located near the former I-164 (now I-69) and Lloyd Expressway cloverleaf intersection where Vanderburgh and Warrick Counties meet is the Epworth Road/Highway 66 Medical District, which also includes the Warrick Wellness Trail. This location is ideally suited to become the regional healthcare hub, within 56 miles of ten (10) Indiana counties, eight (8) Kentucky counties and four (4) Illinois counties. Major healthcare providers, Deaconess and St. Mary's Hospitals have already established prominent locations along this corridor. And now, supporting medical services such as outpatient facilities, oncology specialists, nursing studies programming, private doctors' practices, and medical support facilities have located in the medical cluster.

The Epworth Road and Highway 66 Medical District is also one of the candidate sites for the location of the Indiana University Medical School-Southwest Indiana Campus. The project will develop into an entire interdisciplinary academic health science education and research campus. The new campus will include a wide variety of undergraduate and graduate health education programs in partnership with Ivy Tech, USI and UE, plus four regional hospitals. According to Dr. Steven Becker, Director of the program, the new facility will be between 100,000 to 125,000 square feet in size. The cost, including land, technology, engineering, and construction will be between $35 - $50 million. Studies by Pittsburgh-based consultant, Tripp Umbach, project a direct impact of $280 million annually to the regional economy. Indiana University is expected to decide on its favored site in early 2014. There are at least four potential sites for the new facility. The four potential sites are:

- University of Southern Indiana Campus
- Downtown Evansville, Indiana
- The Promenade – A Private Development on Evansville's Eastside
- Epworth Road and Highway 66 Medical District in Warrick County.

Figure 6-10: Four Potential IU Southwest Sites

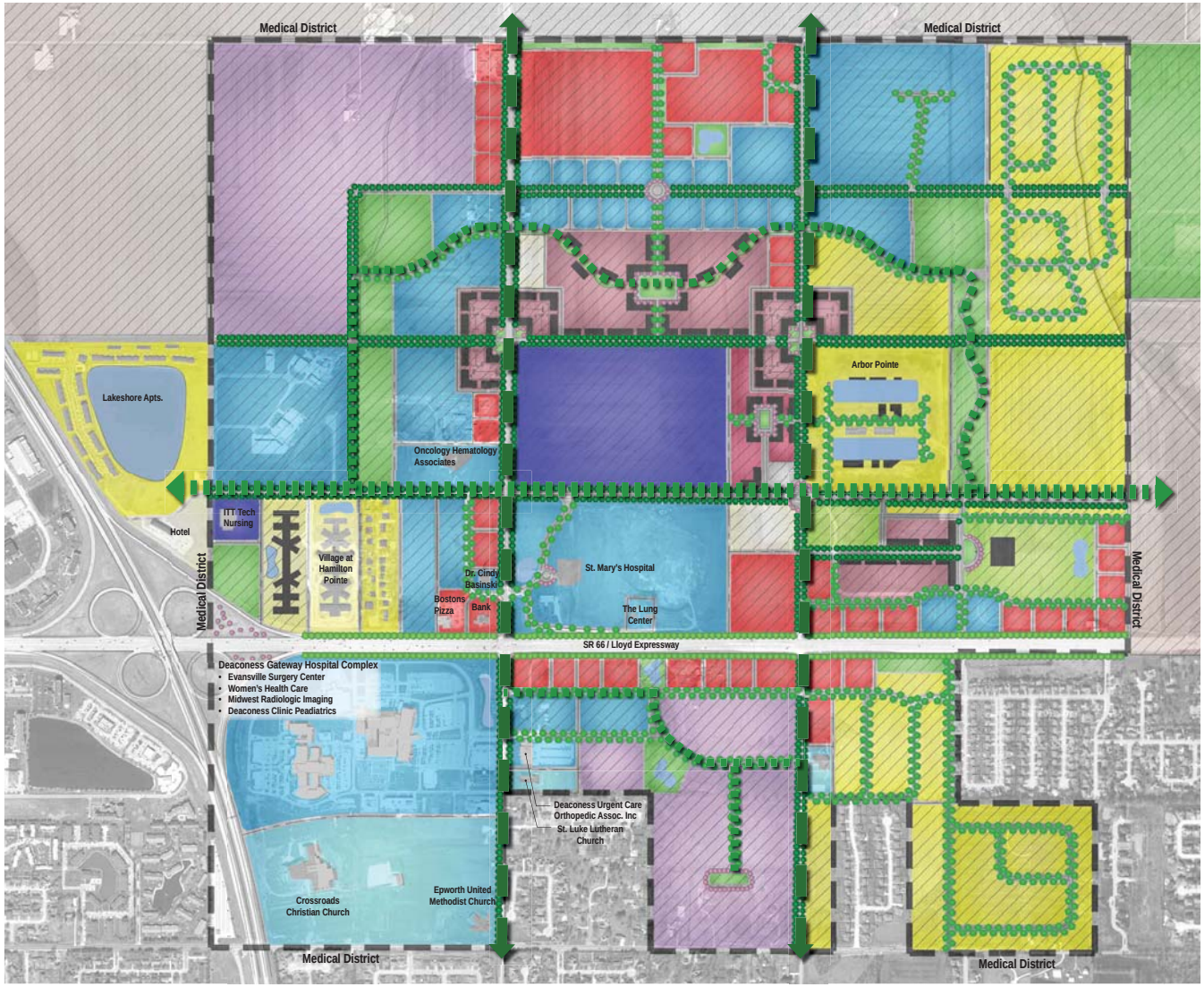


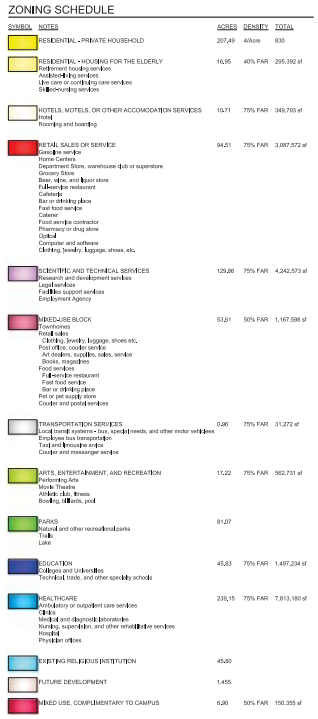
The accompanying diagrams show the potential location of the Indiana University Medical School-Southwest Indiana Campus, if it were to locate along the Warrick Wellness Trail. See dark violet area in center of map designated for medical education. The purpose of showing the Indiana University location is to depict the build-out possibilities of the Warrick Wellness Trail and the Epworth Road and Highway 66 Medical District, **but not to imply that the Warrick site is preferred over the other three sites** for the IU Campus. It is assumed that if Indiana University does not elect to locate in Warrick County, the Warrick Medical District will attract other types of medical related businesses, practices and land uses. At this writing, neither USI nor the City of Evansville have made their preferred sites public.

RECOMMENDATION: Warrick County should classify the Epworth Road and Highway 66 Medical District an Innovation District and should retain professional consulting services to formulate the district as an overlay to existing zoning. Innovation Districts imply special design requirements and Form-Based Code implications in order to achieve the desired scope, scale and character of the district regarding building siting, parking configuration, landscape features, lighting engineering, and signage standards.

Epworth Road and Highway 66 Medical District

MEDICAL DISTRICT MASTER PLAN





WARRICK COUNTY, INDIANA

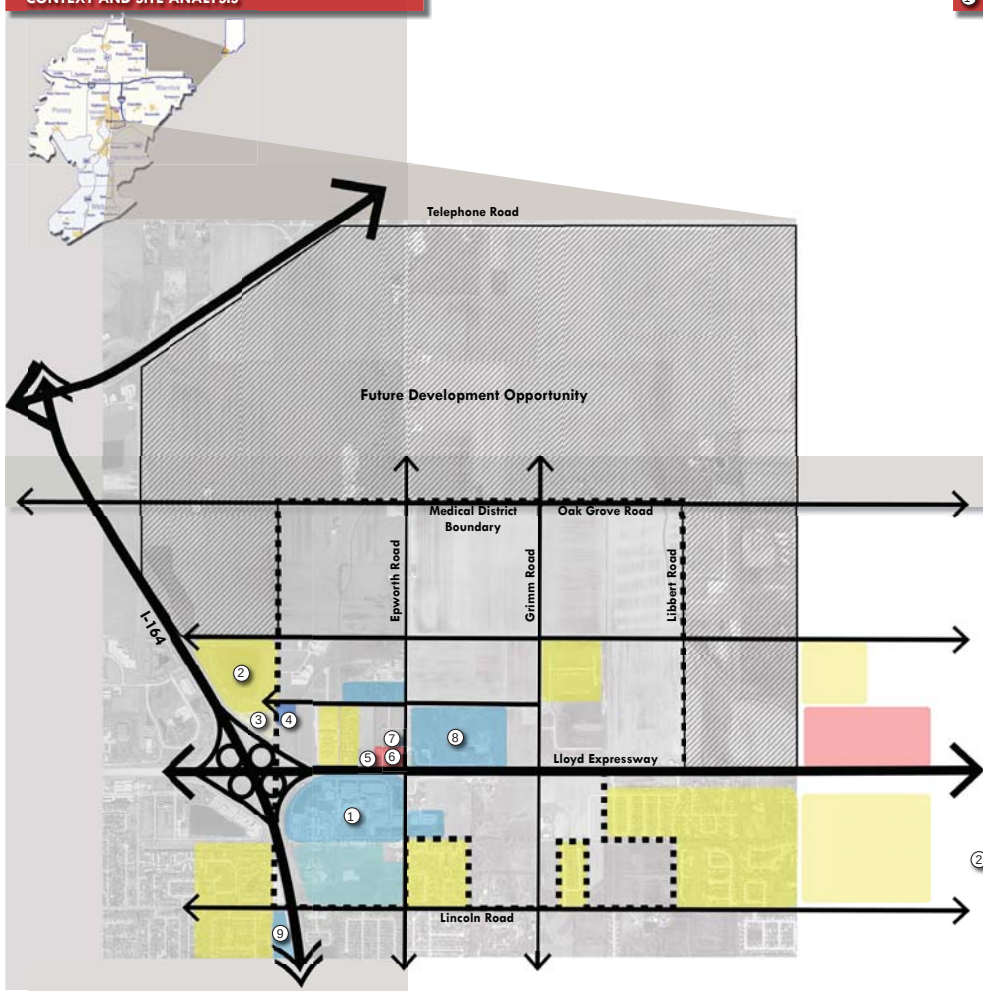
Success Warrick County
Warrick Wellness Trail
October 2, 2013

synthesis

Courtesy of Synthesis and the Warrick County Economic Development Department and Success Warrick County

SITE CONTEXT

CONTEXT AND SITE ANALYSIS



1 DEACONESS GATEWAY COMPLEX


Deaconess Hospital


Deaconess Clinic


Deaconess Women's Hospital


Gateway Medical Building


Evansville Surgery Center


Lakeshore Apartments


3 Value Inn


4 ITT Technical Institute


5 Boston's Gourmet Pizza


6 German American Bank


7 Medical Practice Office


8 St. Mary's Hospital

9 ADDITIONAL SUPPORTING USES


Dentist Office


Angel River Health and Rehab


Pollux Medical Billing Services


Periodontics Practice


Vein Center and Family Practice


Atria Newburgh Senior Living

Success Warrick County
Warrick Wellness Trail

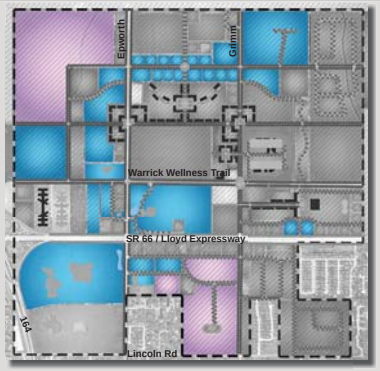
synthesis

Courtesy of Synthesis and the Warrick County Economic Development Department and Success Warrick County

Epworth Road and Highway 66 Medical District

LAND USE & CHARACTER SKETCHES

BIOTECH, RESEARCH AND OFFICE PARK



Key:
- Healthcare
- Scientific and Technical Services

- **Prime location for development** in close proximity to regional healthcare hub of southwest Indiana with planned infrastructure to support immediate delivery of prime building pads.
- Unique opportunity for **collaboration with established healthcare network**, academic institutions, and supportive health services to communicate and coordinate activities
- An environment that **promotes the growth and development of supportive medical research based companies** to locate to the region with ample room for expansion
- Supportive of academic/health/science center model sustained by a location offering advanced medical facilities, healthcare workforce development, and renowned academic institutions
- Accessible by transportation system for **interstate commerce**


Existing Deaconess Gateway Hospital


Existing Deaconess Women's Hospital


Existing Orthopaedic Associates


Existing Oncology Hematology Associates

LIFESTYLE, RETAIL AND RESIDENTIAL

Key:
- Mixed-Use
- Mixed-Use, Complimentary to campus
- Retail Sales or Service
- Residential
- Arts, Entertainment and Recreation

- **Site amenities** to support employment centers, hospitals, and existing residential
- Retail opportunities, fine dining, and fast food centers to support residents, future students, and commuters.
- **Entertainment district** offers indoor amusement and theater, outdoor attractions, connection to recreation, and respite.

- Capacity for housing is arranged on site as single family, townhouses, and multifamily options that provides **transition zones between uses** through density and building mass.
- **Green space network** weaves in and through this district offering safe and accessible **pedestrian connections**.
- Vehicular parking is generous and will be located throughout the area for **convenience and safety** of users, and pedestrians traversing the spaces.
- Ample **opportunity for expansion** as the area is recognized as a top level commercial area


Existing Senior Housing


Lakeshore Apartments

Success Warrick County
Warrick Wellness Trail

synthesis

Courtesy of Synthesis and the Warrick County Economic Development Department and Success Warrick County

LAND USE & CHARACTER SKETCHES

GATEWAYS, CONTEXT AND COMMUNITY

Key:
Gateway Opportunities

- Proposed **gateway elements** at highly visible intersections of Epworth and Grimm Road north of Lloyd Expressway will entice and attract economic development, visitors, consumers, students, and residents
- Highlighting one's **'arrival to the district'** and the **ease of accessibility to the interstate system** supporting commuters, retail, and transit

- Defines an expression of the **'sense of place'** and **district character** while offering unique branding opportunities
- Scaled versions of gateway elements, signage, and structures will **emphasize entrance** to other 'special locations' within the district – such as the Integrated Healthcare Campus, Medical districts, Lifestyle and shopping opportunities


Existing Roundabout


Existing Signage

Existing Signage

PARKS, TRAILS AND GREENWAYS

Key:
Parks / Greenways

- Provides **internal connectivity** throughout the property for pedestrian, bicycle, and multi-modal transportation options to parks and open space, playgrounds, transit hub, dining, retail, healthcare, campus, and residential locations

- Supportive of connection to existing **Warrick Wellness Trail, Rivertown Trail Greenway** system and **Pigeon Creek Trail** system
- Offers **sustainable design** throughout trail networks as habitats and site ecology are protected as an extension of naturalized green spaces.


Existing Wellness Trail

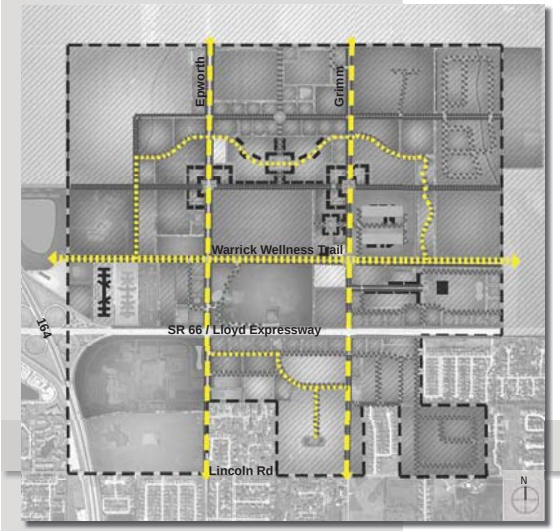
Success Warrick County
Warrick Wellness Trail

synthesis

Courtesy of Synthesis and the Warrick County Economic Development Department and Success Warrick County

LAND USE & CHARACTER SKETCHES

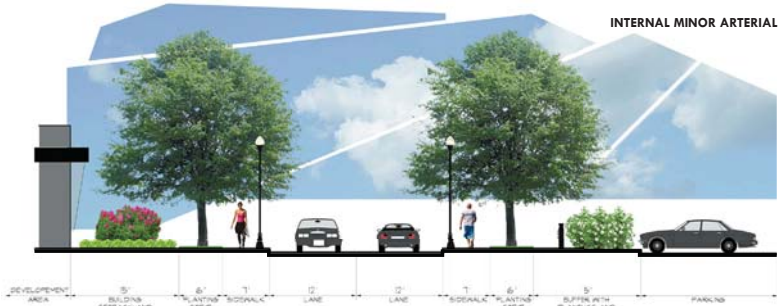
CIRCULATION



Key:

- Internal Minor Arterial
- Major Arterial
- Warrick Wellness / Stahl Road

INTERNAL MINOR ARTERIAL



- Circulation in and through the property will be **unique to the district**
- Major and Minor Arterials are designed for **pedestrian safety**, offering proportion and scale, while still suggesting through materials the character of the development
- The **Warrick Wellness Trail is expanded** to include both sides of Stahl Road through the defined district.

MAJOR ARTERIAL / EPWORTH & GRIMM

- **Planted medians** are suggested in locations throughout the sections of roadways offering scale, color, and optimum settings for landscaping, signage, and **district identification** such as banners.

WARRICK WELLNESS TRAIL / STAHL ROAD

Success Warrick County
Warrick Wellness Trail

synthesis

Courtesy of Synthesis and the Warrick County Economic Development Department and Success Warrick County


The Women's Hospital
4199 Gateway Boulevard
Main Entrance
Women's Health Care, P.C.
Breast Center
Perinatal/Imaging Center
Physician Offices
High Pointe Rehab Services
Tri-State Perinatology
Boston IVF at The Women's Hospital
Women's Health Center

Applied Technology Park and Business Accelerator Along University Parkway

The Initiation of Friendly "Founder Town"

A future vision by the Growth Alliance for Greater Evansville (GAGE) and the University of Southern Indiana (USI) is for Evansville to become a metropolitan center for regional, technology-based business incubation and acceleration, capitalizing on the strengths of the Southwestern Indiana and Northwestern Kentucky economies, with their strong work ethics and manufacturing backgrounds.

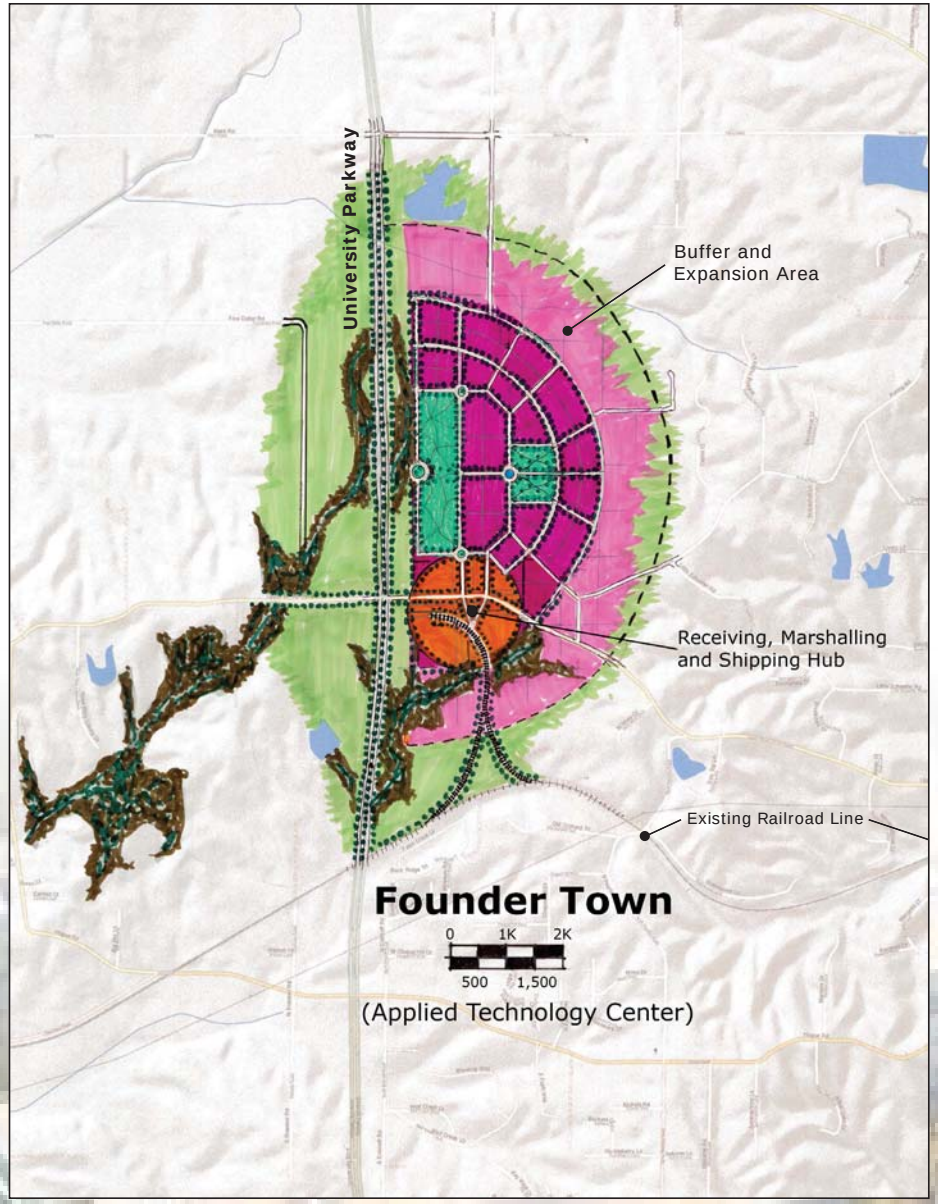
The Partnership Intermediary Agreements (PIAs) between the Naval Service Warfare Center (NSWC) at Crane and the Growth Alliance for Greater Evansville, along with the University of Southern Indiana, provide an opportunity to use federal lab-developed technologies and patents as the basis for technology-based economic development. Intermediaries provide links between entrepreneurs and available resources for scaling up development. A movement has begun to develop an I-69 Innovation Corridor between Evansville and Crane with focused efforts in the areas of brainpower development and retention, establishment of innovation and entrepreneur networks, quality and connected places, civic collaboration, and regional branding. Evansville, as a metropolitan anchor to this new terrain corridor, has the opportunity to become a hub for new tech business incubation and acceleration, a "Founder Town," harkening back to its early heritage of foundries, tool and die shops, and light manufacturing plants.

USI's pilot Technology Commercialization Academy is teaming business and engineering students to develop and test the feasibility of new product commercialization ideas based on Crane patents. This is just one source of innovation that is generating new product, and subsequently new business ideas, as well as expansion opportunities for existing businesses. Through GAGE's operations at Innovation Pointe, the technology business incubator, and various other programs for entrepreneurs, tech business start-up candidates are being identified.

The vision is to use existing assets like Innovation Pointe and USI's Applied Engineering Center, to create new assets that will provide complete incubation and acceleration support services: e.g., co-working spaces for entrepreneurial collaboration, a tech business accelerator with access to rapid prototyping facilities, 3D printing technologies, technical mentor networks to assist with feasibility evaluations, new venture training and development, and connections to venture capital and angel investor sources.

Recent branding surveys polling local and regional residents led to development of an Evansville identity, that of being "Friendly & Successful." Building on this identity, the product design and manufacturing history, and the opportunities presented by the I-69 Innovation Corridor initiative, Evansville could become the "Friendly Founder Town," attracting innovators and entrepreneurs by providing the infrastructure and resources required for successful launching of tech-based businesses.

Figure 6-11: Founder Town



The proposal is to create co-working spaces in Downtown Evansville for technical innovators and entrepreneurs that are linked to the Innovation Pointe incubator, a Certified Technology Park. As ideas are launched, entrepreneurs could move into a business Accelerator to be located in a new West Side Technology Park. The Accelerator could be linked to the USI Applied Engineering Center to provide prototyping, manufacturing feasibility evaluations, and production process design. An Accelerator could assist inventers and investors in bringing their product ideas to market, quickly creating the models and prototypes required to establish feasibility. By perfecting the ability to produce accurate, scaled prototypes using a wide variety of materials, the Tech Park could effectively draw from a national market of inventors and entrepreneurs.

The Accelerator will be the hub of this Technology Park that provides space for the next step in business launch, from accelerator to high-tech production facility. In addition to space for organic growth, the Park would also attract other businesses looking for a community with the resources to help launch and grow tech-based businesses, and for a focused tech-park atmosphere.

Applied Technology Park and Business Accelerator Along University Parkway

The Park could be a focus of development activity located along University Parkway, west of Evansville, Indiana, in Vanderburgh County, in partnership with the University of Southern Indiana's Business and Engineering Schools. The fuel for this "Friendly Founder Town" is conceived as the up-scaling and commercialization of ideas tied to federal lab technology that can be accessed through NSWC Crane.

The southwest Indiana and northwest Kentucky region has also built quite a history of innovation and production in the field of plastics manufacturing and pharmaceuticals research. The world is awaiting further innovation and leadership in other types of **polymers**. With petroleum prices expected to rise, a new plastics resin that is derived from organic material rather than petroleum based sources, could help revolutionize the plastics industry. Friendly "Founder Town" is where the polymer research and innovation could begin. It has been reported that when LCD technology recently met up with flexible polymers, a whole new industry, called "flexible electronics" was born. Apparently, flexible electronics are very thin electronic components that are attached to flexible, elastic, stretchable materials. The thinness and flexibility allows them to be used in lighter portable electronic devices and integrated into clothing and packaging. These developments could ultimately lead to athletic jerseys that monitor vital signs or motorcycle visors that can adjust their tint to bright lights. [2] A university chair of **Natural Polymers**, in the chemistry or engineering department at USI, could be endowed by all of the local plastics companies who would share in the results of the research and innovation that comes out of Founder Town. This region, as the "cradle of the plastics industry," could begin producing solar thin-film technologies for a green economy.

2 "Ohio Gets Strong on Flexible Electronics Entrepreneurs," by Catherine Clifford, in Entrepreneur, December 17, 2012 (www.entrepreneur.com/artice/225296)

The Bristol Myers/Mead Johnson research facilities, as well as the new Indiana University Medical School Southwest, could also play a role in the Tech Park/Applied Technology Center/Founder Town. USI's proposed location of the Indiana University Medical School, in relation to USI, Bristol Myers, and University Parkway, has not been made public at this writing.

RECOMMENDATION: *The Growth Alliance for Greater Evansville, in cooperation with the University of Southern Indiana, working with the Evansville Metropolitan Planning Organization (EMPO) and the Evansville-Vanderburgh County Area Plan Commission, should collaborate in defining the site boundaries and classifying the Applied Technology Park and Business Accelerator an Innovation District and should retain professional planning, design, and legal services to formulate the district as an overlay to the pre-existing zoning. Innovation Districts imply special design requirements and Form-Based Code implications in order to achieve the desired scope, scale and character regarding building siting, parking configuration, landscape features, lighting engineering, and signage standards. The Evansville-Vanderburgh County Area Plan Commission should also take the lead in specifying design and engineering standards for future development along University Parkway. Specifications should include frontage road design, intersection design, grade separation applications, buffer and landscaping standards, signage guidelines, and suggested land uses.*

Henderson Municipal Power and Light (HMPL #1)

An exciting initiative in downtown Henderson, Kentucky is River City Renaissance (RCR). This initiative began in 2010-2011 when local architects, developers, and proactive citizens from Henderson teamed with the University of Kentucky College of Design (UKCoD) to strategize the re-use and revitalization of the old coal-fired power plant, Henderson Municipal Power and Light (HMPL #1). Located prominently on Henderson's riverfront, the industrial plant contains about 65,000 square feet of floor space and has been non-operational for over five years. The UKCoD/RCR effort is significant internationally, having been selected from hundreds of submissions for the prestigious fifth International Architecture Biennale Rotterdam (IABR). The exhibition ran from April through August of 2012. Of the 430 submissions, 29 design projects were ultimately selected. The UKCoD/RCR project was one of only three projects chosen from the United States.

Figure 6-12: Downtown Henderson Convention and Entertainment Zone

Henderson Riverfront Convention Zone

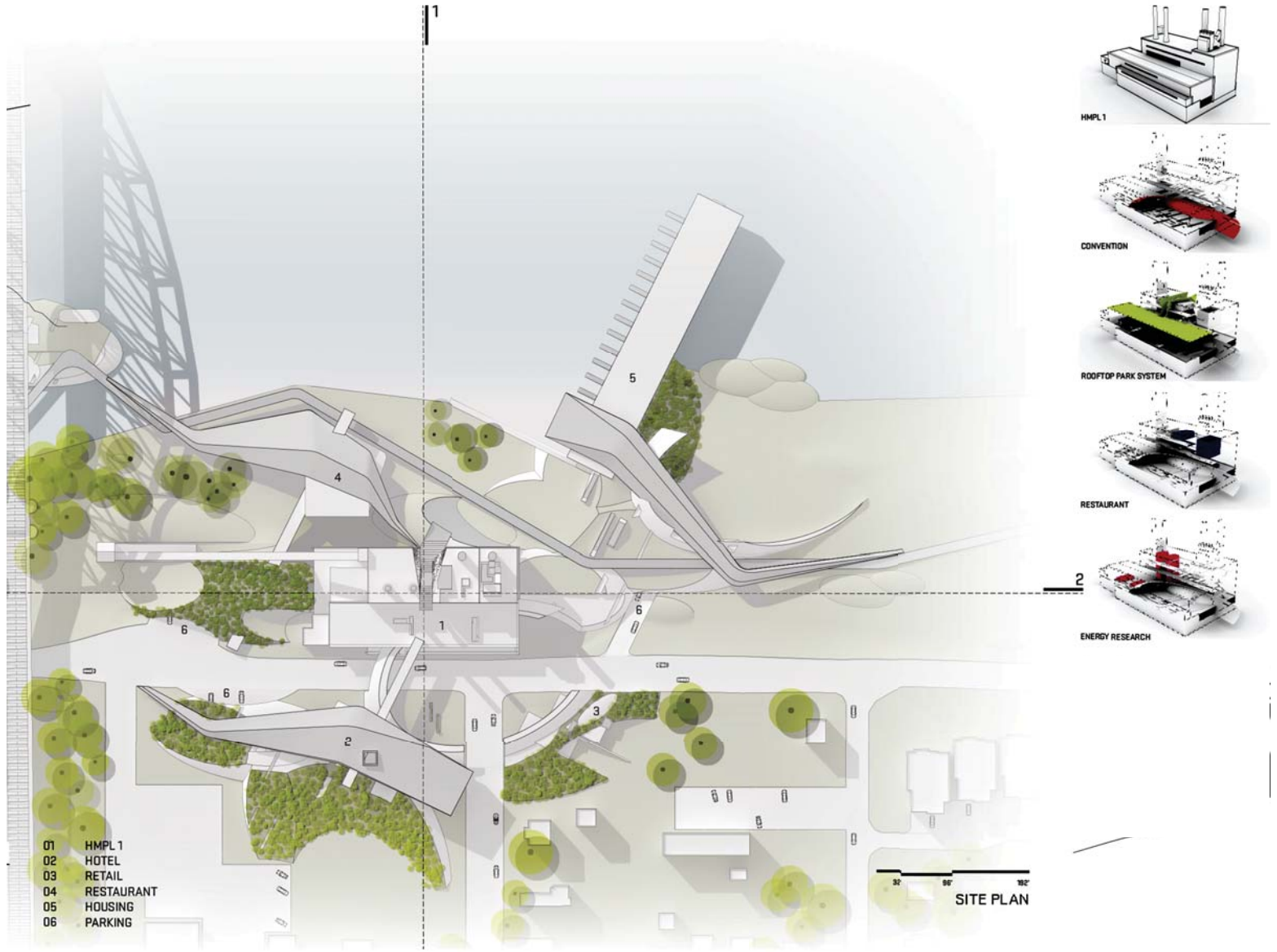
The map on the previous page shows a **Riverfront Convention Zone** in downtown Henderson along the riverfront. With the River Cities Renaissance (RCR) group as its driving force, methods of financing and funding the district are currently being explored. At the heart of the district will be the re-purposed coal-fired power plant, renovated to become a multi-use center. Included in the functions studied by the design team were: a convention center, community meeting space, small hotel, private offices, and historic displays telling the story of the district over time.

The City of Henderson is conducting financial evaluation, at this writing, to determine if it is more economical to demolish the old power plant, mitigate any hazardous materials found in the soils, and offer a clean site for development; or to further delineate a public-private partnership that would renovate and rejuvenate the old coal-fired power plant structure. Whichever method is decided upon, the EPA will be asked to provide Brownfields grant funding, in the manner of the Superfund sites, in the amount of approximately $6 million. Once the determination is made, whether to demolish and mitigate or refurbish, the RCR and the City of Henderson will proceed to explore final funding options for the complete project.

With the properly adjusted incentives and design standards, the Convention and Entertainment Zone should foster a festive, street-active location for more bars, restaurants, nightclubs, entertainment venues, and retail shops. Henderson could become a special location for hosting state and regional conventions, meetings, and symposia for corporations, professional organizations, trade associations, and environmental groups.

Courtesy of Skinner Design Associates, the University of Kentucky College of Design, and the City of Henderson, Kentucky

Courtesy of Skinner Design Associates, the University of Kentucky College of Design, and the City of Henderson, Kentucky

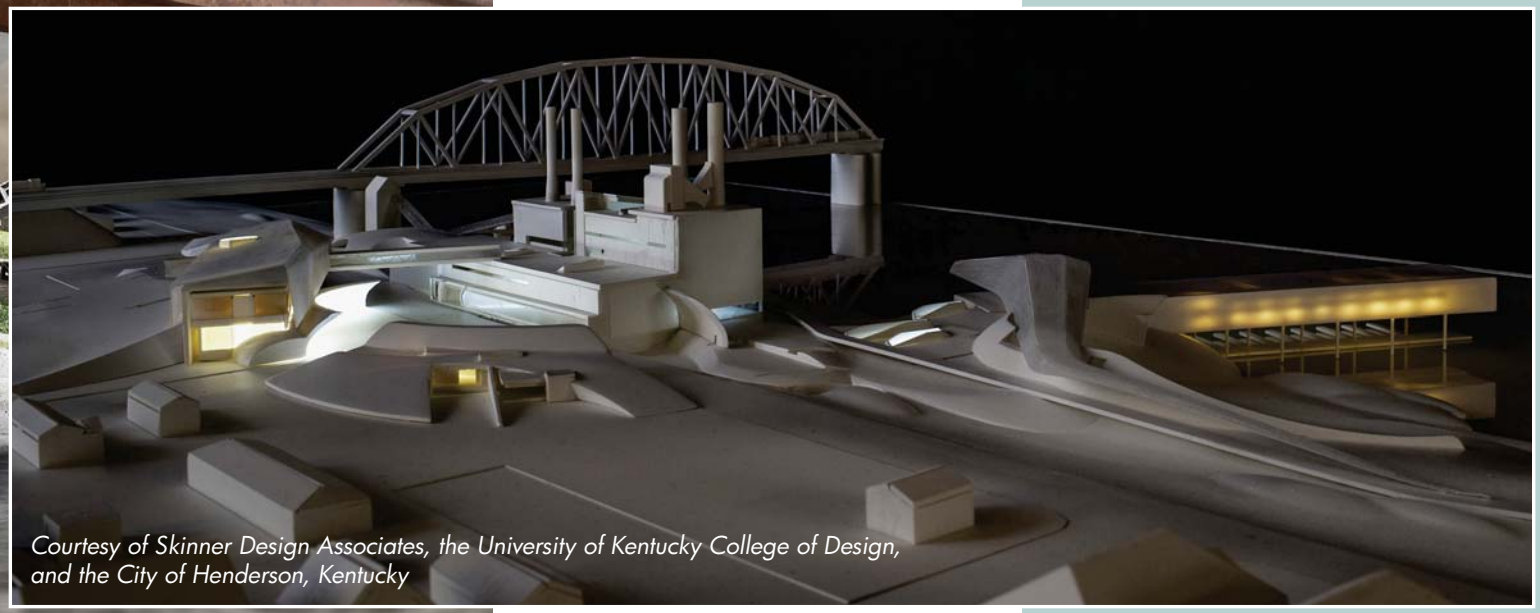


Henderson Riverfront Convention Zone

Courtesy of Skinner Design Associates, the University of Kentucky College of Design, and the City of Henderson, Kentucky

Courtesy of Skinner Design Associates, the University of Kentucky College of Design, and the City of Henderson, Kentucky

RECOMMENDATION: *Once the determination is made, by the City of Henderson, as to the fate of the old coal-fired power plant, Henderson Municipal Power and Light Plant (HMPL #1), a special Riverfront Convention Zone should be implemented in downtown Henderson, on the riverfront. The River City Renaissance (RCR) group and involved local architects should assist the Planning Commission in formulating the district as an overlay to the existing zoning. Innovation Districts imply special design requirements and Form-Based Code implications in order to achieve the desired scope, scale and character of the district with regard to building siting, parking configuration, landscape features, lighting engineering, and signage standards.*



Courtesy of Skinner Design Associates, the University of Kentucky College of Design, and the City of Henderson, Kentucky

Development of "The Wharf"

With funding in place for the new downtown convention hotel and groundbreaking to occur soon, Evansville is moving forward aggressively to improve the quality of life in the downtown area and to attract regional and statewide convention business. Downtown Evansville will also be a formidable choice for siting of the new Indiana University Southwest Medical Campus. The suggested downtown site will have easy access to Deaconess Hospital and the new downtown hotel, as well as to dining and entertainment venues.

The US Army Corps of Engineers has been discussing the possibility of a new port near Evansville's downtown, a so-called "Slackwater Harbor." This port would be located near the present Howell railroad yard and would give strong impetus to the multi-modal commercial trade and freight logistics platform for Evansville and the region. The Corps of Engineers' idea represents the latest concept in innovative transportation and land use planning called cargo-oriented development. This concept integrates freight, economic development, workforce development and environmental programs in pre-existing communities. Evansville serves as the northernmost destination of barge traffic from the Gulf of Mexico for connections to CSX and Norfolk Southern rail lines, providing subsequent overland movement of large containers for both domestic and international trade. CSX Railroad operates its intermodal facility (CSXI) out of the Howell Yard in Evansville. Combining highway, railroad, and commercial river trade traffic makes for wise policy and economic development for the area. Commercial movement by barge is energy and resource-efficient. Using one barge cancels out the tailpipe exhaust from 60 semitrailers or diesel automotive power used to fuel 15 railcars.

Figure 6-13: Truck Route from Howell Yard to Lloyd Expressway

Figure 6-14 shows the approximate location of the new port. Truck traffic from the Howell Yard to the Lloyd Expressway, without rail-crossing interruption, will be critical for effective and efficient multi-modal implementation. (See Figure 6-13.) In addition to the potential for a slackwater harbor near downtown Evansville, the Corps of Engineers may also be looking at the intermodal facilities at the Henderson County Riverport in Henderson, west of Henderson's downtown. This site is situated with relatively close proximity to air freight, rail and truck freight optional cargo modes.

Figure 6-14: Slackwater Harbor

Cargo-oriented Development (COD): Intermodal Freight System and Strategic Hub

Global trends in the manufacturing field and the newest logistics platforms have begun to shift emphasis from "all truck" strategies to an intermodal freight transportation system. As shippers in the public and private sector have set goals for more reliable deliveries, for saving energy and for avoiding congestion and delays, they have begun to look at railroads, waterways, and airports for a big part of the solution. And they have found these assets anchored in the heart of many of our older communities.

Just one gallon of fuel can transport 155 ton-miles by truck, as compared to 413 ton-miles by railroad and up to 576 ton-miles by inland barge. If just 10% of long-distance cargo that is presently being shipped by truck switched to rail, the US would save over one billion gallons of fuel per year. [3]

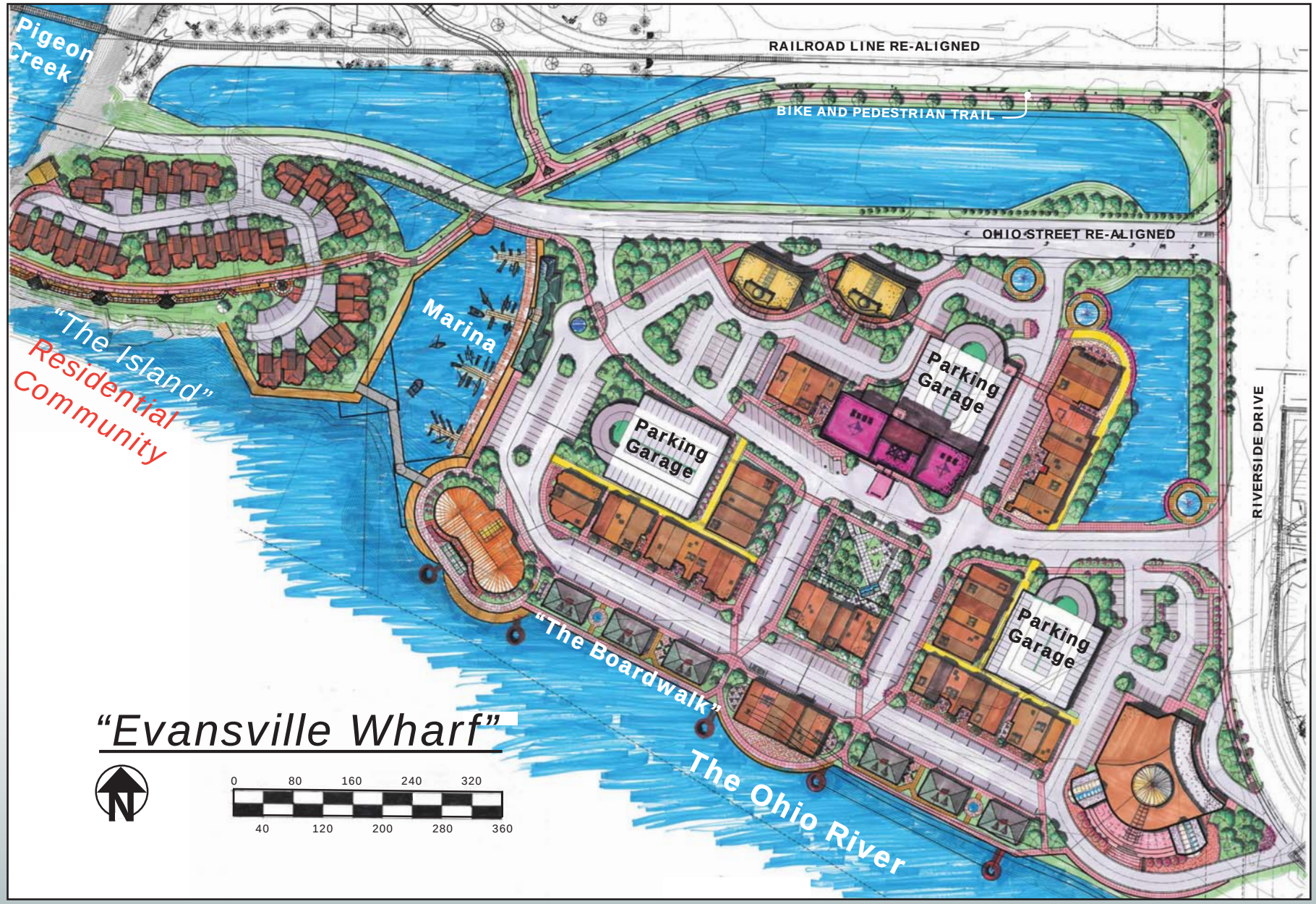
If the Slackwater Harbor is constructed and opened for operation, the prospect of relocating the present sand and gravel yard adjacent to the Tropicana Casino is a real possibility. The port development is much longer-term than the convention hotel (now funded) or the IU Medical School. (At this writing, the downtown Evansville site, to be offered for the Med School, has not been made public.) In a 2040 Regional Plan, it makes sense to publicly discuss the implications of the Corps of Engineers' idea for this new port, being called a "Slackwater Harbor." If the present sand and gravel yard is relocated to the Slackwater Harbor, the land on which it is currently sited would become available for downtown development. In the next couple of decades, with success of the other regional economic development initiatives, downtown Evansville could very well attract enough demand for a mixed use project near Tropicana Evansville that could be regional in scale. The development could be the next iteration of the large shopping mall while also including office, restaurant, entertainment, shopping and residential services. The diagram on the following page (Figure 6-15) shows a concept sketch of the potential for the riverfront area now occupied by the sand and gravel yard. The Ohio River could be sculpted and re-engineered to provide an inner marina for recreational craft as well as residential development. The cost of relocating the sand and gravel operation, acquiring the property, and preparing it for commercial development would not be inexpensive. In the end, a coordinated multi-acre mixed use project might require a national or international developer with the expertise and capital to implement this large-scale undertaking. In order to make the project a reality, discussion and planning will need to begin soon.

Any mixed-use development of the type shown should be constructed using the latest proven sustainable products and materials. Buildings should be designed to take advantage of solar angles and prevailing winds. All public buildings should be LEED Silver certified, at a minimum. Given the location on the bend of the Ohio River, this site could also utilize hydropower for some of its energy needs. The development should feature and showcase net-zero buildings, restorative architecture, renewable energy, and green infrastructure.

RECOMMENDATION: *The City of Evansville and Vanderburgh County should assemble a Port Working Group made up of engineers, developers, public officials, accountants, attorneys, and architects to pursue the possibilities for a new Slackwater Harbor, a direct and unencumbered truck route from the Howell Railroad Yard to the Lloyd Expressway, and approximate cost estimates to prepare the sand and gravel yard for development. The Working Group should file a report outlining its findings and its recommendations for next steps and begin establishing communication with the US Army Corps of Engineers.*

3 *Building Capacity: Helping Communities Create Vibrant, Healthy and Economically Prosperous Neighborhoods* by Reconnecting America and the Center for Neighborhood Technology, see Resources section of the Sustainable Communities Learning Network funded by HUD, DOT and EPA, Complied by Reconnecting America, December 2, 2013

Figure 6-15: The Wharf



The Wharf

Courtesy of VPS Architecture

The Wharf

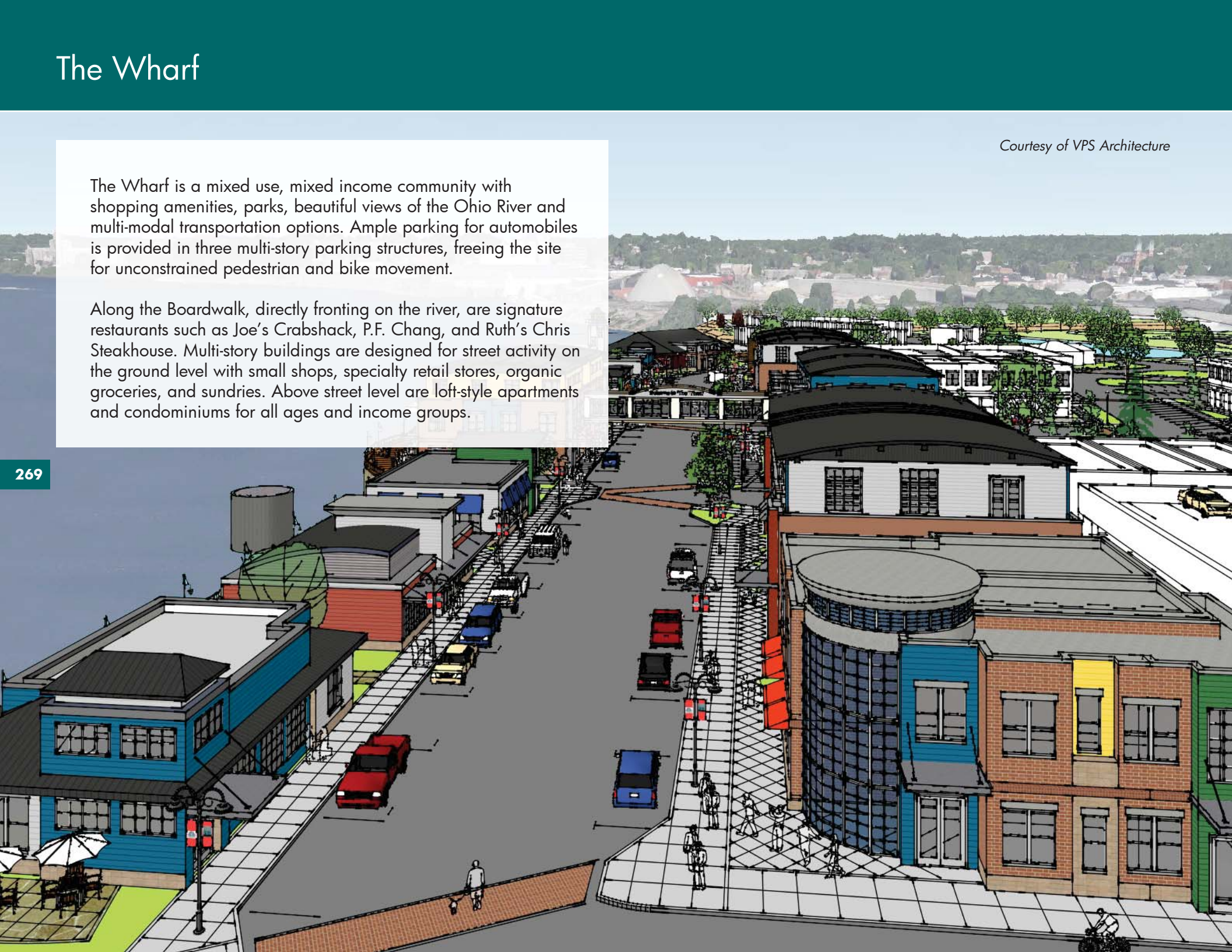
Located on the Bend in the River, at the old sand and gravel yard, The Wharf promises to be a regional wonderland for shopping, touring, sightseeing, hiking, biking, dining, or finding a permanent home. Complete with banquet hall facilities, several small aquariums, a marina for small and mid-sized craft, office space, residences, condominiums, and loft rental apartments, the Wharf is a self-contained, completely new sustainable community. The public is welcome at the Wharf whether they are checking out the retail stores, sampling the delicious restaurant offerings, or just lounging in the park.

The Wharf

Courtesy of VPS Architecture

The Wharf is a mixed use, mixed income community with shopping amenities, parks, beautiful views of the Ohio River and multi-modal transportation options. Ample parking for automobiles is provided in three multi-story parking structures, freeing the site for unconstrained pedestrian and bike movement.

Along the Boardwalk, directly fronting on the river, are signature restaurants such as Joe's Crabshack, P.F. Chang, and Ruth's Chris Steakhouse. Multi-story buildings are designed for street activity on the ground level with small shops, specialty retail stores, organic groceries, and sundries. Above street level are loft-style apartments and condominiums for all ages and income groups.

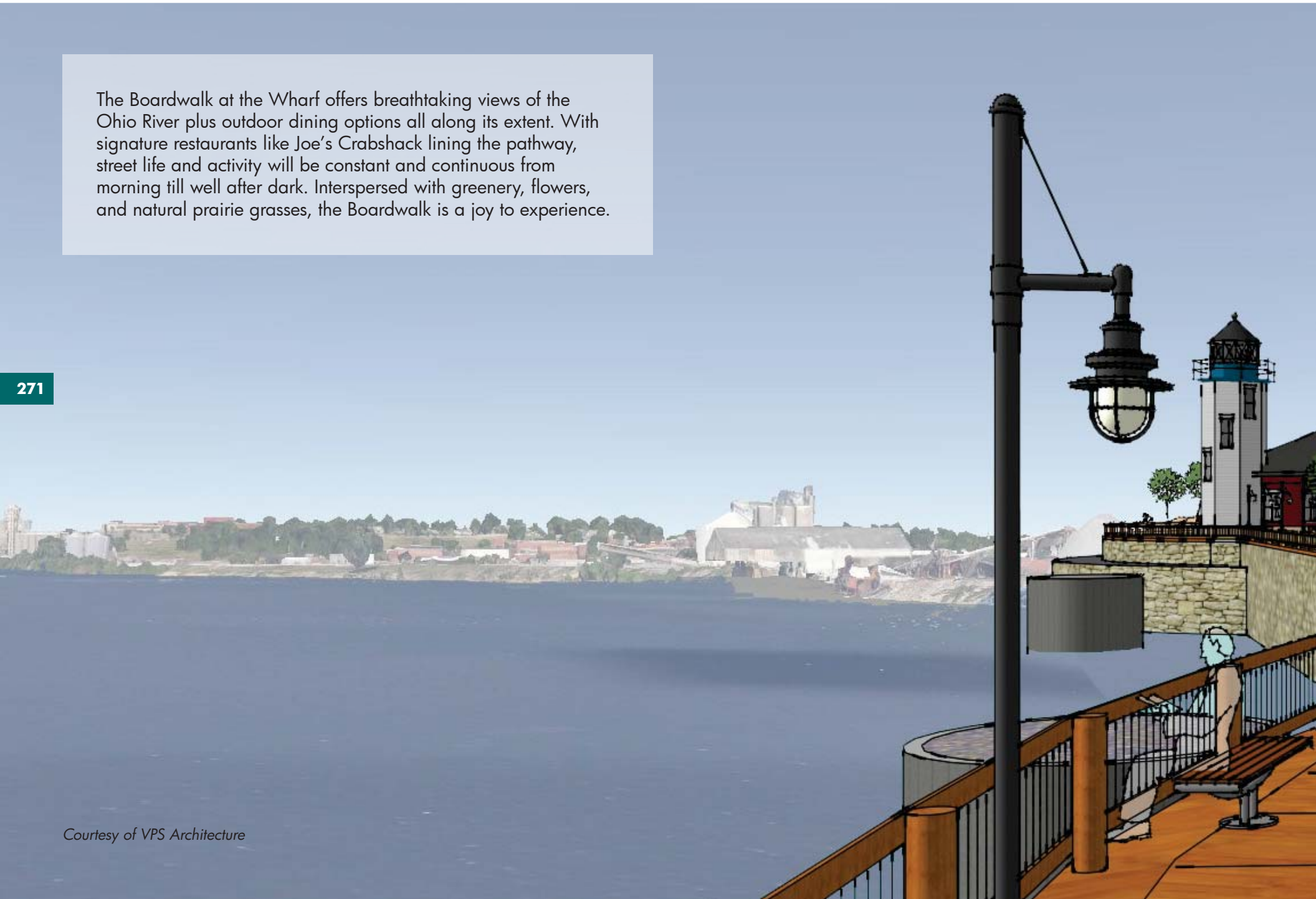


Courtesy of VPS Architecture

At the heart of the Wharf development is an urban park space that is equipped with bandstands, ice skating rinks, plaza seating space, a water spray park, and lush landscaping. All spaces inside the Wharf are outfitted for sustainability, including water reclamation; recycling bins and collection services; natural, low maintenance flower and tree species; as well as hydroelectric and solar power. High-tech building materials with high-recycle content, high reflectivity, and easy maintenance combined with high durability are used throughout the development.

The Wharf

The Boardwalk at the Wharf offers breathtaking views of the Ohio River plus outdoor dining options all along its extent. With signature restaurants like Joe's Crabshack lining the pathway, street life and activity will be constant and continuous from morning till well after dark. Interspersed with greenery, flowers, and natural prairie grasses, the Boardwalk is a joy to experience.



Courtesy of VPS Architecture

The Wharf

Pedestrian overpasses at the second level above the streets make walking from destination to destination, in inclement weather, an easy jaunt. Graphics, signage, pavements, building materials, are all orchestrated to contribute to a satisfying whole composition. Man-made features, all designed to complement one another, when added onto a stellar natural landscaping program, make for a unified development, one unlike anywhere in the Tri-State.

Courtesy of VPS Architecture

The Wharf is designed as an extension of downtown Evansville. Its activities are meant to complete Evansville, not compete with the retail and cultural amenities already located there. Relying on the synergies of co-location and market "tipping points," the Wharf has been conceived as the perfect finish to an already spectacular downtown. The activities at the Wharf will complement the Tropicana experience, the Evansville museums, the Main Street shops, and the downtown government and professional office environment.

Courtesy of VPS Architecture

Regional Food Hubs in Henderson and Vanderburgh Counties

The working definition of a Food Hub can be stated as follows:

> *"A food hub is a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/ regionally produced food products."* [4]

The role of Food Hubs in marketing locally grown produce, meat, and poultry products is detailed in a report published in January of 2013 called "The Role of Food Hubs in Local Food Marketing." The report by the US Department of Agriculture (USDA) documents the rapid expansion of food hubs nationally, and their role in the economic challenges and opportunities in local food markets nationwide. There are well over 200 food hubs now operating in the United States. These hubs are part of a distribution network designed to move locally produced food into mainstream markets by supplying chains for goods to be moved from the farm to the table. In releasing the report, Agriculture Deputy Secretary Kathleen Merrigan said:

> *"At USDA we are committed to food hubs because we believe that they offer strong and sound infrastructure support to producers across the country which will also help build stronger regional food systems."*

4 USDA Agricultural Marketing Service by Errol Bragg, Division Director, and Jim Barham, Agricultural Economist, "Know Your Farmer/Know Your Food" [KYF2] Regional Food Hub Subcommittee, www.usda.gov/knowyourfarmer

The USDA has mounted an outreach campaign targeting viable locations that may be able to utilize USDA programs and resource guides. The agency is also developing a prioritized list of USDA funding streams that will be able to be used to target regional food hub development. Potential benefits of regional food hubs are:

1. Expanded market opportunities for farmers and dairymen;
2. Job creation in both urban and rural areas; and
3. Increased access to fresh healthy foods for local consumers, with great potential to reach underserved areas and food deserts.

The closest sites of existing wholesale terminal produce markets having potential to become major food hubs are in St. Louis and Louisville. The Evansville metropolitan area is ideally situated between these hubs and should explore organization and funding for two food hub sites: An urban food hub in the East End Neighborhood of Henderson, Kentucky; and a rural food hub in northern Vanderburgh County, Indiana. The Henderson facility will begin to organize markets in Western Kentucky and the Vanderburgh County facility will begin to organize markets in Southern Indiana. When the two facilities are stable and operating sustainably, they can then begin to share inventory, fill orders and operate in both states, as well as within Southern Illinois.

The Core Components of Food Hubs are:

Aggregation/Distribution-Wholesale

- Become the key location/hub for creating large, consistent and reliable supplies of locally produced foods from small to mid-sized farms within the region.
- Become the main drop off point for multiple farmers and a key pick up point for distribution companies and clients who want to purchase source-verified local and regional food.

Active Coordination

- Offer business management systems and a management team that can actively coordinate supply chain logistics, including seeking markets for producers, and coordinating efforts with distributors and buyers.
- Overall hub management oversight of the local food supply coming in and going out, in order to maintain an adequate supply of locally produced products.

Permanent Facilities

- Provide the space and equipment for food to be stored, lightly processed, packaged, palletized and pre-sold, in some cases, under a Hub regional label, but maintaining the local farm identity.
- Serve as the primary terminus for wholesale vending and some retailing of regional foods. [3]

3 *Building Capacity: Helping Communities Create Vibrant, Healthy and Economically Prosperous Neighborhoods* by Reconnecting America and the Center for Neighborhood Technology, see Resources section of the Sustainable Communities Learning Network funded by HUD, DOT and EPA, Complied by Reconnecting America, December 2, 2013

Regional Food Hubs in Henderson and Vanderburgh Counties

A Community Development Financial Institution Fund (CDFI Fund) is expanding access to healthy food throughout America in low-income communities. The U.S. Department of the Treasury, the U.S. Department of Agriculture and the U.S. Department of Health and Human Services are collaborating to provide funding and/or capacity development to organizations that invest in businesses that provide healthy food options in low-income neighborhoods. Businesses eligible for CDFI Funding include grocery stores, farmers markets, bodegas, food co-ops, food hubs, and urban farms. The most important factor in the funding determination is that businesses and organizations being funded are often the single source of fresh produce or organic products for an entire neighborhood, and become a vital community resource. The list of awardees can be viewed at www.cdfifund.gov/awards.

Figure 6-16: Henderson East End Potential Food Hub

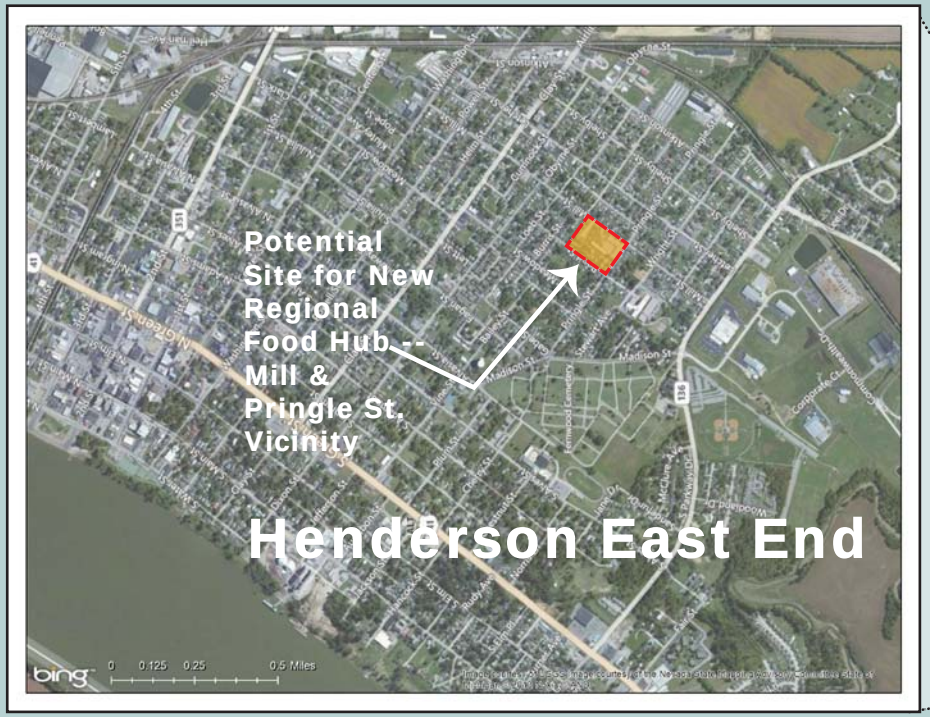


Figure 6-17: Regional Food Hubs

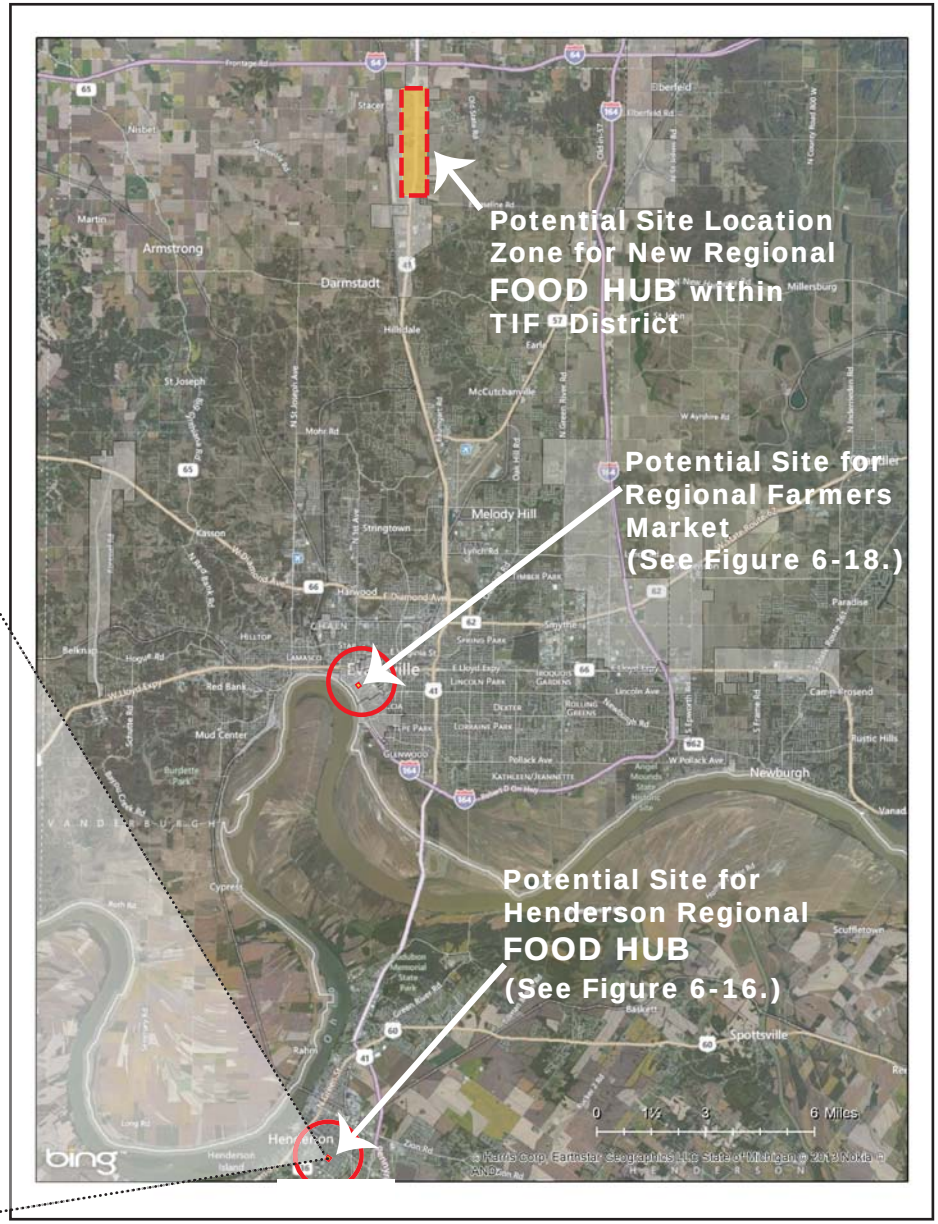


Figure 6-18: Evansville Potential Regional Farmers Market and Food Retail Outlet at Old Greyhound Station

Courtesy of RATIO Architects and the Department of Metropolitan Development of Evansville, Indiana

RECOMMENDATION: *The City of Henderson, Kentucky, through the new East End Development Corporation, should collaborate to form an urban Regional Food Hub in the East End of Henderson. Vanderburgh County, in cooperation with the Welborn Baptist Foundation, should collaborate to form a rural Regional Food Hub in northern Vanderburgh County on north Highway 41. Once these new Food Hubs are well-established, they should form a Food Cooperative with membership throughout western Kentucky and southern Indiana, in order to capitalize on economies of scale. An on-line tool allowing farmers to swiftly identify potential buyers will be a must. The software should be reasonably priced and easy to use.*

Industrial Legacy Districts

In both the City of Evansville and the City of Henderson, there are urban areas that, in their heyday, housed viable manufacturing companies, foundries, tool and die shops, assembly plants, and a variety of other industrial concerns. These companies kept the respective economies of their home cities humming along after World War II, and many were thriving as late as the mid-1970's. Today there remain signs of this manufacturing legacy in many of the brick buildings that have become warehousing and shipping facilities or have fallen into disrepair and become vacant. Some businesses have evolved into viable light industries, fabrication firms, or welding shops. Companies such as Evansville Sheet Metal have leveraged digital technologies and computer capabilities to become high-tech, precision practitioners. In Evansville Sheet Metal's case, the company can cut and shape steel into sheet metal stock or precision-machined metal parts using patterns and templates in computerized programming.

There is a growing movement espousing the slogan, "Made in Evansville, USA." Renewed interest in local manufacturing has been spurred by rising wages in China and the strength of the yuan, rising global costs for fuel, increasingly customized production, and "just-in-time" delivery of goods. Few Hoosiers realize that our nation is still the top manufacturing nation in the world, if you measure by productivity and GDP, according to JPMorgan's Global Manufacturing Purchasing Managers Index. Here in the three county region, a local campaign is needed to change the perception that manufacturing is a dull, boring, unsophisticated pursuit with poor wages. On the contrary, skilled manufacturing involves technology and digital literacy that can be acquired at the local EVSC Career and Technical Center or at Ivy Tech in both two-year and four-year programs. Skilled manufacturing workers earn about $60,000 on a national average basis.

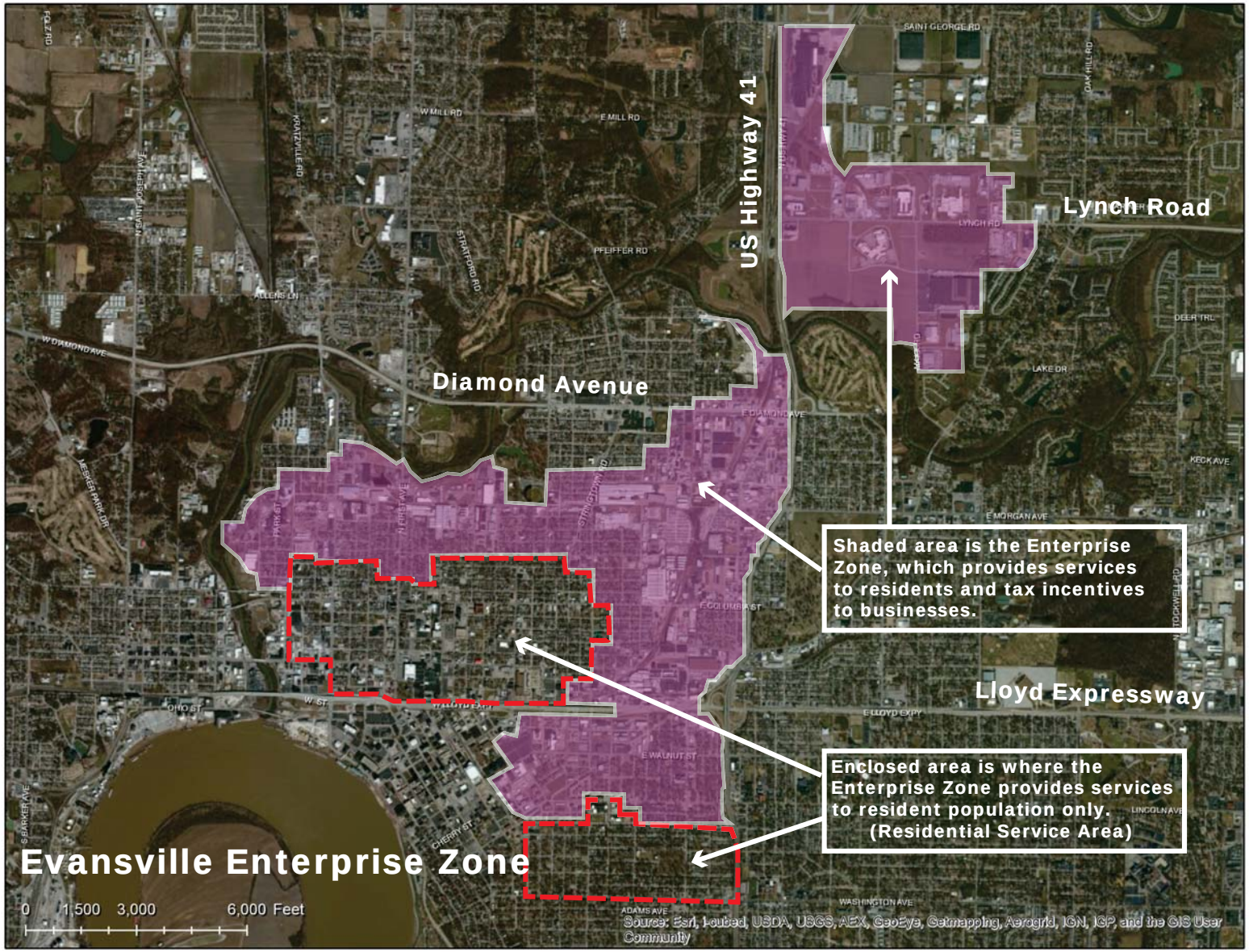
What is needed in our metro area, in order to grow local manufacturing enterprises into profitable, job-generating companies is supportive land-supply policies. Industrial legacy areas should be unconstrained by outmoded zoning laws that do not allow mixed use office, factory combinations and/or live-and-work studios. Flexible land use policies and zoning overlay districts can help create opportunities for the exploration of creative manufacturing arts, technical trades, and apprenticeship programs for young adults interested in manufacturing. The need for industrial land protection is critical and, where mixed use constructs are allowed, will encourage alliances between the creative "maker entrepreneurism" and more "scaled-up" industrial production interests. [5]

The Evansville Urban Enterprise Zone, shown in Figure 6-19, was initiated in 1984 and since that time, has engaged over 150 participating Evansville businesses. The Enterprise Zone should continue to be targeted for new craft and boutique businesses, making it an innovation hub and source of good-paying jobs. In 2006, the State of Indiana made a capital investment tax deduction available to qualifying businesses and the businesses in the Urban Enterprise Zone became eligible for this deduction. Qualifying capital investments in facilities include the following:

- **Purchase or Construction** of a primary building
- **Purchase** of new manufacturing or production equipment
- **Costs for Repairs, Rehab, or Modernization** of an existing building along with any related improvements
- **Infrastructure Improvements** on site
- **Cost for Retooling** of existing machinery.

5 "Manufacturing is Alive and Well in the U.S." by JoAnn Greco, in Planning Magazine, the Magazine of the American Planning Association, 205 N. Michigan Ave. Suite 1200, Chicago, IL 60601, Volume 80, Number 2, February 2014

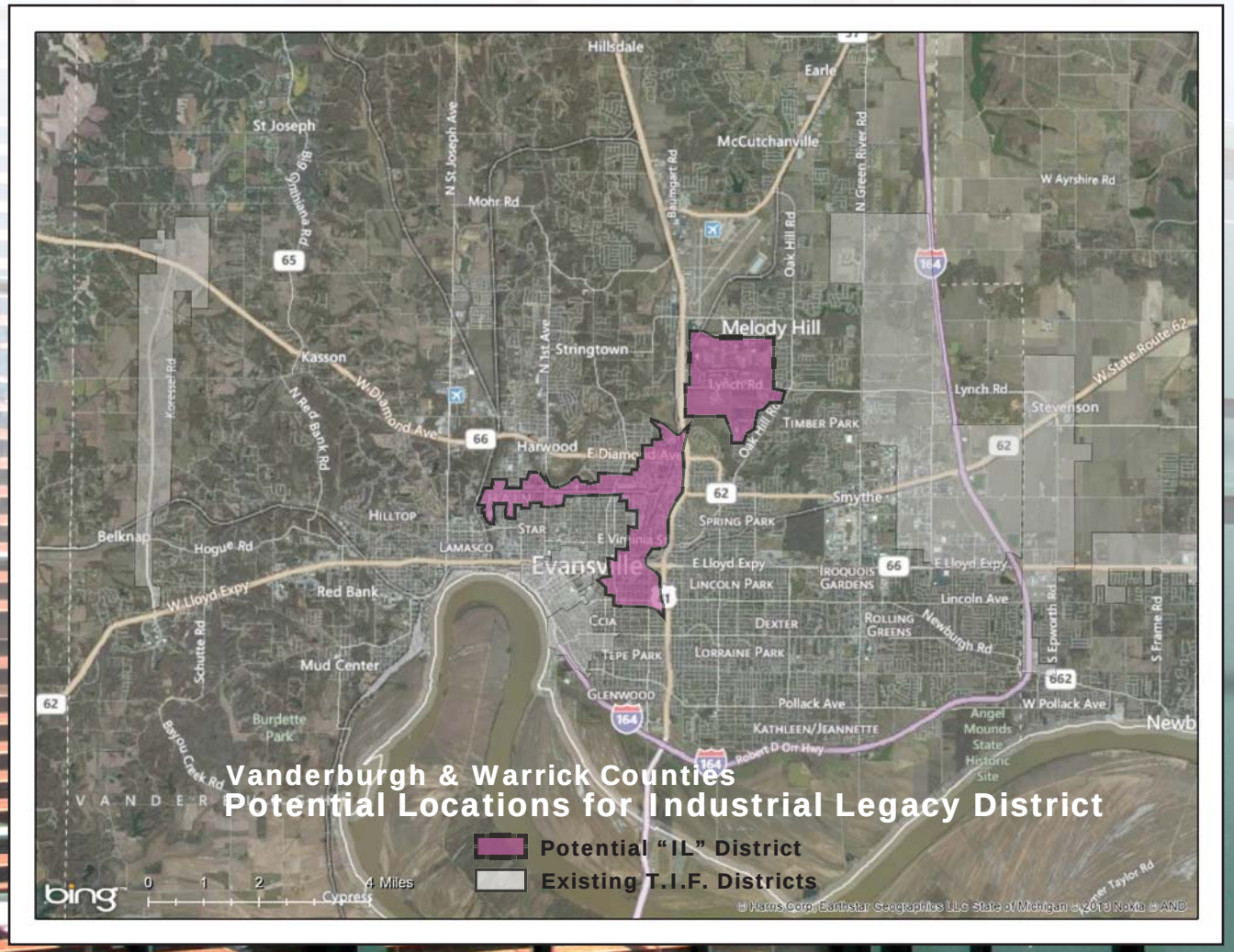
Figure 6-19: Evansville Enterprise Zone



Industrial Legacy Districts in Evansville

Also in 2006, the City of Evansville created the Center City Industrial Park and designated it as a Tax Increment Financing district. Figure 6-20 shows the location of the Center City Industrial Park (CCIP TIF) in Evansville and suggested designation of an Industrial Legacy TIF District along Highway 41, also in Evansville. See Chapter 7 for zoning overlay district recommendations that create an "IL" overlay design district. The overlay design district will utilize a form-based land use code approach, in order to customize designs inside the TIF districts and the Urban Enterprise Zone.

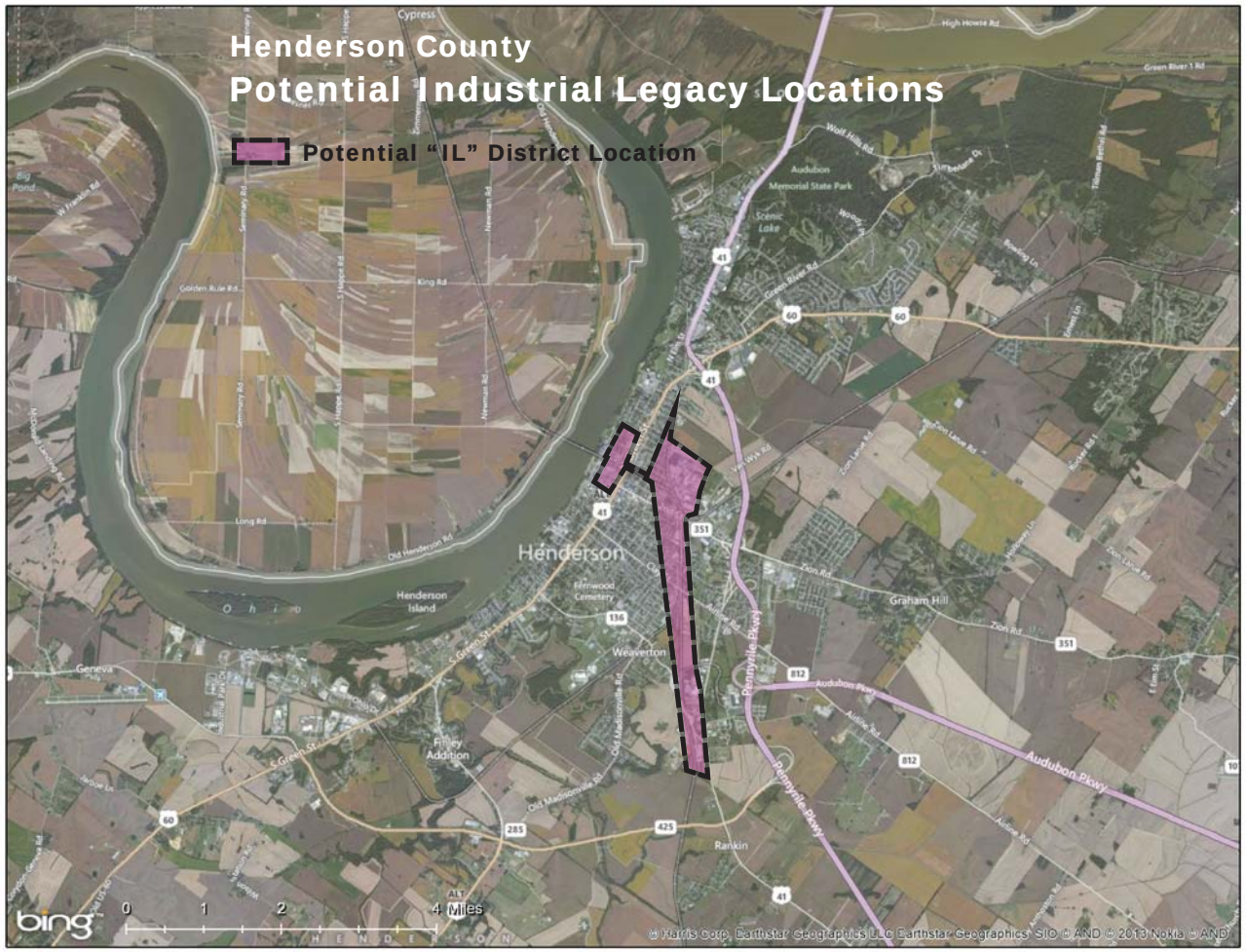
Figure 6-20: Industrial Legacy Evansville



Industrial Legacy Districts in Henderson

Figure 6-21 shows industrial legacy areas within the Henderson, Kentucky city limits. The Planning Commission in Henderson should take a look at creating an "IL" Industrial Legacy overlay district, with incentives for re-tooling older factory structures and warehouses into new uses.

Figure 6-21: Industrial Legacy Henderson



Village Earth: A Sustainable New Community

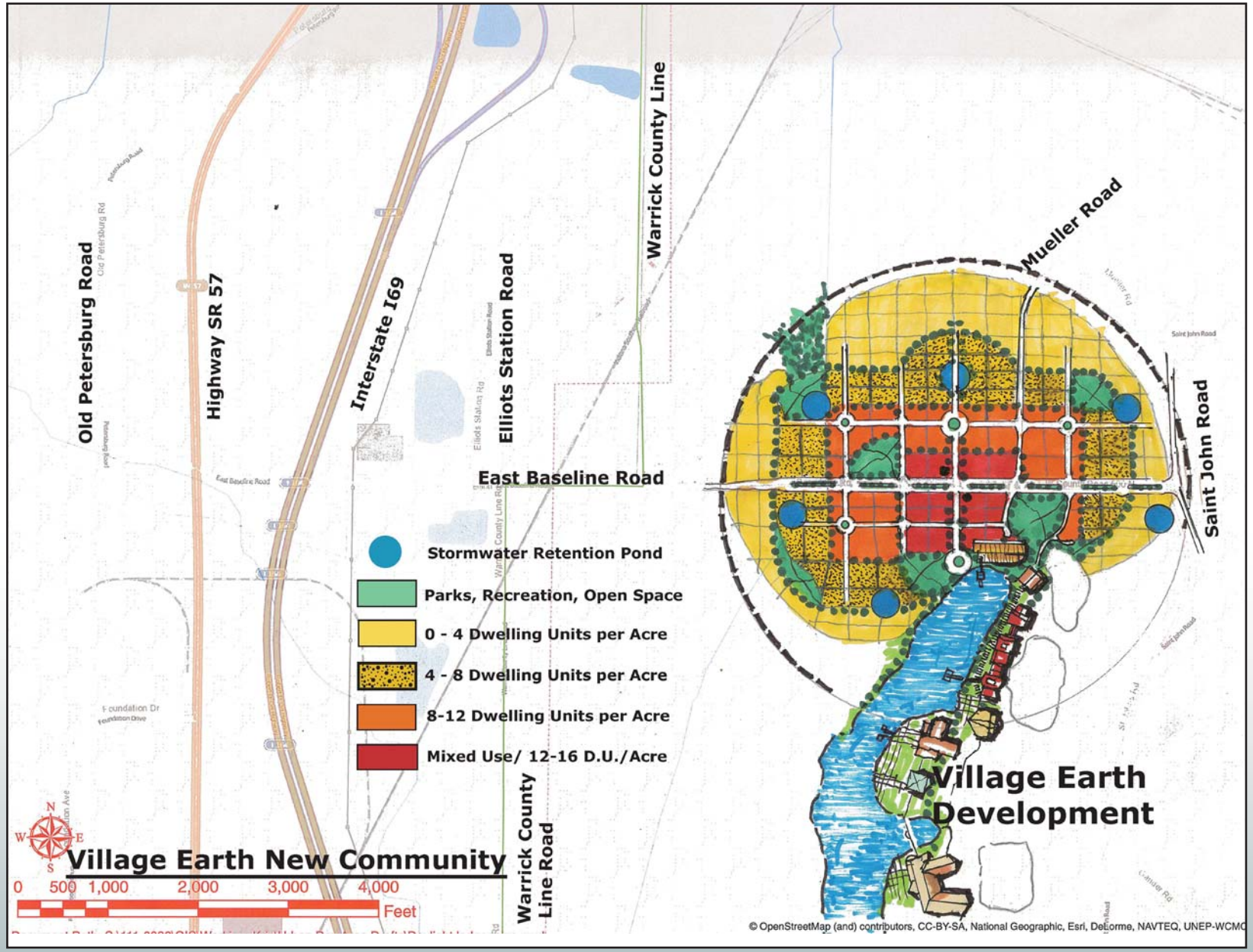
A very exciting sustainable development in Warrick County, originally unveiled in late 2009, is the Village Earth project. Envisioned to be built on reclaimed land that was previously strip-mined for coal deposits, the development is being proposed by the Hoosier Heritage Youth Foundation, Stonegate Development Partners, International Facilities Group, LLC, and Brownfield Management Associates, LLC. Developers intend to partner with higher education institutions, and with the Indiana Department of Natural Resources and the federal Environmental Protection Agency. The description below is taken directly from the **Village Earth Information Packet** dated November 12, 2009. Developers are in the process of completing their initial financing arrangement and detailed design engineering.

"The Village Earth Complex will involve the creation of a new public institution that will provide regional, national, and international tourists with educational and recreational opportunities. Visitors will be offered the chance to fully experience and better understand the natural world around them. The development is also touted to create a major economic stimulus for Southwestern Indiana by, according to its authors, drawing at least 700,000 visitors annually. Village Earth promises to be a significant addition to Indiana's dedication to advancing environmental awareness within the state, while providing visitors of all ages valuable insights as to how we can all live more sustainably in a world where the sources of non-renewable energy are under great pressure."

Figure 6-22: Village Earth Concept

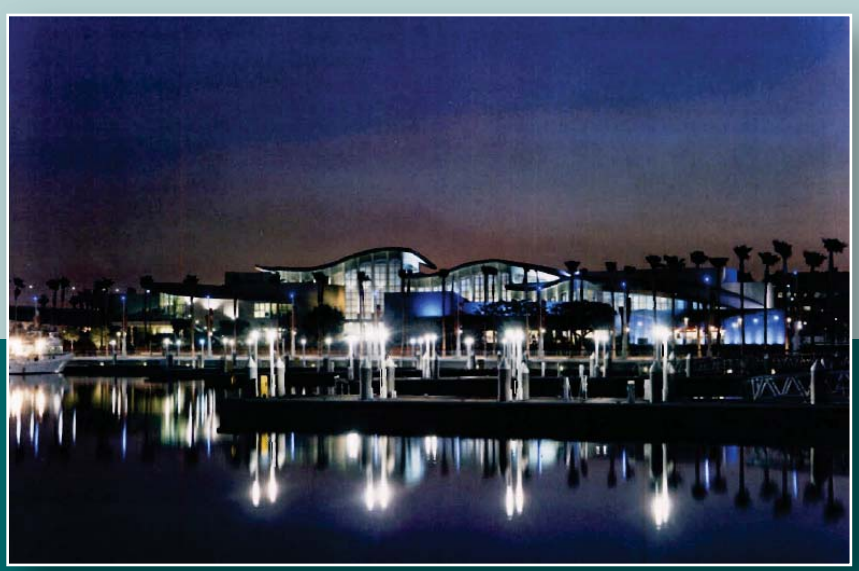
Courtesy of Stonegate Development Partners, LLC and International Facilities Group, LLC

Figure 6-23: Village Earth Node

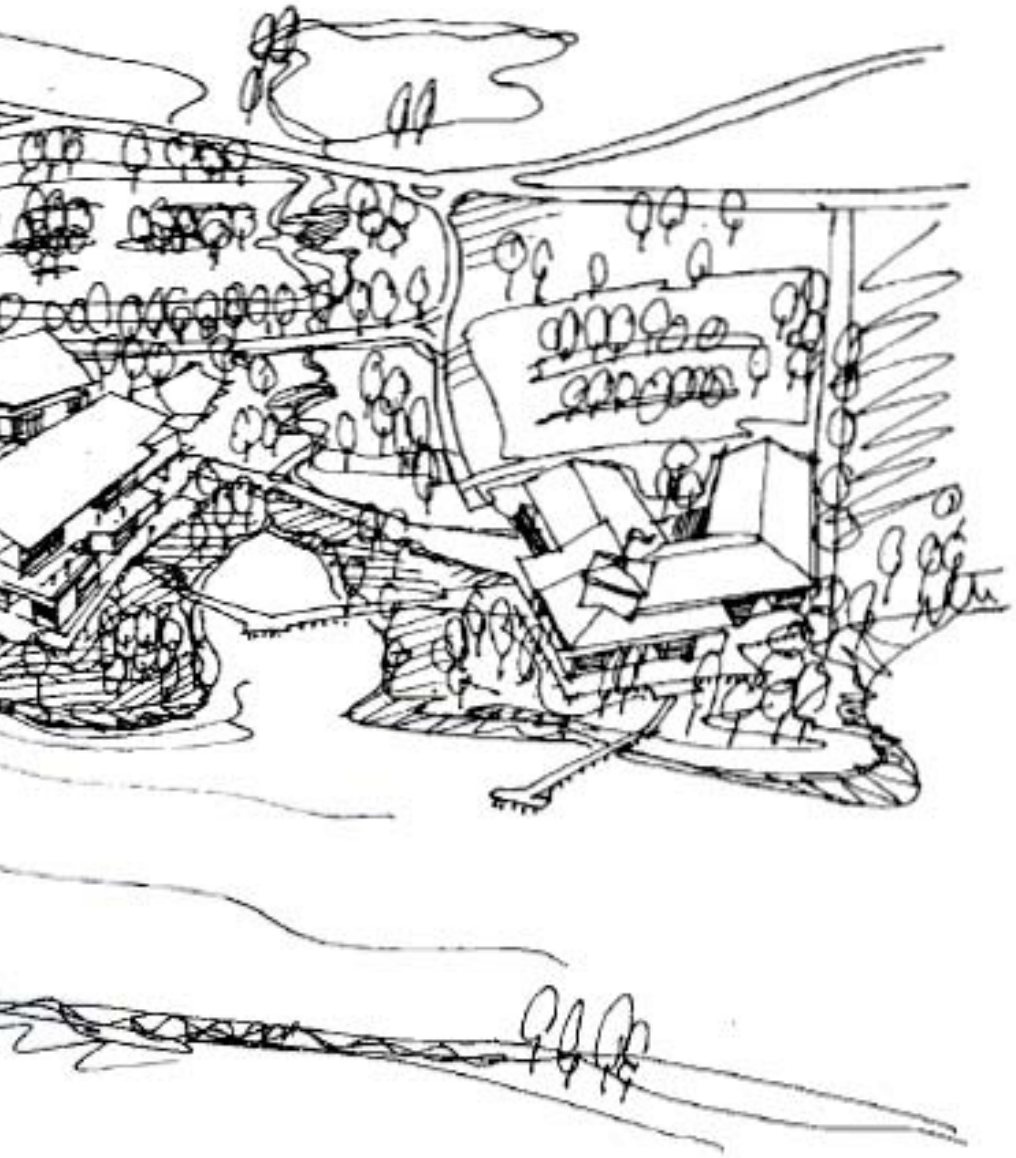


Village Earth: A Sustainable New Community

There will be several key components of the Village, including the Natural History Interpretive Center, the Aquarium of the Midwest, and the Center for Sustainable Living. In addition, all development, including site and architectural work, will emphasize scale and use of materials appropriate to the site and region. The overall composition will be a series of structures that complement each other while being closely tied into the site and the local physical terrain. The goal will be to promote a highly effective utilization of energy, water, transportation and materials, and to seek to eliminate the concept of waste at all scales. The developers hope to orchestrate a model response to the challenges of climate change, carbon emission reduction and resource recovery. The project will exemplify, along with the Boonville wetlands, a prime exhibit of how former open "pit mines" can be re-constructed to become useful space that makes a contribution to the local environment and culture.



Courtesy of Stonegate Development Partners, LLC and International Facilities Group, LLC



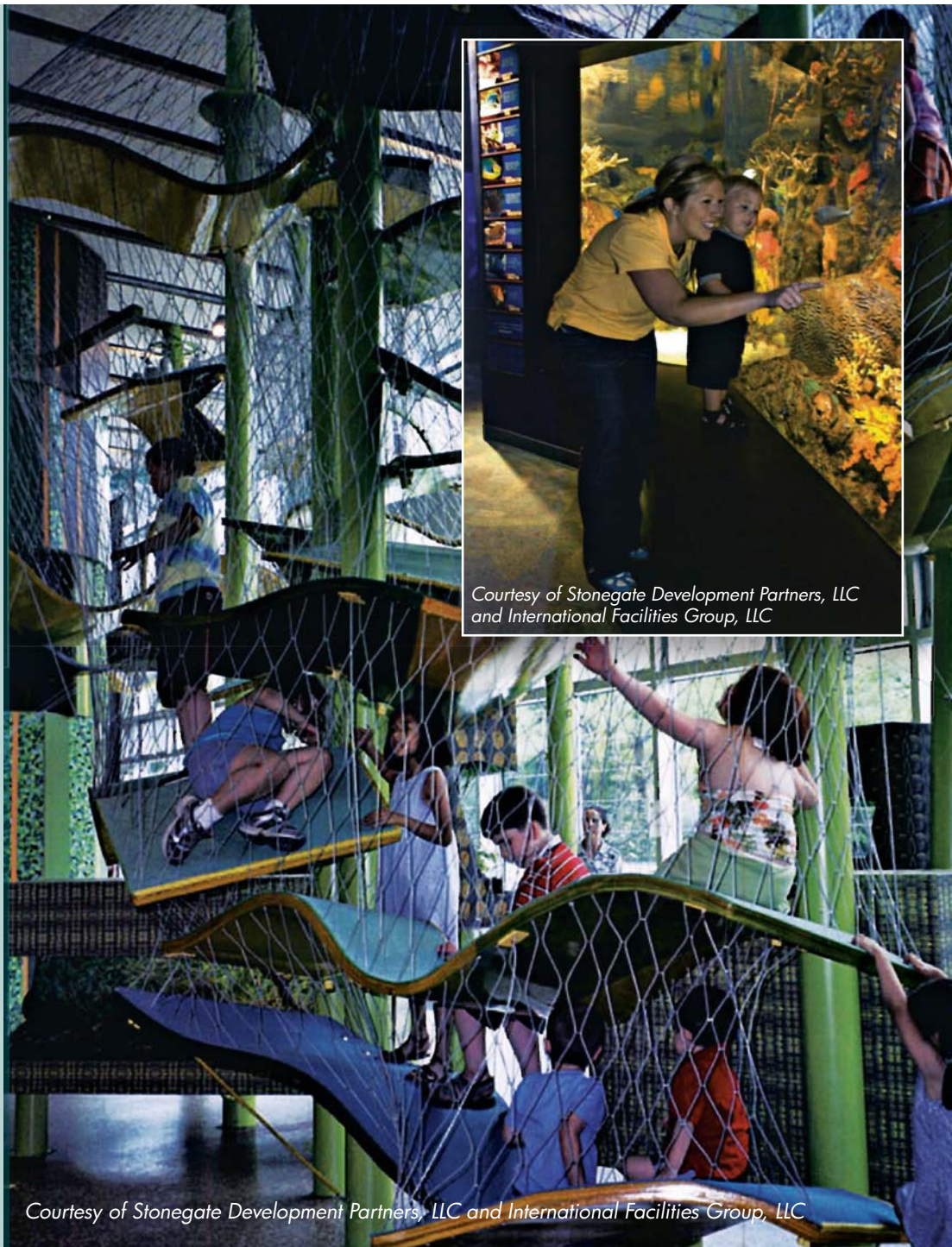
Courtesy of Stonegate Development Partners, LLC and International Facilities Group, LLC

According to the developers, Village Earth anticipates annual generation of $5 to $10 million from environmentally-oriented incentives and other partnering opportunities including the following:

- Leveraging and coordinating Supplemental Environmental Projects (SEPs) by regulated industry to support the Project;
- Designing and implementing an algae farm Carbon Sequestration Offset Project to create and monetize carbon offset credits (through membership in the Chicago Climate Exchange or over the counter trading with industry);
- Developing and marketing Biofuel Feedstock in connection with the Carbon Sequestration Offset Project mentioned above;
- Identifying and monetizing Ecosystem Services Credits for the restoration and/or enhancement of natural resource features (wetlands, streams, habitats) on the Project site;
- Identifying and obtaining Renewable Energy and Energy Efficiency Credits from government or other sources in connection with the sustainable design of the Project;
- Facilitating access to Federal Brownfield Grants or Loans to help cover costs of environmental remediation for the former strip-mined property on which the Project will be located;
- Pursuing other potential funding sources, including funding for renewable energy business creation and potential charitable giving from private industry.

Village Earth: A Sustainable New Community

The accompanying photos illustrate the concept for Village Earth itself and for the Sustainable Community that will grow up around it. It is anticipated that commercial and residential spin-off development near the Village Earth site will be incentivized to utilize green, sustainable design and construction practices, along with Neo-Traditional Planning principles that conserve land and resources. It is felt that high-performance, sustainable building design will add considerably to the initial and resale value of any and all buildings, both inside Village Earth or on the periphery. Private buildings near the Village Earth site will be designed for photovoltaic installation with an eye to net zero-energy performance. Net zero-energy simply means that the buildings create their own energy and, while they may be connected to the grid, will only use municipal power and light in unusual circumstances such as when there has been a lack of direct sunlight for several days or weeks. If one examines a net zero energy building's fuel and utility costs over a 12-month period, the net use of municipal services should amount to either zero or a negative number (signifying a net contribution of energy to the grid, rather than a net consumed amount). When complete, the Village Earth Community will be an energy-independent community that restores rather than destroys the natural world and its creatures.



Courtesy of Stonegate Development Partners, LLC and International Facilities Group, LLC

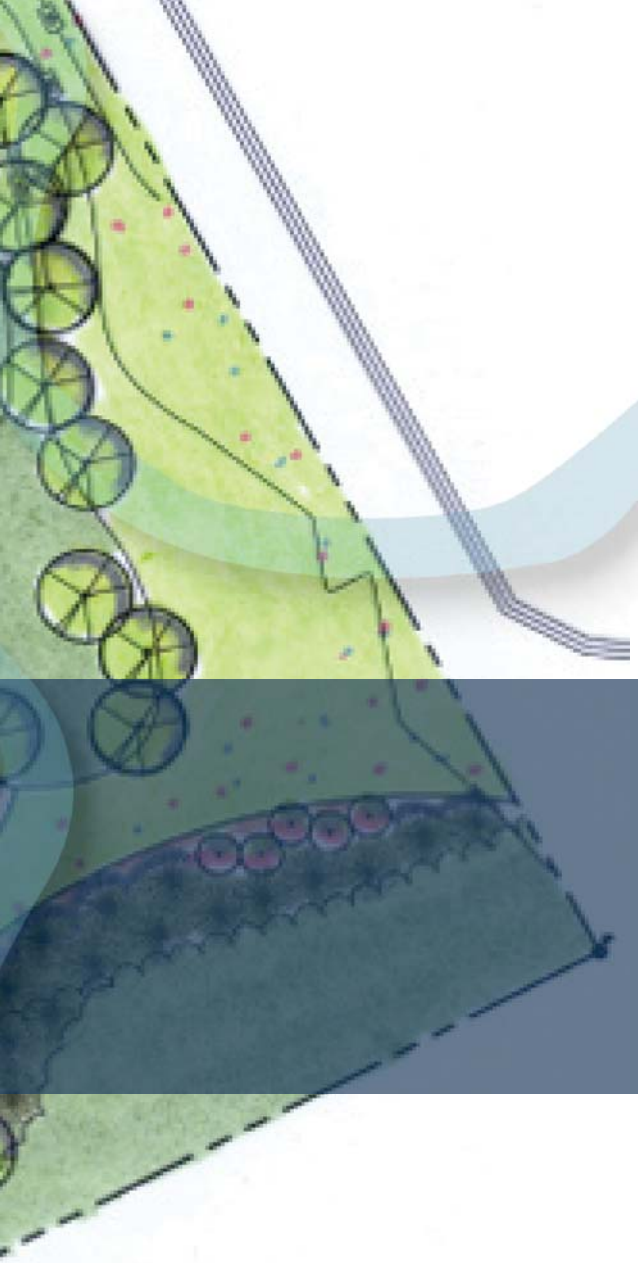
Courtesy of Stonegate Development Partners, LLC and International Facilities Group, LLC

Courtesy of Stonegate Development Partners, LLC and International Facilities Group, LLC

Courtesy of Stonegate Development Partners, LLC and International Facilities Group, LLC

RECOMMENDATION: *The Warrick County Commissioners should collaborate with the development team for Village Earth by offering development incentives and assistance with grant applications to state and federal agencies. The Commissioners should also examine the county's tax structure and bonding capacity to determine the level of financial involvement Warrick County can muster, in order to move this key economic development project forward.*

Courtesy of VPS Architecture



Chapter 7: Millennial Implementation Tools & Guidelines

"Cities have to move to a new system. They should look at the streets they like and the public spaces they like and then write the rules to get more of what they like and less of what they don't. Conventional zoning doesn't do that. It just gives a use and a density and then you hope for the best."

- Peter Katz

Background

The surest way to implement the vision, objectives, themes, concepts, and recommendations of this Regional Plan is to modernize the codes, regulations and ordinances that govern in its three counties. From building codes to land use regulations, these ordinances and their state enabling legislation are, in many cases, decades old. More concerning than the age of these laws is the fact that, in some cases, the laws are actually hindering the creativity and innovation required of today's developers who are trying to satisfy the preferences of the citizens in their target market areas. In this chapter, an effort will be made to draw attention to some of the most pressing problems associated with local regulations and some prescriptions for their potential solutions. It is not the intention of this chapter to specifically re-write statutes and ordinances. The intent is to chart a clear path to more modern and responsive land use regulations and building codes for appropriate housing densities and more efficient use of natural and man-made resources.

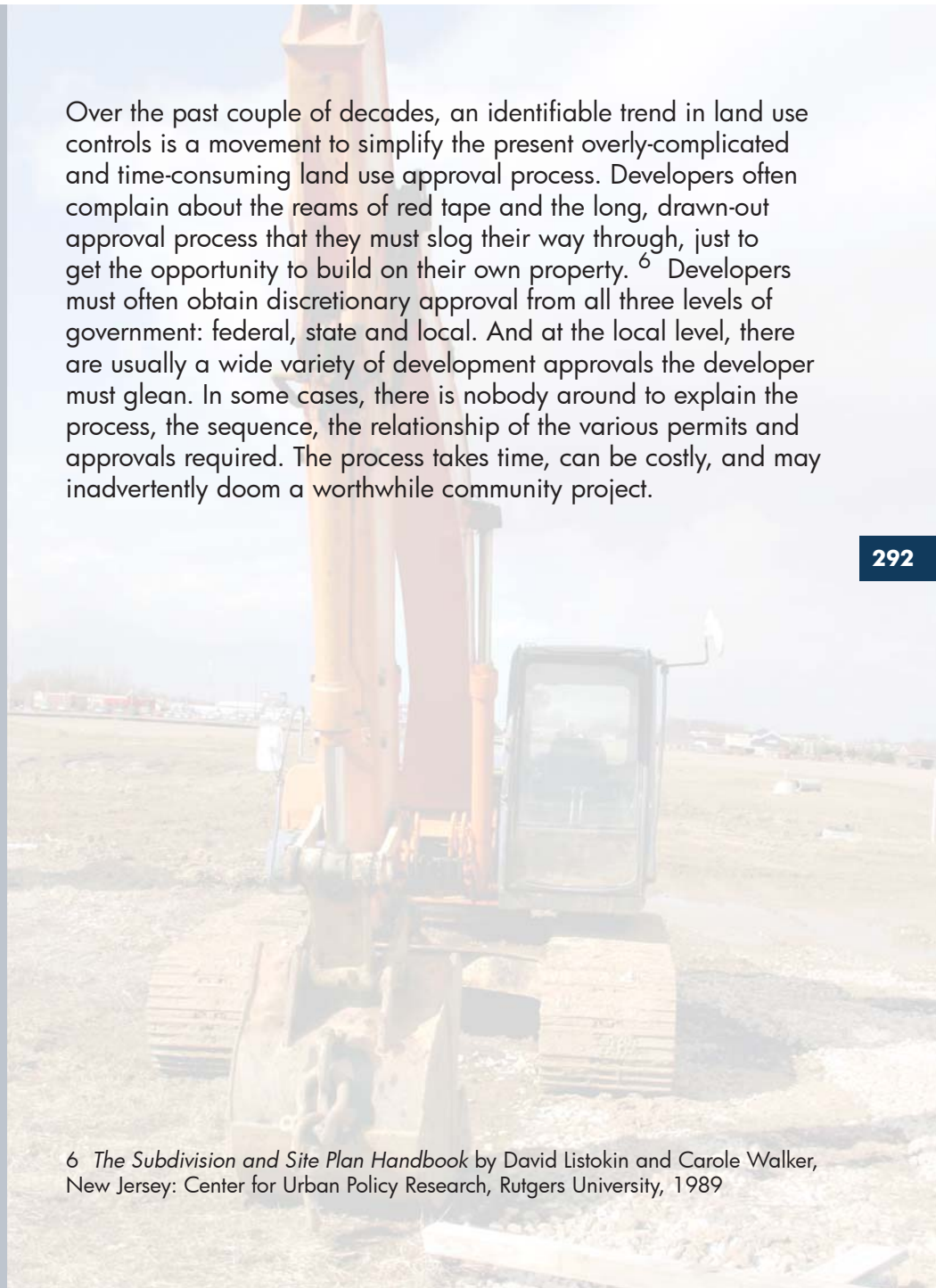
Zoning Ordinances and Land Use Controls

During the Warren G. Harding administration, in 1922, a draft Standard State Zoning Enabling Act (SZEA) was issued. The draft zoning enabling legislation was so popular at that time that 43 states enacted it. Approximately 22 million people, living in 200 zoned cities, came under its provisions. That number represented about 40 percent of the urban population in America at that time. [1] The major principles promulgated by the SZEA entailed the creation of districts for separation of incompatible uses. The Act used a set of broad purposes which stated that "such regulations be made in accordance with a comprehensive plan." [2]

In the minds of metropolitan officials and the general public, it is widely understood that zoning has both lived up to and failed its promise. Segregation of land uses in cities has all but destroyed the essence of mixed-use, vibrant neighborhoods. [3] While most developers will attest that, prior to the Great Recession, zoning had contributed to a great rise in housing values, other critics complain that since the 1920s, zoning is exclusionary and, rather than only segregating land uses, it has also separated the poor from the rich. [4] Others have advanced the notion that zoning has prevented the land development community from building more affordable housing near quality schools and employment centers. [5]

1 "Constitutionality of Zoning," by Alfred Bettman in 37 Harvard Law Review, pp. 834-835, 1924
2 "A Standard State Zoning Enabling Act Under Which Municipalities May Adopt Zoning Regulations, § 3 Purposes in View," Recommended by United States Department of Commerce, 1925
3 *The Death and Life of Great American Cities* by Jane Jacobs, Random House and Vintage Books, New York, NY, 1961
4 "Preserving Property Values? Preserving Proper Homes? Preserving Privilege? The Pre-Euclid Debate Over Zoning For Exclusively Private Residential Areas 1916-1926," in 56 U. Pitt Law Review 364, 1994
5 "Ecology and Housing: Virtues in Conflict," by Richard F. Babcock and David L. Callies, in Modernizing Urban Land Policy, Baltimore: Resource for the Future. 1973

Over the past couple of decades, an identifiable trend in land use controls is a movement to simplify the present overly-complicated and time-consuming land use approval process. Developers often complain about the reams of red tape and the long, drawn-out approval process that they must slog their way through, just to get the opportunity to build on their own property. [6] Developers must often obtain discretionary approval from all three levels of government: federal, state and local. And at the local level, there are usually a wide variety of development approvals the developer must glean. In some cases, there is nobody around to explain the process, the sequence, the relationship of the various permits and approvals required. The process takes time, can be costly, and may inadvertently doom a worthwhile community project.



6 *The Subdivision and Site Plan Handbook* by David Listokin and Carole Walker, New Jersey: Center for Urban Policy Research, Rutgers University, 1989

Energy Efficient Buildings

Throughout the Millennial Plan for 2040, planners have discussed and proposed greater building densities and more compact development. This strategy of denser, more closely built housing units and commercial centers, along with mixed use neighborhood centers, offers the advantage of energy efficiency and land conservation. Bestselling author Richard Florida, in his book *The Great Reset*, refers to the concept of denser development this way:

"New Yorkers produce less waste, burn less fuel, use less water, and use much less electricity, mostly because they drive less and live in the most energy-efficient residential structures in the world: **apartment buildings**." [7]

Similarly, Vishaan Chakrabarti in his book, *A Country of Cities*, discussing higher density buildings in urban districts, says it this way:

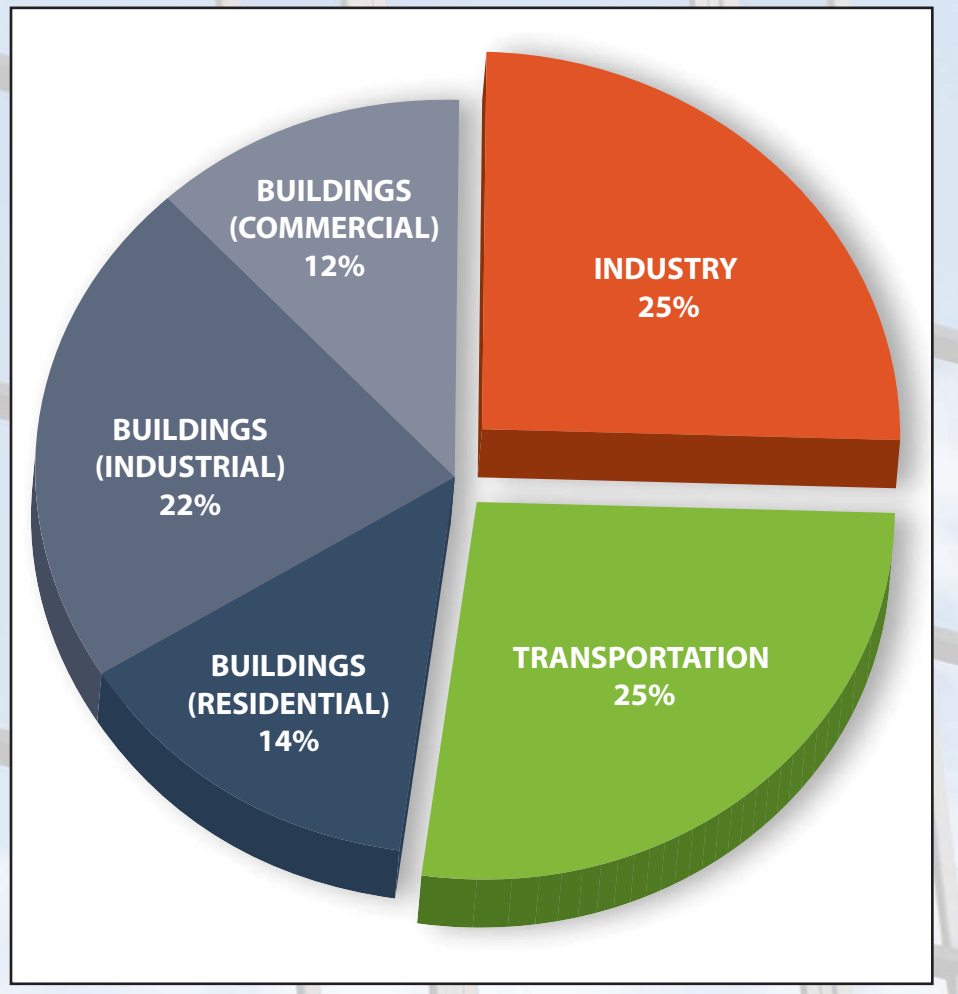
> *"….heating and cooling costs per person in single-family suburban homes are far greater than those in* **apartment buildings**, *largely because houses are highly inefficient thermal envelopes that allow heat and air-conditioning to escape through roofs, windows, and foundations. By contrast, apartments heat and cool each other; and since apartments tend to be smaller than houses, they lend themselves to far more efficiency and therefore lower cost per person. Also, infrastructure costs – less noticeable but no less impactful – are more expensive in suburbs than in cities. Services including water, sewer, oil, gas, police, ambulance, fire protection, and garbage collection must traverse greater distance to reach customers in dispersed communities than in compact urban districts. Suburban residents incur these additional costs in the form of higher taxes and fees."* [8]

7 *The Great Reset* by Richard Florida, Harper Collins Publishers, 2010, page 153
8 *A Country of Cities* by Vishaan Chakrabarti, Metropolis Books, 155 Sixth Avenue, 2nd floor, New York, NY, 10013, 2013

Southwest Indiana and Northwest Kentucky are certainly not New York City. However, many of the advantages of denser development and more compact housing patterns apply to this region and its 2040 future. The nation's buildings consume around 71 percent of the electric power generated while at the same time creating 39 percent of the CO2 emissions generated in America. No doubt, improving the energy efficiency of both existing and new buildings in this country would have a major impact in reducing total greenhouse gas emissions. Perhaps the single most important move that a city can make in reducing greenhouse gas emissions is to concentrate on making its new and existing buildings more energy efficient. [9] Figure 7-1 shows the current breakdown of greenhouse gas emissions in the US.

9 *Emerald Cities* by Joan Fitzgerald, Oxford University Press, 2010, pp. 78-79

Figure 7-1: Sources of Greenhouse Gas Emissions [10]



There is great potential for energy savings in the United States by retrofitting existing buildings with low-temperature heating boilers, heat exchangers in ventilation systems, photovoltaic and solar thermal systems, fuel cells, triple-glazed windows with inert gas between panes, and thermal insulation installations in walls and attics. In the design and engineering of new buildings there is even greater potential to affect overall energy efficiency. Only by adopting stricter energy codes can cities significantly benefit from major building energy savings. Wide-scale adoption and enforcement of stringent building energy codes could have a major impact on energy efficiency and curbing greenhouse gas emissions. [11]

An important model building energy code has been developed by ASHRAE (the American Society of Heating, Refrigerating and Air-Conditioning Engineers). Standard 189 requires buildings to be 30 percent more efficient than the existing national code and net zero by 2030. However, adoption and use of Standard 189 is voluntary, thereby limiting its impact. Kent Peterson, former president of ASHRAE, has suggested that the next step in promoting building energy efficiency will be requirements for building energy labeling, making labeled buildings' energy performance public knowledge. For example, per legislation in California, nonresidential building owners or operators are required to disclose an Energy Star rating and other energy usage data from the previous year to prospective buyers.

10 *Architecture 2030 and the American Institute of Architects.* Data published by the AIA in collaboration with Edward Mazria of Architecture 2030, based on statistics gathered by the U.S. Energy Information Administration (http://www.architecture2030.oprg/news/resources/AIA-Arch2030FactSheet.pdf;http://www.architecture2030.org/currentsituation/building_sector.html)

11 *Emerald Cities* by Joan Fitzgerald, Oxford University Press, 2010, Page 87

Traditional Neighborhood Design (TND)

Historic downtown neighborhoods are characterized by more compact, mixed land use designs. TND is based on prescriptions formulated from analyzing traditional neighborhoods before the advent of the suburban boom of the 1950s and 1960s. TND employs certain physical design characteristics shown in the Neighborhood Node Prototypes in Chapters 2 and 3, and including the following:

- Neighborhood area is limited in size, with clear edges and a focused center. A circle with a diameter of one mile (half mile radius) makes most areas within the prescribed area walkable.
- Shops, offices, schools, and residences for all income levels are located in close proximity to one another.
- Streets are sized and detailed to equitably serve the needs of both the car and the pedestrian, without one squeezing out the other.
- Building size and character are generally regulated to spatially define street frontages and public squares.
- Squares and parks are distributed and designed intentionally as specialized places for public activity and recreation.
- Well-sited civic buildings act as symbols for community identity and provide places for purposeful assembly. [12]

12 "Codes" by William Lennertz in *Towns and Town-making Principles* by Andres Duany and Elizabeth Plater-Zyberk, New York: Rizzoli, and Cambridge, MA: Harvard University Graduate School of Design, 1991, page 102

The community objectives that are reinforced by Traditional Neighborhood Design (TND) concepts include the following:

- Compact site and building form reduces requirements for energy, infrastructure, and auto usage, while lessening pollution and facilitating public transit.
- A full range of housing types and work places are offered, including detached, attached, adjunct housing mixed with retail and workplaces; all integrating various age groups and economic classes.
- Provision of comfortable public places allows citizens to get acquainted and watch out for one another, enhancing security and cutting down on crime.
- Providing the majority of daily life's necessities, all within walking distance, allows elderly and young alike to gain independence of movement.
- Suitable civic buildings are intended to engender pride, cooperation, and democratic action. [13]

13 "The Social Costs of Sprawl," by Robert H. Freilich and Bruce G. Peshoff, 29 Urban Law, pp. 183-185, 1997

Transit Oriented Development (TOD)

Peter Calthorpe, architect and planner, coined the term Transit Oriented Development (TOD) as an antidote to sprawl. The key feature of TOD is, of course, proximity to public transit stations and stops. For large metropolitan areas like Chicago and New York, transit means rapid rail. But for small to medium sized cities, the term usually refers to bus transit. Calthorpe challenges cities of all sizes, in both urban and suburban areas, to employ new concepts of transportation corridors and centers. These new planning concepts promote the following developments:

- Increased density of development along transit corridors;
- Location of residences, jobs, and retail destinations closer to public transit facilities;
- Provision of mixed-use development within walking distance of residential areas;
- Development of multimodal, interconnected transportation networks; and
- Development of urban design guidelines that encourage a more pedestrian, walkable environment. [14]

14 *The Next American Metropolis: Ecology, Community, and the American Dream* by Peter Calthorpe, Princeton Architectural Press, New York, NY, 1993

TOD can be defined as a mixed-use community that is designed so that residents have an average 2,000 feet walking distance to a transit stop and to the core commercial area. TODs can be located in virtually any area, from newly urbanizing exurban locations to infill sites, but they must have **convenient (existing or planned) transit access**. In the words of Peter Calthorpe, architect and planner:

> *"TOD not only promotes alternatives to auto use, but can be a formula for affordable communities -- affordable in many senses. Communities are affordable to the environment when they efficiently use land, help to preserve open space, and reduce air pollution; they are affordable for diverse households when a variety of housing types, at various costs and densities, are encouraged in convenient locations."* [14]

Updating Land Use Plans and Zoning Ordinances

All three counties within the RPSD area are in one phase or another of updating their comprehensive land use plans, which inherently means changes to their existing zoning classifications and designated zones as shown on their official zoning maps. For purposes of this Regional Plan for Sustainable Development, underlying zoning designations are considered to be **Base Zoning Districts** within each county and any new designations growing out of this Plan can be handled as **Overlays** to the base zoning districts. These **Overlays** should be included in any county Comprehensive Plans and in any revisions to prevailing zoning ordinances. Proposed **Overlays** are intended to provide development incentives and create value rather than to restrict growth. Primarily, they are proposed to provide more flexibility and allow for greater creativity in new developments. Overlay zoning classifications can be used to either supplement or displace any zoning categories or designations and their detailed development requirements, in the most updated county-wide comprehensive land use plans, zoning ordinances, or subdivision regulations in Vanderburgh, Warrick, and Henderson counties. However, it is important to note that incorporating changes presented in this document will require review of state zoning enabling legislation by an attorney licensed in either Indiana or Kentucky, or both.

The overlay zones, in some applications, will tend to "layer" land development options, inviting flexibility and creativity in design. For example, a land parcel within a half mile of Highway 41 could conceivably have a base zoning district (its current zoning classification) plus three different overlays: a BCD Zone, an MX Zone, and a PD/TN Zone. This layering allows a sensitive developer to select the most appropriate application for a given parcel. The layers allow him to create a mixed use, mixed income neighborhood, with vision and foresight, rather than merely building a conventional subdivision. See maps at the end of the Overlay Zoning District narrative for examples of "layering of overlays."

Purposes of Zoning Overlays

Maps on the following pages 304 - 314 for each of the three counties (Vanderburgh, Warrick, and Henderson counties) show overlay zones to be adopted at the option of the county officials and the Planning Commissions of each of the three. These overlay zones are intended to be implemented for the following purposes:

1. Work hand-in-hand with existing Tax Increment Finance zones and other economic development districts to forward sustainable economic development strategies in each of the three counties.

2. Adopt TIF Affordable Housing "Set Asides" (funds set aside from TIF proceeds) to be used as gap financing within each of the TIF Districts.

3. Foster the preservation of scarce natural resource areas, scenic recreational sites, managed lands, and environmentally sensitive development zones.

4. Guide the design and development procedures and processes in historic neighborhoods and historic downtowns in order to enhance and preserve valuable architectural and community cultural resources.

5. Promote transit-worthy development near present and future bus lines to increase development density and provide wider choices in transportation options.

6. Encourage mixed land uses and mixed income neighborhoods with active neighborhood centers where walking and biking is facilitated and the use of transit is prestigious and convenient.

7. Incentivize private builders, developers and realtors to provide affordable workforce housing in mixed-income neighborhoods near good schools and good jobs.

8. Adopt land use overlay zones that are meant to aid builders and developers in seeking out new markets, streamlining the development process, and making a fair profit. New land use overlay zones are not meant, in any way, to constrain or restrict development. Restrictions of this nature would result in higher prices for housing, which is not the intention of this Regional Plan.

The only overlay zone in effect at this time in the region is the Haynie's Corner Arts Overlay Zone in the Haynie's Corner District in Evansville. The primary function of this overlay zone is to allow work quarters and offices in residential buildings, in order to encourage artists to have in-home studios and galleries in the Art District. The present overlay zone does not have detailed guidelines for building form or scale. The next section on "Form-Based Codes" can be instructive for specifying design standards in the Haynie's Corner Arts District Overlay Zone.

Form-Based Codes (FBCs)

For the three-county area, it will be important to standardize the new overlay zones by utilizing a Form-Based Codes (FBCs) approach. The Form-Based Code components of each overlay zone will be the detailed development standards and guidelines that will make the zones unique. The advantage of a "Form-Based Codes" (FBCs) approach in overlay districts and floating zones is that FBC are based on spatial-organizing principles. Form-Based Codes help specify the details that are most important when a community is trying to implement walkable, human-scaled neighborhoods. A Form-Based Code focuses primarily on street design and urban form, emphasizing the aspects of buildings that form the "walls" of public spaces. A critical component of the FBC's approach is specifying the placement, height, width, and the particular way the buildings interact with the public space (called the "frontage").[15]

15 *Form-Based Codes: A Guide for Planners, Urban Designers, Municipalities, and Developers* by Daniel G. Parolek, AIA; Karen Parolek; and Paul C. Crawford, FAICP, John Wiley & Sons, Inc., Hoboken, NJ, 2008

Form-Based Codes (FBCs) as defined by the Form-Based Codes Institute are usually structured to include certain minimum elements and they can also include some optional ones. The minimum components are:

- **A Regulating Plan** – A plan or map assigning the code's various design standards to physical locations within the community.
- **Public Space Standards** – Specifications for sidewalks, travel lanes, trees, street furniture, and the interface with buildings.
- **Building Form Standards** – Regulations controlling configuration, functions, and features of buildings where they directly shape the public realm, which can include building placement and form, parking, setbacks and encroachments.
- **Administration** – Requirements for applying for project approval and review process.

Optional elements that may appear in the Form-Based Code, depending on the particulars of the neighborhood or district are:

- **Block and Lot Standards**
- **Building Type and Use Standards**
- **Architectural Standards**
- **Green Building Standards**
- **Landscaping Standards.** [15]

15 *Form-Based Codes: A Guide for Planners, Urban Designers, Municipalities, and Developers* by Daniel G. Parolek, AIA; Karen Parolek; and Paul C. Crawford, FAICP, John Wiley & Sons, Inc., Hoboken, NJ, 2008

For the overlay districts and floating zones specified in this Regional Plan for Sustainable Development, a type of FBC called a **Street Frontage-Based Code** is recommended for the three counties of Vanderburgh, Warrick and Henderson Counties. The Street Frontage-Based Code directs the public realm (street space) by specifying proper building form and function as it relates to the public street right-of-way. It focuses on street design, as well as the public pedestrian spaces along the street and how the adjacent buildings define these public spaces.

The Heart of Peoria code adopted in April of 2007 by Peoria, Illinois is a good example of a Frontage-Based FBC. The Street Façade-Based Code (SFBC) uses streets as its "organizing principle," advancing regulations on specific street and block designs and the actual, final location of streets within the neighborhood or district. The street designs include specs for lane and sidewalk widths, street tree configuration, curb radii, and other street-related specifications. The SFBC also includes specific guidelines governing the relationship of the façades of buildings making up the streetscape frontage. Façade treatment guidelines may include such items as entrance locations or quantity of windows on the street-facing building façade (façade fenestration).

Zoning Controls

RECOMMENDATION GR-1: *In zoning ordinances of the three metro counties, revise the parking requirements in all districts based on daily parking needs, not worst case parking loads. Fine tune parking requirements based on the latest Urban Land Institute and American Planning Association standards, so that square footage requirements for asphalt and concrete are minimized rather than maximized.*

The only zoning category that generally has been responsive to actual daily needs is the parking requirement standards for restaurants. All of the others are too paving intensive. Consider maximum parking area standards rather than minimum standards, so that developers and building owners have more flexibility in analyzing their actual daily parking needs. The amount of parking historically required in our cities and towns is usually way overdone, resulting in too much paved parking surface. This policy of requiring everyone to provide the maximum possible parking provisions for their respective land use is redundant, wasteful, and unsustainable.

All three counties should undergo detailed studies of the parking requirements in their respective zoning ordinances with an eye toward reducing the amount of wasteful paving in both urban and suburban areas.

RECOMMENDATION GR-2: Prioritize land development in three counties through streamlined processing and approval of development proposals that occupy vacant urban land and utilize existing infrastructure.

RECOMMENDATION GR-3: *Municipal Planning Agencies should adopt the following development guidelines for their Comprehensive Plan and Zoning Ordinance revisions and updates.*

1. *New development and revitalization is encouraged to occur along or in direct proximity to established traffic corridors where infrastructure is already in place and where municipal sewer and water systems already exist.*

2. *Average density of future new development is encouraged to be in the net density range of seven (7) to sixteen (16) dwelling units per acre. This net density calculation does not include streets serving the development.*

3. *New development is encouraged to occur within or contiguous to existing incorporated cities, towns or villages where basic services such as fire and police protection already exist. Or they may occur in proximity to special districts, such as the new North High School area in northern Vanderburgh County.*

4. *New development is encouraged to be of mixed land use and mixed income, in a compact, walkable configuration that reinforces neighborhood and community sense of place.*

5. *New development is encouraged to include ample open spaces, both active and passive, for recreation and relaxation, wherein all residents are within a 10 minute walk to a park from their home.*

6. *New development is encouraged to utilize the advantages of a revised and refined PUD Ordinance (called PD) or to fall within an Overlay Design District, allowing flexibility in community design. New development in these areas will strive for presenting a unique and distinctive character.*

7. *New development that is sensitively designed in a mixed land use and mixed income configuration, in priority community locations, will be eligible for development incentives such as expedited scheduling of approvals, waivers of fees and permits, tax benefits and priority status for public improvements that will magnify the attractiveness of the development.*

8. *New developments whose assessed taxes do not cover the cost of public services will be assessed impact fees to compensate taxpayers for providing services that are not paid for by the development's levied property taxes.*

9. *Sewer and water service extension will be approved according to a priority scaling system that directs growth to areas where there are municipal services, such as public education and fire protection, already in place.*

10. *Incorporated areas will examine their services and tax rates and determine updated annexation guidelines in order to equitably service the citizens that border on these incorporated areas.*

RECOMMENDATION GR-4: *In conjunction with development guidelines listed above, for revisions of Comprehensive Plans, incorporate the following zoning overlay zones into the present zoning ordinances of the three counties – Henderson, Warrick, and Vanderburgh – in order to reinforce compact, cohesive, mixed use, mixed income neighborhoods. Apply the overlay zones, where appropriate, to both infill and new development at the urban fringe.*

Incentive Zones (Flexible Zones)

These zones are flexible in that the applicant may elect to utilize the original underlying zoning provisions or may opt to go for the incentives offered in the flexible overlay zoning category.

"BCD" Zone - Bus Corridor District

The purpose of the BCD Zone is to encourage high density housing development along major transit corridors. Densities may range from 10 dwelling units per acre to 30 dwelling units per acre. The zone can be described legally as in the following example:

> The BCD Zone consists of properties on either side of the planned Bus Rapid Transit (BRT) corridor extending from Highway 41 at the northernmost Vanderburgh County Line, to downtown Henderson, Kentucky. BRT corridors are defined as having dedicated bus lanes, used exclusively by BRT buses. All or any part of properties within one-half mile of the centerline of Highway 41 for the length shown, are eligible through application, for high density housing zoning changes. Applicant must submit a site plan for the proposed high density housing development. The plan must be prepared by a licensed architect or a certified planner. The number of housing units is unlimited, provided the applicant supplies adequate parking and observes building and fire code separations. Buildings must meet all applicable fire and building code provisions.
>
> Development along the Highway 41 BRT corridor would be eligible for tax abatement, phased in over 7 years; plus water and sewer rebates, allowing the developer to recoup the costs for water and sewer utility installations over a graduated, 7 year period. The project is also eligible for a filing fee and building permit fee waiver. The incentives mentioned in this paragraph are available for projects that agree to meet the following affordable workforce housing provisions:

- Five percent (5%) of the housing units must be developed for very low income individuals or families, defined as having household income that is 30-50 percent of the Area Family Median Income.
- Five percent (5%) of the housing units must be developed for low income individuals or families, defined as having household income that is 51-80 percent of the Area Family Median Income. The total for very low plus low income housing is, therefore, a grand total of ten percent (10%).
- Very low and low income housing is enforced through a **deed restriction or an enforceable contract with a public housing authority** or community development corporation or community development agency.

NOTE: Where the BCD Zone falls inside a TIF District (such as at North 41), a TIF Set-Aside provision is meant to provide gap financing for the developer.
See Figure 7-2 for extent of BCD Zone.

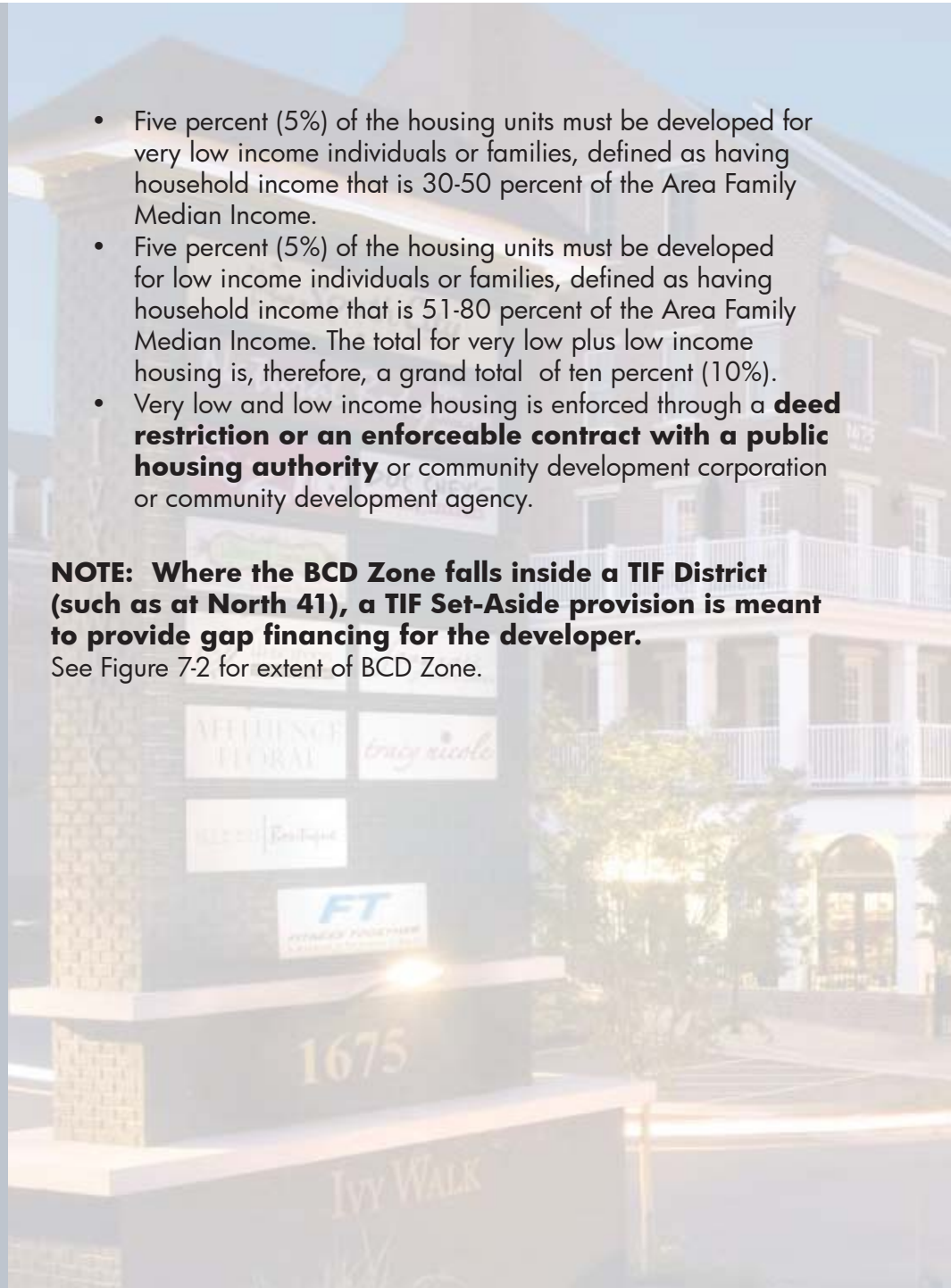
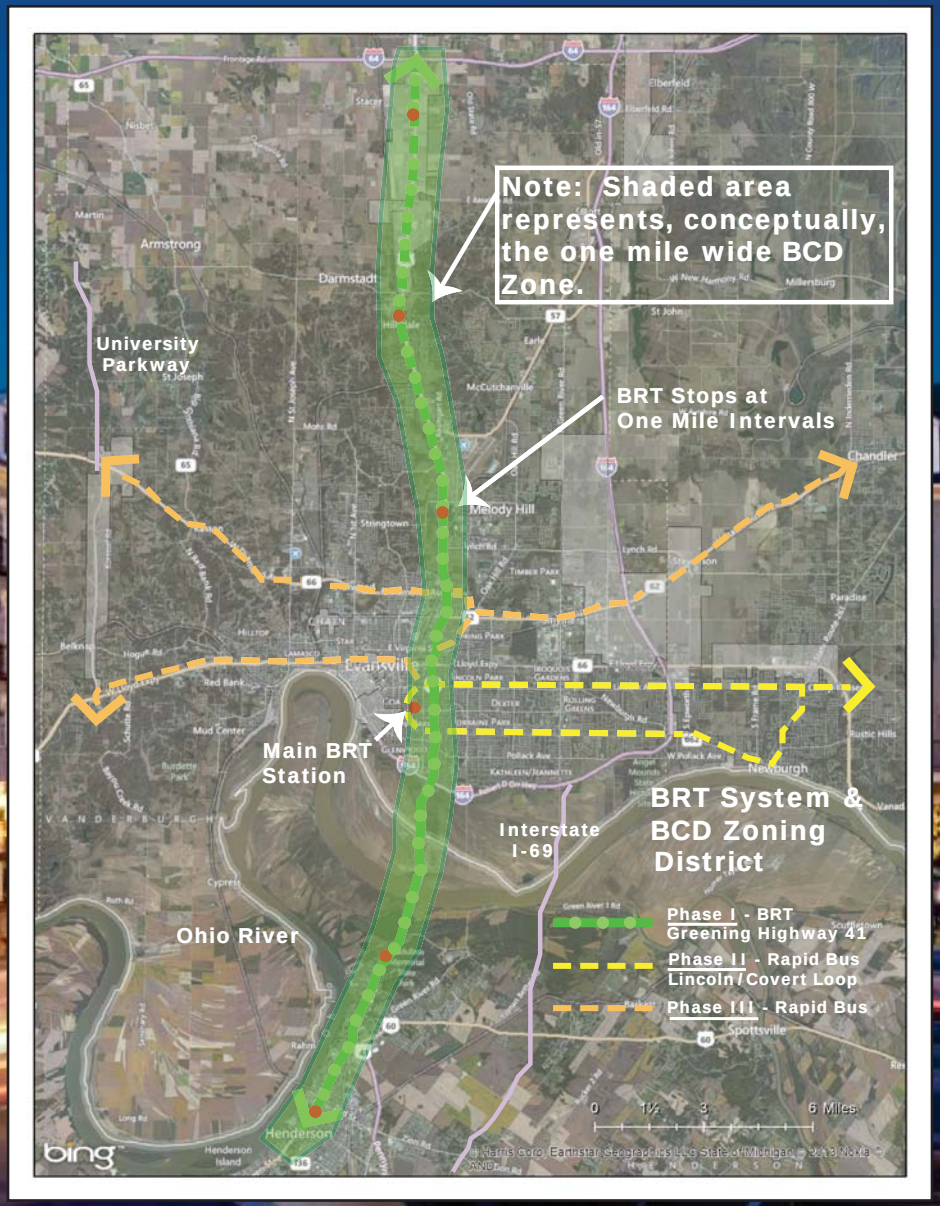


Figure 7-2: BRT Map Showing Extent of BCD Zone along HW 41



"IL" Zone - Industrial Legacy Zone

The maps shown in Figure 7-3 and Figure 7-4 indicate urban areas that were once bustling with manufacturing, tool and die, assembly and fabrication. These areas have often been converted from active processing facilities to more passive functions, such as bulk shipping and warehousing. Property owners within the "**IL**" zones are eligible to apply for manufacturing incentives such as environmental remediation (brownfields) funding, tax abatement and utility rebate programming, when they equip their properties for active production and exporting of products. The "**IL**" zone represents an attempt to modernize the **Urban Enterprise Zone** concept, implemented in Evansville in 1984 and to create jobs near urban affordable workforce housing neighborhoods. It should be noted that when a TIF is expanded into the Urban Enterprise Zone, the TIF provisions for individual owners do not apply until such time as the ten-year Tax Abatement incentive for Urban Enterprise Zone properties has run its course.

Figure 7-3: MX IL Zones

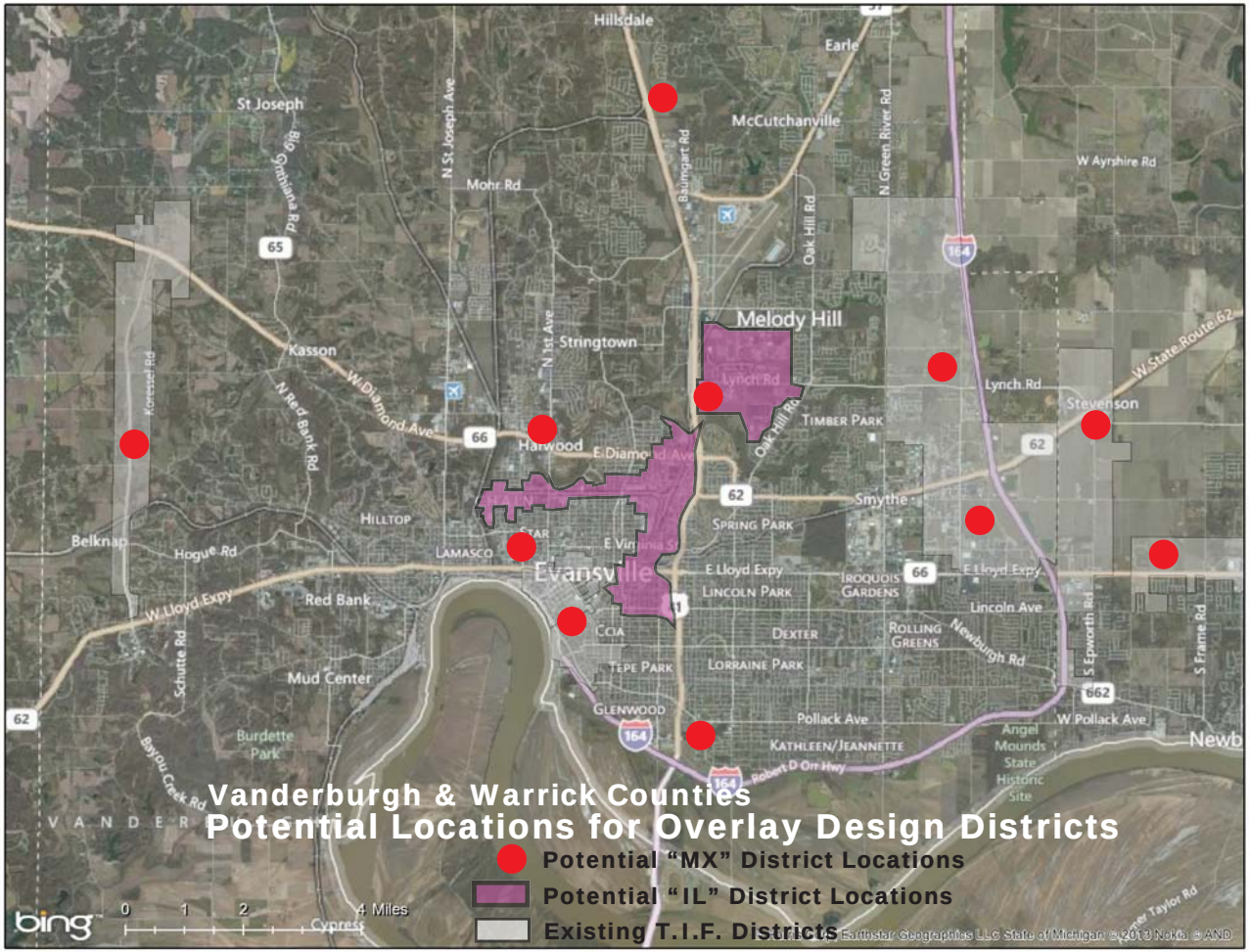
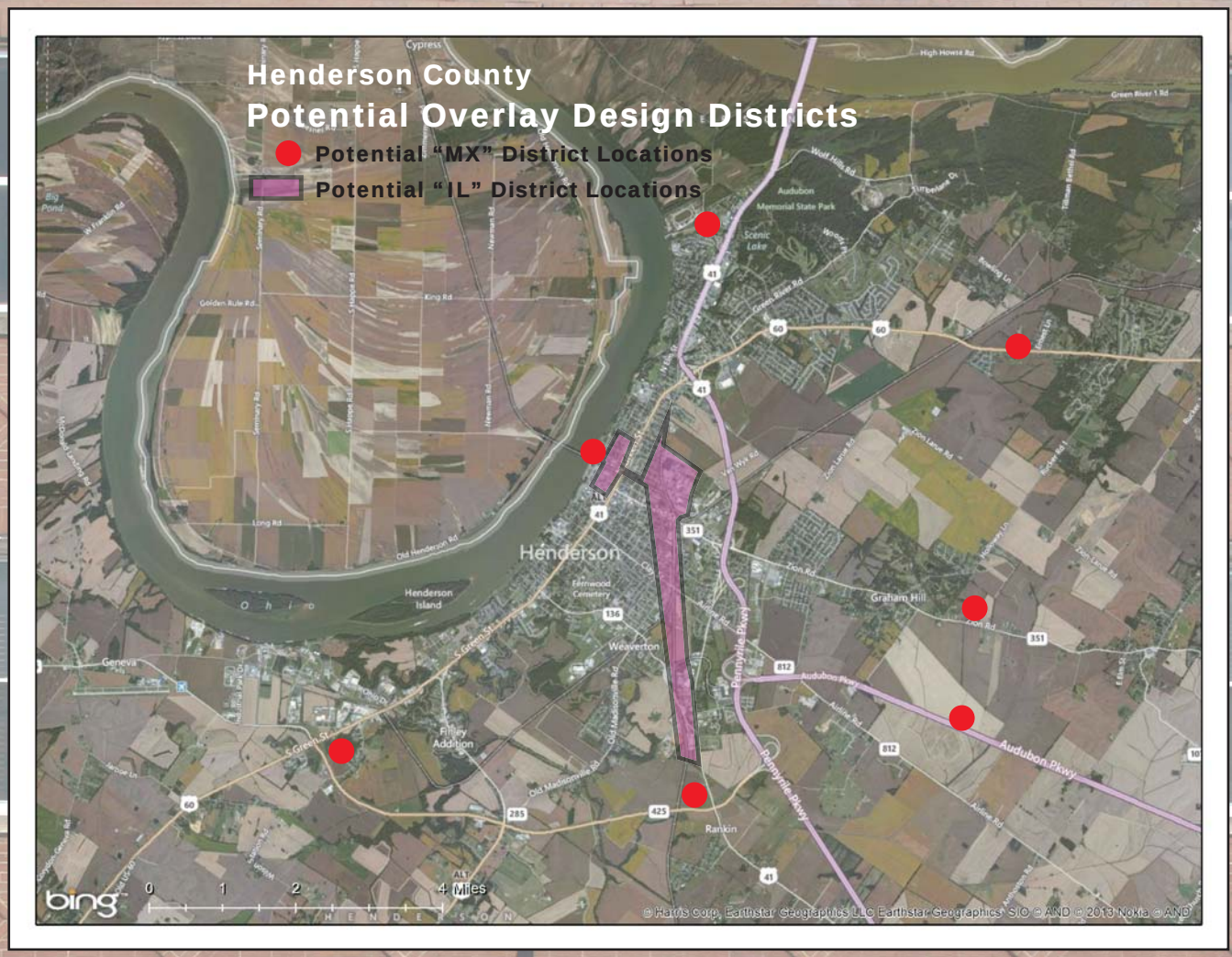


Figure 7-4: MX IL Henderson Zones



Preservation Zones and Special Districts (Overlay Design Districts)

"NP" District - Neighborhood Preservation District

Neighborhood Preservation districts are residential and commercial areas that are worthy of protection, but may not have sufficient historical, architectural, or cultural significance to be designated historic districts. The purposes of an "**NP**" (Neighborhood Preservation) district designation are to:

- Protect and enhance desirable and unusual or unique physical features, design attributes, and recognized identity, attractiveness and charm;
- Promote and provide for economic revitalization;
- Promote and/or retain affordable workforce housing;
- Encourage and reinforce civic pride; and
- Ensure the integrated, orderly, and efficient growth and redevelopment of valued parts of the city.

A property designated to be in the Neighborhood Preservation (**NP**) category, must also be eligible to be within one or more of the base zoning classifications, such as high density residential (R-5) or light commercial (C-1). Consequently, authorized land uses must be permitted in both the regular zoning district, as well as the overlay zoning district. In the event of a conflict between the provisions of a particular "**NP**" district regulation and the base zoning district ordinance, the provisions of the "**NP**" district regulation apply.

A good beginning to conceive of areas to be designated as "**NP**" Districts are the Cultural Districts in Evansville (see pages 221 - 222), and the Letcher Street, Phase One Development Area in Henderson's East End.

Figure 7-5: NP West Franklin Design District

Figure 7-6: NP Overlay Design District

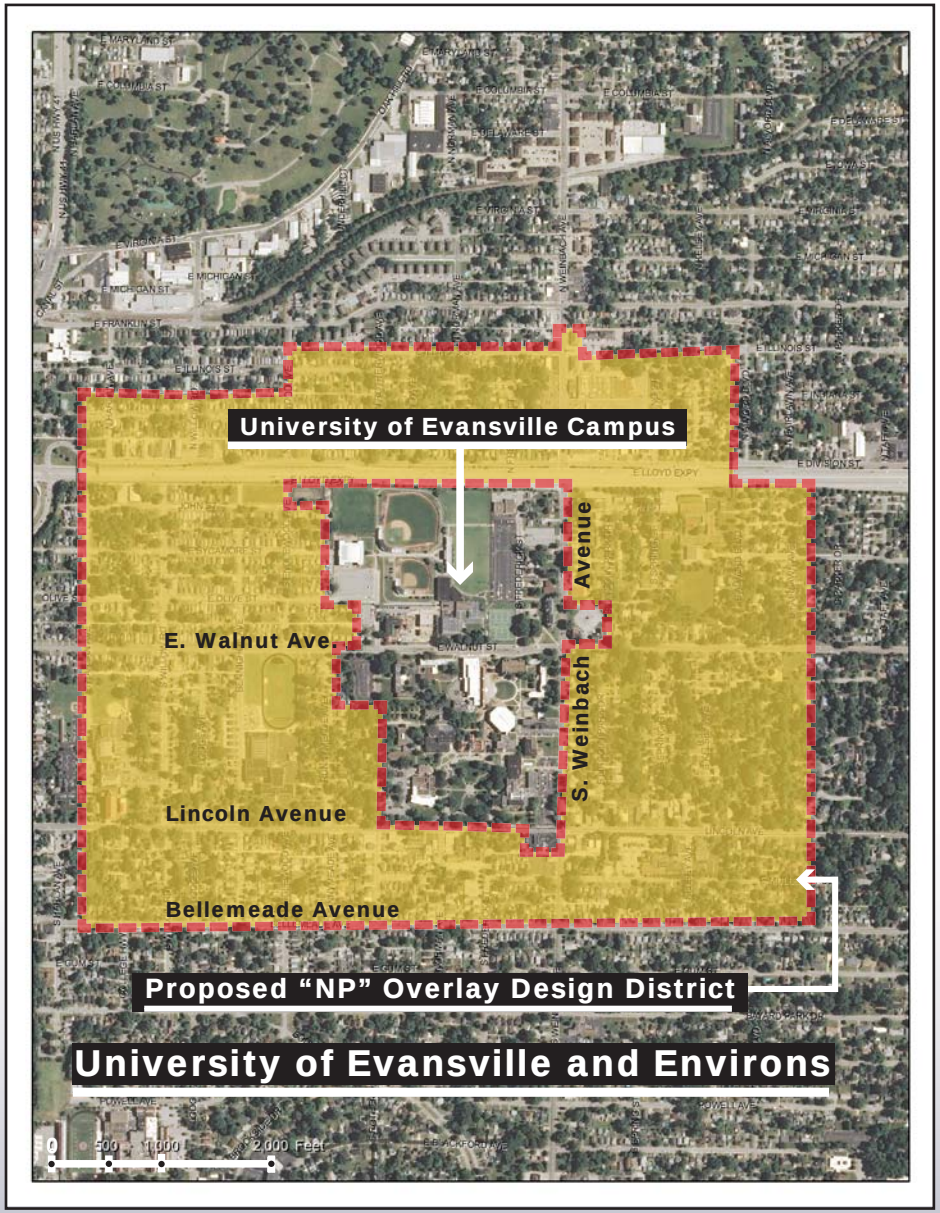
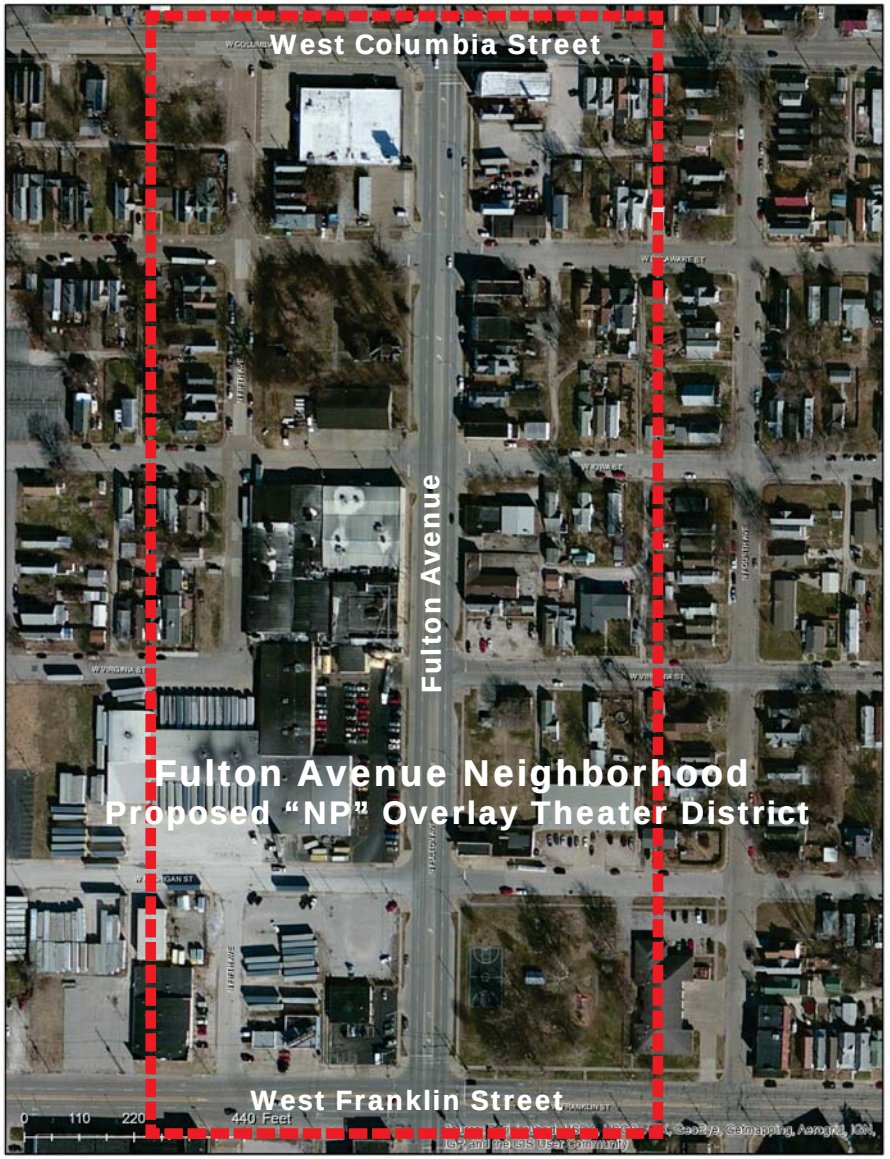


Figure 7-7: NP Overlay Theater District



"RP" District - Resource Protection District

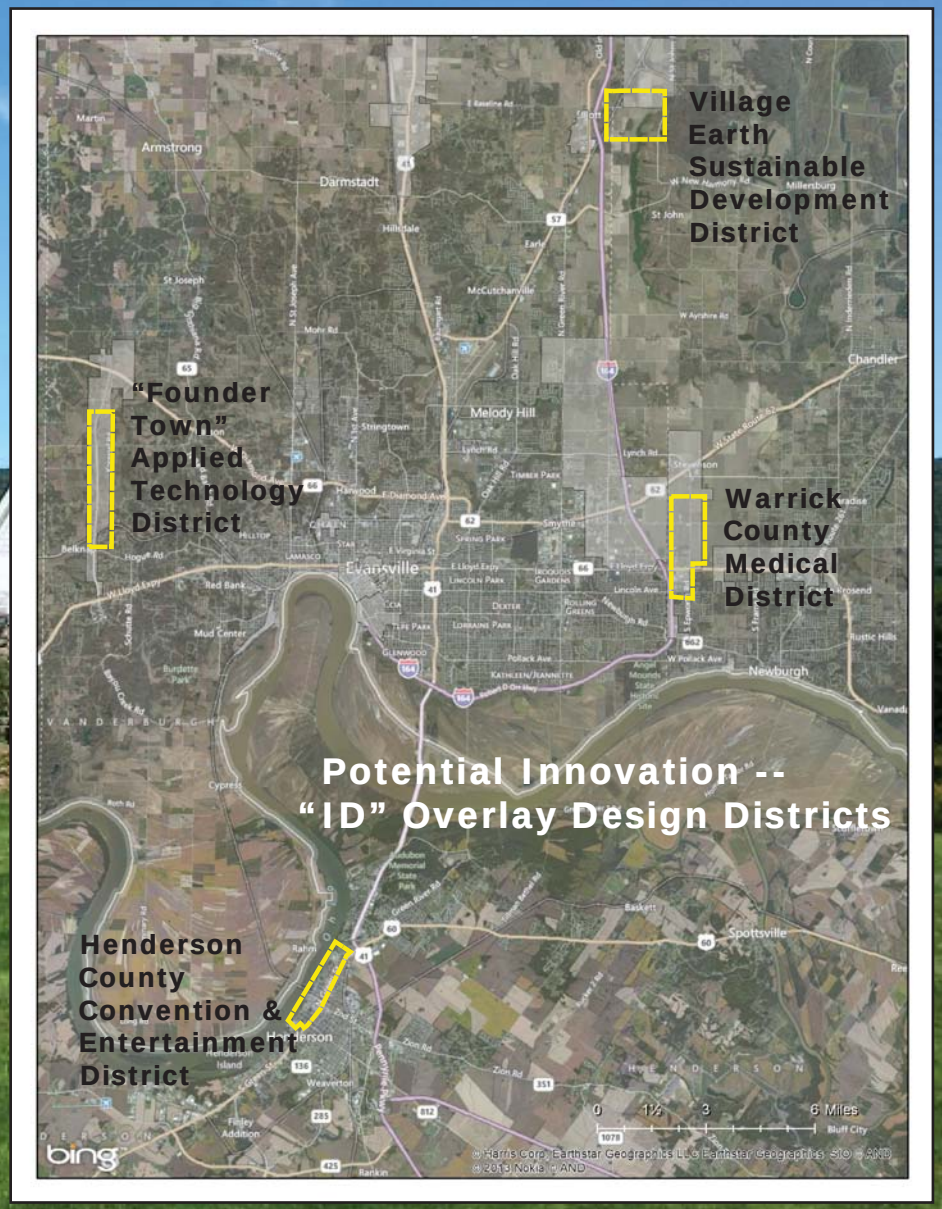
Resource Protection Districts are usually un-zoned lands or lands that are zoned agricultural. The RP designation is used to protect natural assets and resources as follows:

- Protect and preserve valuable farmstead and prime agricultural areas;
- Implement natural resource protection;
- Establish performance standards for rural businesses;
- Preserve pasture land or other special, natural/ environmental areas.

The "**RP**" district can also be used to establish a buffer of low-intensity functions along streams, floodplains, and similar environmentally sensitive areas. It is suitable for large tracts of open space, large agricultural tracts, or woodlands. [16]

16 *21st Century Land Development Code* by Robert H. Freilich and S. Mark White with Kate F. Murray, American Planning Association, 122 S. Michigan Ave., Suite 1600, Chicago, Illinois, 2008

Figure 7-8: Four ID Zones in the Three Counties



"ID" District - Innovation District

The "ID" Innovation District is a special use district that is unique within the region and has a special role to play in creating jobs, wealth, and prosperity. It is a district that has great potential for economic development and fortifying the economic base of the region. The land uses inside the Innovation District may be single-use or mixed-use. The character of the district will be unique, requiring skilled urban design and the utilization of a form-based code approach, capable of setting high standards for park land, open space, landscaped parking and grounds, pedestrian amenities, and civic art. In this Millennial Plan, the planners have specified Innovation Districts in each of the three counties of the region: Evansville's Founder Town, the Warrick Wellness Trail and Medical District, Village Earth, and the downtown Henderson Convention and Entertainment Zone. See the previous chapter in this volume for an outline of each of these key economic development projects. Each of these important areas will require a very different design and planning emphasis, along with specific standards for urban design and public space planning.

Core Neighborhood Zones (Floating Zones)

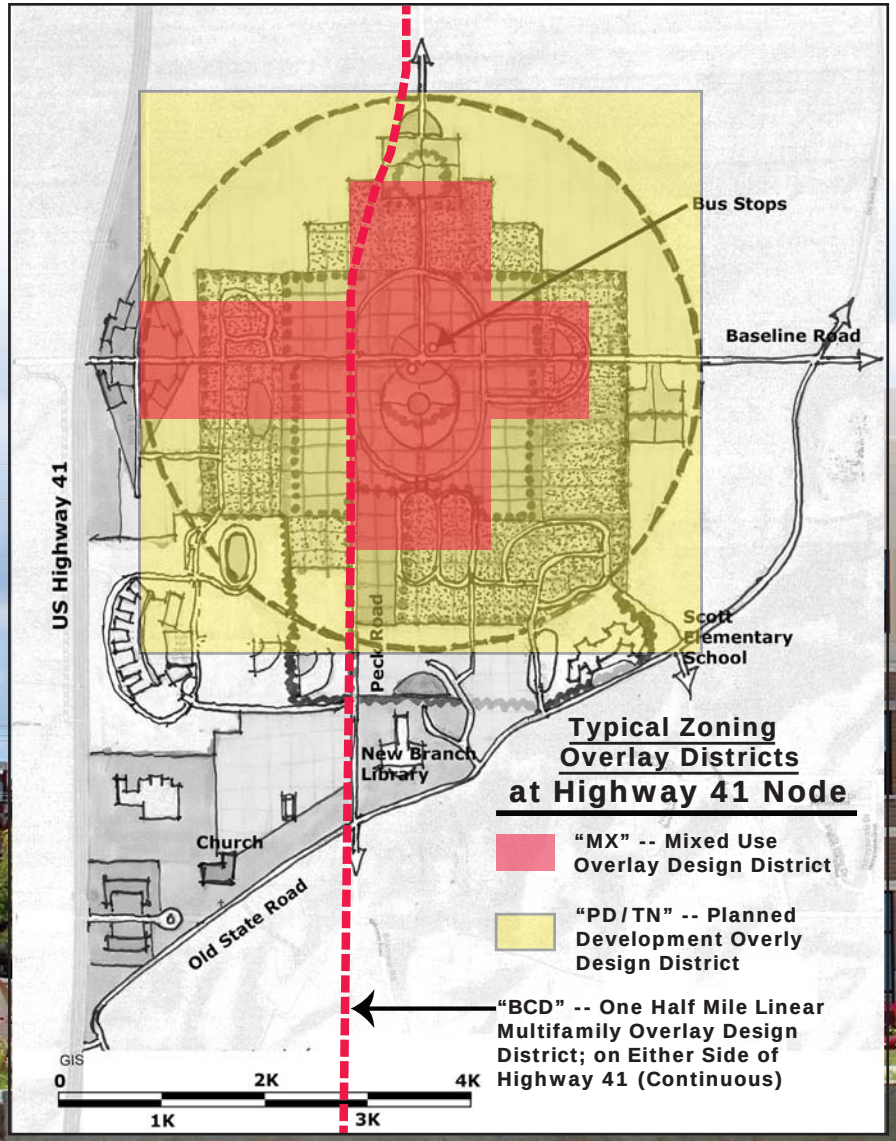
The zones in this category are called “floating zones” because not all of them are shown on an official zoning map. Those that are shown have the capability of shifting location at a later date, or adjusting to adjacent development by shrinking and expanding to respond to evolving neighborhood needs and requirements.

Layered Overlay Zones

This cluster of zones is used as a "seeding" strategy helping to germinate an entirely complete neighborhood with a full mix of residential, retail, service and office activities. The "**MX**" classification applies to the central or core area of a traditional neighborhood. In this particular zone, land-use regulation is de-emphasized and virtually any use is permitted, subject to strict form-based design standards, established and applied specifically and uniquely within this zone. The urban design standards devised for each of these zones are required to maintain a neighborhood commercial scale, to facilitate pedestrian activity, and to set up and maintain a special, unique character.

The diagram, Figure 7-9 shows the relationship of the three active zones mentioned in this section. The "**BCD**" zone comes first, and it is determined by the alignment of the Highway 41 BRT corridor. The "**MX**" zone comes next and occurs somewhere in direct proximity to the "**BCD**" zone. The "**PD/TN**" zone will usually be the last of the three, and it transforms the "**BCD**" classification into a more focused and design-specific "**PD/TN**" zone, as well as a complete neighborhood.

Figure 7-9: Potential "Layered" Zones at Nodes



"MX" Zones - Mixed Use Zones

As mentioned, the reason for these layered zones to be classified as "Floating Zones" is that they can change, adapt, transform and adjust to economic and social conditions, as well as to the demands of developers and community builders. The Mixed Use aspect of the "**MX**" zone means that it forms the core or heart of a traditional neighborhood. It will often feature buildings that average between two to three stories in height and will contain retail shops on the ground level and either offices, loft apartments or condos on the second and third floors of most mixed use buildings. Figure 7-10, Figure 7-11, and Figure 7-12 show proposed locations of the first batch of the "**MX**" zones. Many are initially related to the "Greening of Highway 41" effort. They are often located in TIF Districts where growth is anticipated.

Figure 7-11: MX Zones in Downtown Evansville

Figure 7-10: MX Zones in Vanderburgh and Warrick Co.

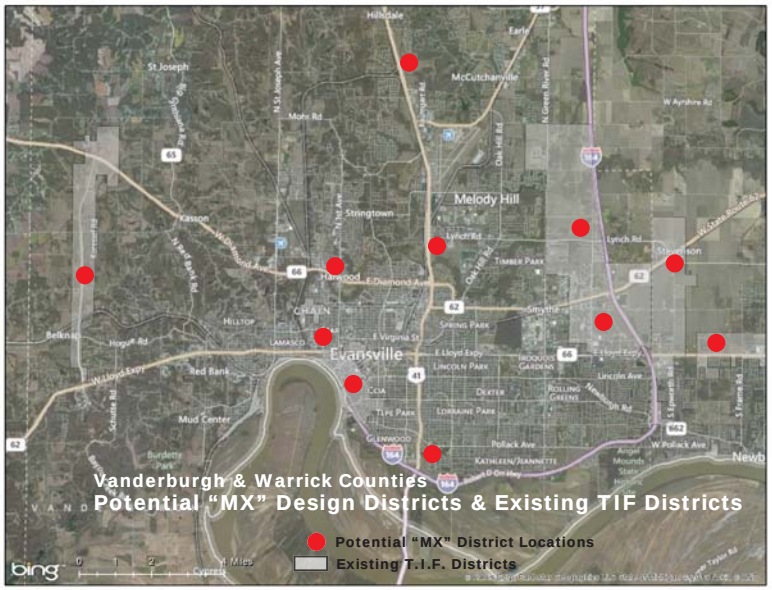
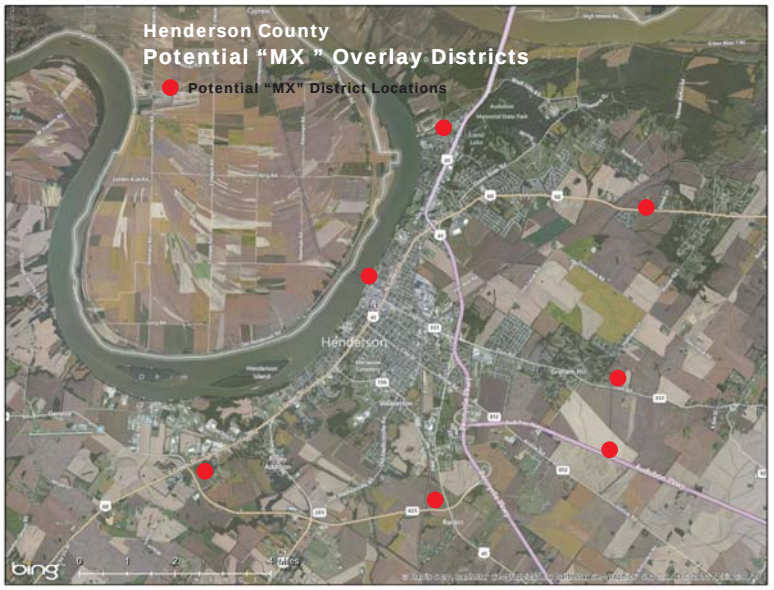


Figure 7-12: MX Zones in Henderson County



"PD/TN" Zone - (Planned Development/Traditional Neighborhood Zone)

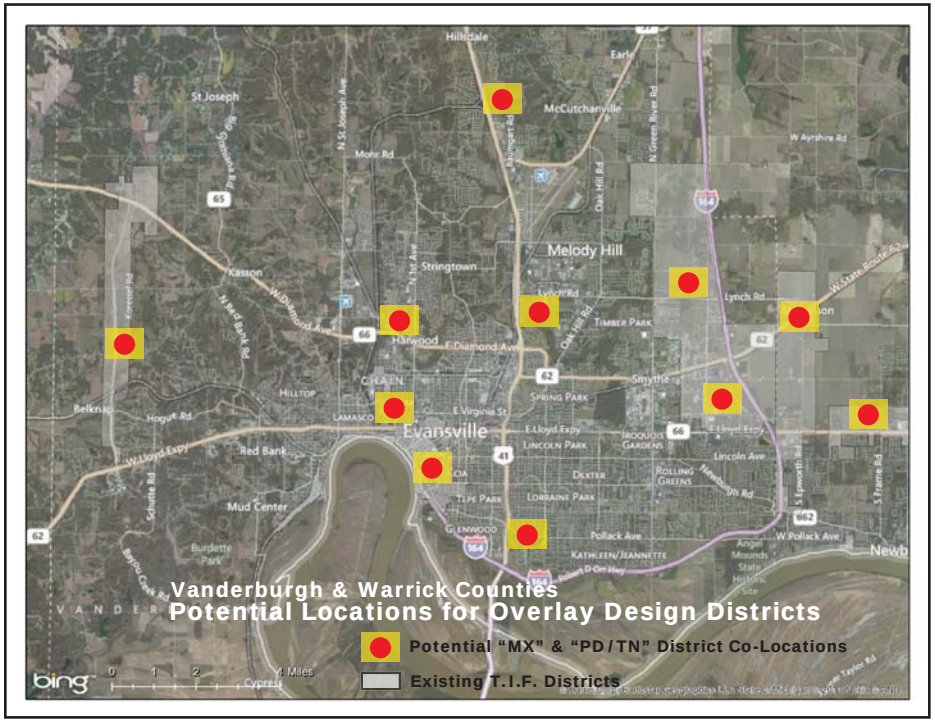
The "**PD/TN**" zone is meant to replace the present Planned Unit Development (PUD) zone in each county and replace it with this "greenfield" zone, conceived for new development on vacant infill acreage or on open suburban land, that is suitable for development. Greenfield locations must consist of acreage that surrounds or is fully contiguous to an "**MX**" mixed use, neighborhood center zone. The "**PD/TN**" designation is intended to encourage innovative mixed-use projects, planned over a minimum geography of 40 acres. Like PUDs of the past, the "**PD/TN**" development may be phased in over a period of years, as the developer responds to the marketplace. The "**PD/TN**" classification, along with its companion "**MX**" core designation, are both intended to encourage innovative mixed-use neighborhoods as an alternative to conventional, modern, use-segregated suburban developments. The "**MX**" and the "**PD/TN**" districts are mixed-use overlay zoning districts that are capable of (1) diversifying and integrating land uses that are within close proximity to one another; and (2) offering a greater variety in type, design, and layout of residential and nonresidential land uses. The purpose of the "**MX**" and "**PD/TN**" duo is to connect people to memorable places in pedestrian-friendly interactive neighborhoods. [17]

In any approved "PD/TN" zone, the following residential development densities shall be implemented "as of right" on developable land within the zone:

- **Single Family Use:** at least 8 units/acre (1 unit/ 5,445 s.f.)
- **Two to Four-Family Use:** at least 12 units/acre (1 unit/ 3,630 s.f.)
- **Multi-Family Use**: at least 16 units/acre (1 unit/ 2,722 s.f.).

It is important to note that when a PD/TN overlay falls within a TIF District, the TIF Set Aside for affordable workforce housing specifies thresholds for affordable housing and maintains an escrow account to assist developers with gap financing.

Figure 7-13: MX & PD Zones



17 *A Legal Guide to Urban and Sustainable Development* by Daniel K. Slone and Doris S. Goldstein with Andrew Gowder Jr., John Wiley & Sons, Inc., Hoboken, New Jersey, 2008

"GN" Zone – (Green Neighborhood Zone)

The "**GN**" zone is an urban floating zone that evolves from land banking activity and the assembly of parcels that are prepared for conversion, either to parks or to green housing development. The site is cleared, mitigated and prepped for a "flexible future." The site can then evolve in stages starting with vacant open space, later morphing into low density residential development, or changing from passive to active recreation such as ball fields or water play.

Subdivision Regulations

RECOMMENDATION GR-5: *In areas where compact development using 1/8 acre lots is desirable, specify the following standard for block sizes:*

- *Block shall have an average length not exceeding 400 feet.*

In both the zoning ordinances and the subdivision regulations of all three regional counties, delete any references to **minimum** *lot size requirements, such as quarter acre or half acre lot-sizing. If deemed desirable, institute* **maximum** *lot size requirements in certain residential districts, such as 1/8 acre* **maximums**.

Green Buildings

RECOMMENDATION GR-6: *Adopt a local building ordinance, enforced by the local Building Commissioner and Code Enforcement Inspectors, requiring all municipally owned or occupied new construction and renovation projects over 5,000 square feet with a total construction cost of more than $250,000; and all new city-funded construction and renovation projects over 10,000 square feet with a total construction cost of $250,000 or more, to be LEED Silver certified, or its documented equivalent.*

Green Roofs

RECOMMENDATION GR-7: *Investigate state and federal grants available for applying green roofs to municipal buildings in Evansville, Henderson, Newburgh and Boonville. Buildings such as the Evansville Civic Center, Evansville-Vanderburgh Convention Centre, Victory Theatre, Central Library, Ford Center and along the Main Street Walkway in Evansville, plus public buildings and private structures along Main Street in Henderson are prime candidates for retrofitting with green roofs.*

Courtesy of Greenscreen

Metropolitan Land Bank

RECOMMENDATION WH-1: *The public sector can give strong encouragement and assistance to private development and neighborhood revitalization efforts by acquiring key properties, assimilating key development blocks, and preparing raw or reclaimed land for prime development in the private sector. The Evansville Brownfields Corporation has been active in the acquisition and transfer of properties in the Haynie's Corner area over the past several years. This organization actively seeks vacant and abandoned properties in the DMD focus area in order to remove blight and stabilize contiguous urban neighborhoods. The impact of their efforts to acquire underutilized parcels and demolish dilapidated buildings, as well as to rehabilitate structures, whenever and wherever possible, is evident in the emerging resurgence of the Haynie's Corner Art District. Addressing urban blight and establishing reuse strategies in older neighborhoods is critical to the sustainability and rebirth of the urban areas of the region.*

The Evansville Brownfields Corporation functions much like a land bank, but on a smaller scale. Land banks typically enhance the objectives of code enforcement, assist in the management of property tax delinquency, and facilitate development of adaptive reuse strategies. With expanded funding, additional staff, and changes in present Brownfields Corp. bylaws, the Evansville Brownfields Corporation could easily transform into a county-wide or even a two-county metropolitan land bank. These changes would allow the present entity to address blight in a much wider geographic area than it presently operates. A metropolitan land bank could assist with sustainable projects such as community gardens, urban orchards, regional parks and open space, and other sustainable community initiatives and assets. The ongoing, active functioning of a metropolitan land bank could help optimize quality of life and economic development, while preventing devaluation of residential properties going through challenges in older neighborhoods. The metropolitan land bank could become indispensable in helping grow the tax base by assembling contiguous properties for residential, commercial and mixed-use development. The City of Evansville and surrounding counties should explore the possibility of a Metropolitan Land Bank.

Incentives

RECOMMENDATION WH-2: *In designated Opportunity Areas and affordable housing target zones (see maps in Chapter 4), establish special developer incentives: streamlined approval procedures with fee waivers, tax abatement programs, building density bonuses and utility rebate programs, in order to motivate the private sector to provide affordable workforce housing. Designate eligible areas "residentially distressed areas," as defined in the Indiana Code, in order to implement certain tax abatement incentives.*

Zoning and Housing Affordability

RECOMMENDATION WH-3: *It is recommended that all three counties – Henderson, Warrick and Vanderburgh implement the following strategies to promote compact growth and meet the demand for workforce housing. For both infill development and new development at the urban fringe or corporate limits, these implementation tools and techniques will contribute to balanced, fiscally responsible growth in the three-county EMPO planning area. The present versions of the zoning ordinances and subdivision regulations in each of the three counties are based on older documents that, in many ways, have not kept up with the fast-paced changes in the environment and the land development arena. These instruments need updating to such a large degree that it makes the most sense to start over with completely new regulations. In the meantime, creation of Overlay Design Districts and Floating Zones outlined previously, in some of the key development areas, wherein these new tools and techniques can be tested to see what works for the particular geographies where they are applied, will be the recommended course of action.*

Workforce and Senior Housing Recommendations

1. *Revise the zoning ordinances in Vanderburgh, Warrick and Henderson Counties so they permit greater housing choice by permitting a much wider variety of housing types, including mixed use/work-live spaces, retail shops with loft housing above, row houses, cooperative housing and other innovative strategies.*

2. *Revise the zoning ordinances in the three-county area to allow accessory dwelling units in single family developments. These accessory dwelling units (ADU) include living spaces above garages, or in finished basements and attics, with separate entrances for elderly persons, adult singles, college students, or small families.*

3. *Adopt the* **Environment and Green Infrastructure Plan**, *in Chapter 5, that prioritizes open lands to be protected as opposed to those which could be available to development. According to the Green Infrastructure Working Group, green infrastructure is "the nation's natural life support system – a strategically planned and managed network of wilderness, parks, greenways, conservation easements, and working lands with conservation value. This network supports native species, maintains natural ecological processes, sustains air and water resources, and contributes to the health and quality of life for America's communities and people."* [18]

4. *After implementing the* **Environment and Green Infrastructure Plan**, *design and implement zoning categories, districts, and tools that are capable of preserving open space. A technique that has proven successful in other communities is the cluster development zone. The technique will allow the same amount of land development that is prescribed in the use categories of the zoning ordinance, but the cluster concept requires that the development is placed on only a portion of the parcel, at a more intense, higher density, thereby retaining the balance of the site as open space.*

5. *Implement a process to expedite plan and permit approval for balanced growth projects in Overlay Design Zones. A one-stop permitting process, using developer liaison personnel, along with priority review privileges, are ways the three counties can focus their zoning and platting resources on projects that are compact, green, multi-use/mixed use, and represent balanced growth and fair housing principles outlined in this Millennial Plan.*

6. *Display zoning concepts and desirable design standards and prototypes in graphic/pictorial fashion, on display in the Plan Commissions' offices, to foster better, clearer depiction of balanced growth and housing equity goals. Pictures help convey to builders, developers, and designers the precise, detailed examples of the types of projects that the community wishes to support and encourage. The information should also be available in electronic form at the Planning Commission's website.*

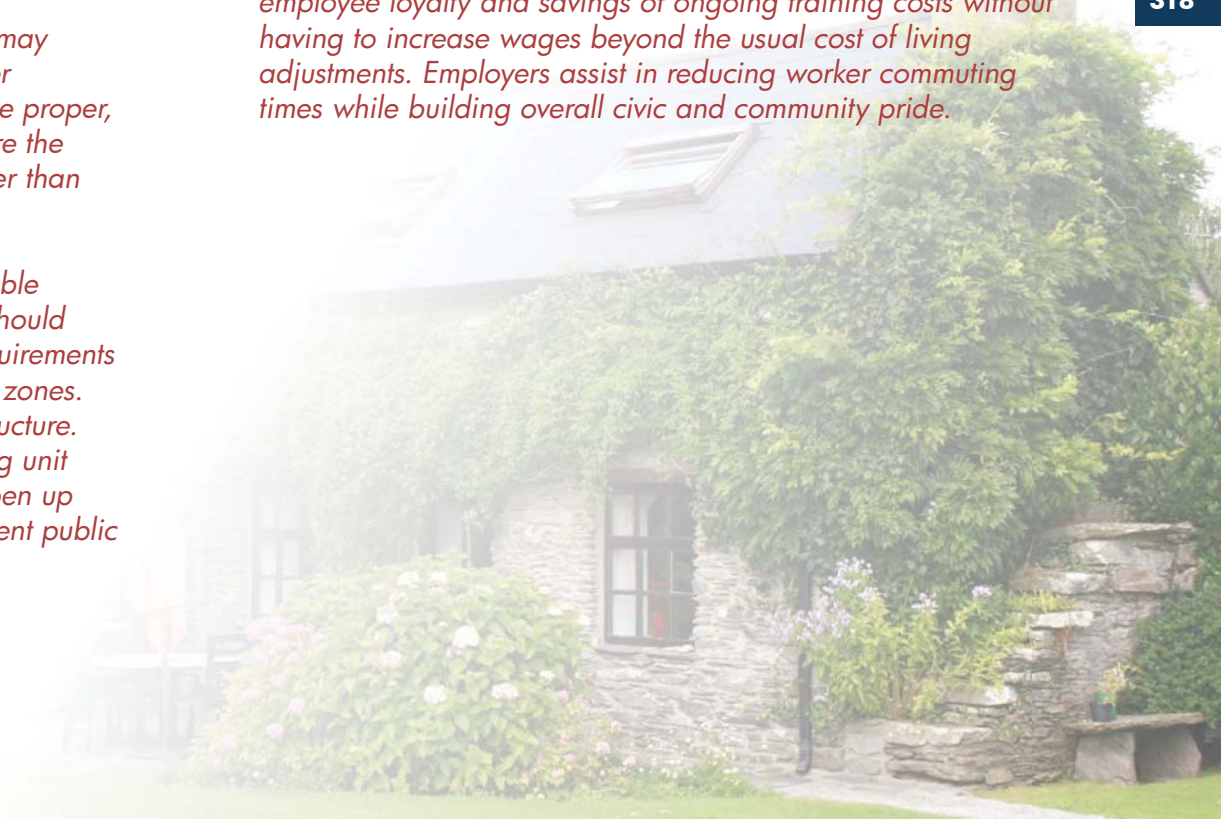
7. *Utilize "Floating Zones" to plan for undetermined land uses or functions within larger development areas. Zoning tools such as Planned Developments (PDs) and Overlay Zones (mentioned above) have resulted in a plethora of creative mixed-use projects in localities across the nation. Such tools are based predominantly on providing developers the flexibility to adjust to unforeseen opportunities or fluctuations in the marketplace, without having to completely re-apply or re-submit development plans. Floating Zones can give developers the leeway and luxury of forestalling key development decisions until the market timing is just right, resulting in more responsive development projects. The PUD ordinance for Vanderburgh County is outdated. Rather than providing flexibility for developers, it has become a highly inflexible tool that is rarely used. The PUD ordinances for all three adjacent counties should be revised, refined, and coordinated so that they foster and encourage creativity and "outside the box" thinking for neighborhood designs and community developments being provided by private sector developers. Transform them into PD zones.*

18 Green Infrastructure. www.greeninfrastructure.net/Intro/Mission-WorkingGroup.htm

8. *Consider the adoption of a* **Cottage Housing Development Zoning Ordinance** *component. Over the past five years since the onset of the so-called Great Recession, pent-up demand accompanied by changing demographics has made the cost of housing overly expensive for some citizens of the Vanderburgh, Warrick and Henderson County area. Often what is needed to address this growing social problem, without sacrificing the character of established neighborhoods, is an innovative approach such as "Cottage Housing." Cottages are time-honored icons of bygone eras that can be revived to serve modern needs. By creating what is called a cottage housing development (CHD) zoning ordinance, or sub-chapter within the present ordinance, another affordable housing strategy is implemented without untimely subsidies or federal red tape. Cottage houses are simple single-family detached units that are clustered onto smaller parcels of land without sacrificing the feel and character of detached housing neighborhoods. The CHD ordinance designates specific zones in the community where cottage housing may be constructed. Local design and zoning officials in other communities have worked with developers to arrive at the proper, most applicable densities and design amenities, to assure the cottages enhance communities and neighborhoods rather than detracting from them.*

9. *To facilitate wider housing choices and shore up affordable housing resources in the community, the three counties should evaluate the possibility of reducing minimum lot size requirements or removing them altogether in certain key development zones. Large lot zoning means more costs for extending infrastructure. Smaller lots, when efficiently planned for specific housing unit types, such as the cottage housing mentioned above, open up possibilities for more public park spaces and more efficient public services.*

10. *Establish an employer-assisted workforce housing program by having public jurisdictions partner with private companies in providing jobs close to affordable housing. Oftentimes individuals who work in entry-level jobs cannot find housing close to where they work. They often must choose between a long commute to work or moving to another community that has more affordable housing, which can also mean changing jobs. For example, in 2000, the Greater Minnesota Housing Fund (GMHF), created by the Twin Cities' Metropolitan Council, introduced some innovative models for matching housing supply with actual demand. The housing fund teamed with local companies to match down-payment assistance, to leverage financing, and to provide technical assistance for neighborhoods and employers interested in expanding their workforce housing supply while providing housing close to where the jobs are.* [19] *Employers can benefit from increased employee loyalty and savings of ongoing training costs without having to increase wages beyond the usual cost of living adjustments. Employers assist in reducing worker commuting times while building overall civic and community pride.*



19 Greater Minnesota Housing Fund, http://www.gmhf.com

Workforce and Senior Housing Recommendations

11. *Local governments have many options for promoting quality workforce housing (affordable housing in close proximity to employment opportunities). In the book called* Developing Housing for the Workforce: A Tool Kit, *(ULI – The Urban Land Institute, 2007) author R. Haughey lists six strategies local governments can utilize to incentivize workforce housing. These strategies are:*

    - *"**allowing** accessory apartments on single-family house lots;*
    - ***enacting** inclusionary zoning requirements that affordable homes be built along with market-rate housing;*
    - ***enacting** linkage requirements that workforce housing be provided in return for approval of offices or industrial facilities;*
    - ***offering** density bonuses in return for affordable units;*
    - ***donating or selling** municipal lands with workforce housing requirements; and*
    - ***creating** housing trust funds that earmark revenue from multiple sources for a community's housing needs."*

12. *Create Overlay Design Districts in selected TIF Districts so that Form-Based Code provisions can be applied to the TIF. Give these TIF Districts and other key places unique design guidelines that are appropriate for the development goals of the TIF and other special districts.*

Revolving Loan Fund

RECOMMENDATION WH-4: *Cities of Evansville and Henderson should consider developing a revolving loan funding, in partnership with local financial institutions, geared to rehabilitation and weatherization improvements in low-mod urban neighborhoods. Loans would be made to individual families in a City-Scale Energy Efficiency Retrofit Program.*

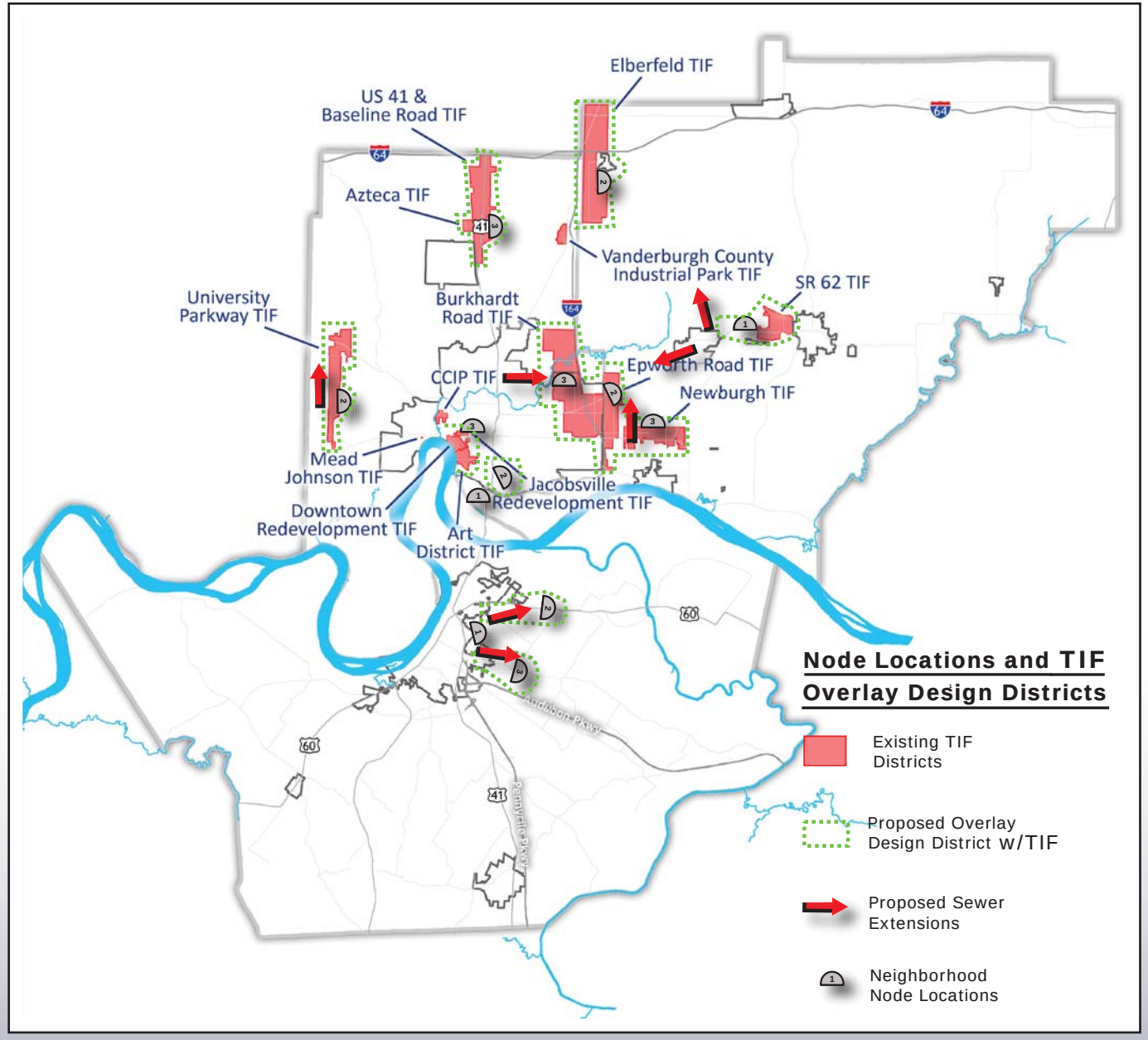
TIF Set Aside

RECOMMENDATION WH-5: *In all TIF Districts in Vanderburgh County and Warrick County implement, through legal ordinances, an Affordable Housing Set-Aside requirement. The Set-Aside requirement should comprise a Revolving Loan Fund to be used to provide gap financing and other incentives for private housing developers and/or not-for-profits. Require any multifamily developments proposed within a City of Evansville TIF District to have at least 5% of its units devoted to very low income households (30-60% of AMFI); and any multifamily developments proposed in a Vanderburgh or Warrick County TIF District to have at least 5% of its units devoted to low income families (50-80% of AMFI). Area Median Family Income (AMFI) can be determined using 2010 census tract information. These thresholds are to be verified, monitored, and enforced through a deed restriction or an enforceable contract with the Department of Metropolitan Development, or the Evansville Housing Authority, or a community development corporation or other community development agency. As the TIF District generates revenue, a predetermined percentage will be set aside in a special Revolving Loan Fund that will be used to aid in bringing developments that are financially marginal into full feasibility. Local elected officials and housing officers will devise criteria for the selection of viable funding for private or not-for-profit entities by using TIF set aside allocations.*

Opportunity Areas

RECOMMENDATION WH-6: *In designated Opportunity Areas and affordable housing target zones along bus transit routes, shown in Chapter 4, establish special developer incentives: streamlined approval procedures with fee waivers, tax abatement programs, and building density bonuses in order to motivate the private sector to provide affordable workforce housing. When multifamily developments in Vanderburgh County are located within established TIF Districts, financial incentives will be provided through the TIF District's revolving loan fund Set-Aside.*

Figure 7-14: Node Locations and TIF Overlay Design Districts



Environment and Green Infrastructure Recommendations

Air Quality Task Force

RECOMMENDATION GI-1: *The mayors of Evansville, Henderson, and Boonville, along with the Town Manager of Newburgh and the Town Board of Chandler, should engage with county officials, commissioners in Vanderburgh and Warrick Counties, and the County Judge Executive in Henderson, in order to identify, designate and appoint an* **Air Quality Task Force** *for the three county MPO area. The Air Quality Task Force should be headed by persons aware of the monitoring and compliance process, such as the Ozone Officer of the Vanderburgh County Health Department, and the Director of the Evansville-Vanderburgh County Regional Environmental Protection Agency. One of the Co-Chairmen should be from private business concerns such as Alcoa's Warrick Operation. Vectren and Municipal Power and Light of Henderson should also be represented. The Officers and Executive Committee should number from 5 – 9 persons. The entire Board of Directors could be comprised of as many as 30 persons.*

Solid Waste Audits

RECOMMENDATION GI-2: *The cities of Evansville, Henderson, and Boonville, along with the towns of Newburgh and Chandler, should collaborate in conducting waste audits, if they have not done so within the last five years, in order to assess magnitude of solid waste and to evaluate present programs and contracts for their waste handling operations. If auditing confirms national percentages for construction materials (20 percent) and organic materials (mostly garbage and food waste), the Solid Waste District of Vanderburgh County should explore the possibility of establishing a regional recycling center devoted strictly to construction waste handling and recycling. For organic food waste (commonly 10 percent of the waste stream), pilot programs with participating hospitals, schools, corporations with food service cafeterias, and nursing homes should be devised for local on-site composting of food waste generated in these institutional facilities.*

Wellhead Protection

RECOMMENDATION GI-3: *In order to benefit from a coordinated regional approach to water quality, to derive potential savings in fees, and to avoid duplications of services, communities in Warrick County that are dependent on groundwater should select a hydrological consulting company that can review the status of their Wellhead Protection Plans to determine if all state and federal regulations for the delineation of Wellhead Protection Areas are in compliance. The consultant should prepare a report that discusses the status of Wellhead Protection in Warrick County, complete with recommendations for the next steps the individual communities can take to either stay in compliance, or with remediation, come into full compliance. The professional consulting company should also be capable of suggesting appropriate controls or local ordinances to address Wellhead Protection by private developers. The synergies inherent in examining Wellhead Protection Plans together, all at once, to determine if there are overlapping strategies or unclassified areas, can mean cleaner groundwater and potential cost savings.*

Solar Farms

RECOMMENDATION GI-4: *As solar photovoltaic power reaches grid parity with non-renewable fossil fuels, Henderson Municipal Power and Light should investigate construction of a solar farm in the river bottoms east of Ellis Park, at a minimum of one (1) megawatt at the beginning. Vectren should, likewise, investigate potential sites in areas previously strip-mined in Warrick County. Power companies should devise a plan for regular expansion of the solar farm by phased sequencing, as power demands grow in the region. Regional power suppliers should also investigate joint ventures with one another to serve communities on both sides of the Ohio River with power derived from renewables. There are advantages in locating future Solar Farm developments in proximity to high voltage electrical transmission lines and regional transformers, in order to minimize development costs and save on line waste and distance complications.*

Green Infrastructure

RECOMMENDATION GI-5: *In all future neighborhood planning efforts, both public and private, utilize green infrastructure strategies throughout, both on public rights-of-way and on private property. Strategies should include rain gardens, bioswales, pervious pavements, and natural stormwater retention systems.*

Parks, Budgeting and Expenditures

RECOMMENDATION GI-6: *County and city governments in Vanderburgh, Warrick, and Henderson should develop strategies ensuring that parks and recreation facilities are funded at a minimum of $150 to $200 per capita annually, with a goal of bringing funding in line with national averages.*

RECOMMENDATION GI-7: *The City of Evansville should fund the Roberts Park project since it is a key urban open space and family recreation center. The City should also commit ongoing annual maintenance funding for the entire area, including the portions of the State Hospital grounds that the City of Evansville now owns.*

Tree Planting Guide

RECOMMENDATION GI-8: *Incorporated cities in the three county area, including Vanderburgh, Warrick and Henderson Counties, should set goals for planting trees in the most barren places within their downtowns. These incorporated downtowns should plan to increase the overall tree canopy within the urbanized city limits to 30 percent coverage. In Warrick County, in treeless strip-mined reclamation areas, plant trees for an average density of 300 trees per acre. Warrick County should set a target of 3,600 acres of newly forested lands. Finally, a worthy goal for the region, not counting reforestation of strip-mined reclamation lands, would be the planting of one thousand trees a year for the next 25 years, similar to the targets set by Louisville, Kentucky.*

Greenway Passage and Connectivity

RECOMMENDATION GI-9: *After updating its Bike and Pedestrian Master Plan, the Evansville region should expedite the completion of the entire Greenway Passage loop shown on the Greenway Passage Master Plan. Additionally, the region should implement connections between its schools, parks, libraries, and community centers in all three counties by implementing on-road trails and walkways totaling a minimum of* **100 linear miles**.

Linear Park

RECOMMENDATION GI-10: *The Lloyd Expressway, the major east-west artery through Evansville, should be developed using natural drainage-ways, and native plantings to form a linear park from USI to Evansville's west side commercial district.*

Urban Forests

RECOMMENDATION GI-11: *Work with INDOT to see that an assortment of native evergreen and native deciduous trees are planted in the center of the cloverleaves of the planned intersection of the Lloyd Expressway with Highway 41, at the epicenter of the metropolitan region. These trees should ultimately be dense enough to form an urban forest in this location.*

Complete Streets

RECOMMENDATION CS: *All regional localities should adopt Complete Streets ordinances requiring consideration of pedestrians and bicyclists in the design and construction of any new street or in the resurfacing or reconstruction of any previously existing street. The Evansville Metropolitan Planning Organization Policy Committee should continue to promulgate and implement its Complete Streets Policy, giving priority consideration to alternative modes of transportation in all project design and funding. Sidewalks and/or pedestrian trails should be required to be installed in all public and private developments.*

Pavement Management

RECOMMENDATION PM: *The Evansville Metropolitan Planning Organization should oversee the preparation of a Regional Pavement Management Plan and Implementation Process aimed at preserving existing street and road surfaces by emphasizing preventive maintenance.*

Bus Rapid Transit

RECOMMENDATION BRT-1: *Hire a transit planning consultant to conduct a Comprehensive Operations Analysis on the METS bus system in order to evaluate present routing, stops, and timing. Implement a dedicated Bus Rapid Transit lane and a continuous bicycle lane along Highway 41 from Toyota to downtown Henderson, Kentucky. The METS Comprehensive Operations Analysis (COA) should also examine the best east-west Rapid Bus Lines, studying options such as Lincoln Avenue or Covert Avenue into Newburgh (or a loop using both), Diamond Avenue, Lloyd Expressway from USI to downtown Evansville, and Oak Hill Road/Morgan Avenue to Chandler, Indiana.*

RECOMMENDATION BRT-2: *Implement the Highway 41 Bus Rapid Transit system in the following sequence.*

Stage 1: *Begin the Greening of US41 Corridor*

- *Tasks: improve pedestrian access at intersections along US41; construct bicycle trail along old rail line; plantings and trees along US41.*
- *Time Frame: 2014 to 2015*

Stage 2: *Shuttle between Henderson, Kentucky and Evansville, Indiana*

- *Tasks: develop an operations plan for a shuttle bus between Henderson and Evansville; obtain funding for the bus; implement shuttle bus.*
- *Time Frame: 2014 to 2016*

Stage 3: *Express bus service along US41 Corridor*

- *Tasks: build upon the existing bus service on US41 and develop an operations plan for express bus service along the US 41 corridor that could include stops in Henderson, Evansville, Vanderburgh County, Gibson County; the plan includes recommendations for revisions to METS and HART; obtain funding for the service; implement service.*
- *Time Frame: 2016 to 2020*

Stage 4: *Bus Rapid Transit along US41 Corridor*

- *Tasks: develop a plan for a Bus Rapid Transit system servicing Evansville, Henderson, and Warrick County that includes US41 as the north/south route and other possible rapid bus routes serving the Evansville east and west sides as well as portions of Warrick County; recommend changes to the Evansville Comprehensive Plan and Henderson Comprehensive Plan to provide for higher densities of development along US41; obtain funding for the US41 service; implement the service along US41.*
- *Time Frame: 2020 to 2025*

Stage 5: *Rapid bus service to other parts of Evansville and Warrick County*

- *Tasks: obtain funding for other portions of the rapid bus system; implement these additional services; work with city and county administrations to encourage higher densities along the US41 BRT corridor.*
- *Time Frame: 2025 to 2030*

Regional Transit Authority

RECOMMENDATION BRT-3: *The three counties of Vanderburgh, Warrick, and Henderson, with the help of the Evansville Metropolitan Planning Organization, should discuss, investigate and research the possibilities for a* **Regional Transit Authority** *that would have jurisdiction in the three-county EMPO area. The Transit Authority would be charged with investigating the possibilities for a regional BRT and rapid bus system, and for further linkages between the three individual bus systems operating in the three counties.*

Car-Share and Bike-Share

RECOMMENDATION BRT-4: *Once a Regional Transit Authority has been created, the new Authority should take a serious look at* **Car-Share** *and* **Bike-Share** *systems Best Practices from other communities to determine approximate costs for establishing Car-Share or Ride-Share systems to supplement the planned Bus Rapid Transit system. The Car-Share and Bike-Share systems would aid BRT riders in getting from BRT stops to places of employment, recreation, or shopping and back again. The private sector should also get involved with the process by implementing a series of "bike depots," having a wide variety of bikes to rent for short periods to enhance connectivity.*

Economic Development Recommendations

Warrick Health Care District

RECOMMENDATION ED-1: *Warrick County should classify the Epworth Road and Highway 66 Health Care Park an Innovation District and should petition the Warrick County Plan Commission to formulate the district as an overlay design district, overlaid on the existing zoning. Innovation Districts imply special design requirements and Form-Based Code implications in order to achieve the desired scope, scale and character of the district regarding building siting, parking configuration, landscape features, lighting engineering, and signage standards.*

Founder Town

RECOMMENDATION ED-2: *The Growth Alliance for Greater Evansville, in cooperation with the University of Southern Indiana, working with the Evansville Metropolitan Planning Organization (EMPO) and the Evansville-Vanderburgh County Area Plan Commission should collaborate to define site boundaries and classify the Applied Technology Park and Business Accelerator an Innovation District. The APC should retain professional planning, design, and legal services to formulate the district as an overlay to the pre-existing zoning. The Evansville-Vanderburgh County Area Plan Commission should also take the lead in specifying design and engineering standards for future development along University Parkway. Specifications should include frontage road design, intersection design, grade separation applications, buffer and landscaping standards, signage guidelines, and suggested land uses.*

Henderson Convention and Entertainment Zone

RECOMMENDATION ED-3: *Once the determination is made by the City of Henderson, as to the fate of the old coal-fired power plant on the riverfront, Henderson Municipal Power and Light Plant (HMPL #1), a special Innovation District should be implemented in downtown Henderson, on the riverfront. The River City Renaissance (RCR) group and involved local architects should help the Plan Commission formulate the district as an overlay to the existing zoning. Innovation Districts imply special design requirements and Form-Based Code implications in order to achieve the desired scope, scale and character of the district with regard to building siting, parking configuration, landscape features, lighting engineering, and signage standards.*

Slackwater Harbor

RECOMMENDATION ED-4: *The City of Evansville and Vanderburgh County should assemble a Port Working Group made up of engineers, developers, public officials, accountants, attorneys, and architects to pursue the possibilities for a new Slackwater Harbor; a direct and unencumbered truck route from the Howell Railroad Yard to the Lloyd Expressway; and approximate cost estimates to prepare the sand and gravel yard for development. The Working Group should file a report outlining its findings and its recommendations for next steps and begin establishing communication with the US Army Corps of Engineers.*

Regional Food Hubs

RECOMMENDATION ED-5: *The City of Henderson, Kentucky, through the new East End Development Corporation, should collaborate to form an urban Regional Food Hub in the East End of Henderson. Vanderburgh County, in cooperation with the Welborn Baptist Foundation, should collaborate to form a rural Regional Food Hub in northern Vanderburgh County on North Highway 41. Once these new Food Hubs are well-established, they may elect to form a Food Cooperative with membership throughout western Kentucky and southern Indiana, in order to capitalize on economies of scale. An on-line tool allowing farmers to swiftly identify potential buyers will be a must. The software should be reasonably priced and easy to use.*

Village Earth

RECOMMENDATION ED-6: *The Warrick County Commissioners should collaborate with the development team for Village Earth by offering development incentives and assistance with grant applications to state and federal agencies. The Commissioners should also examine the county's tax structure and bonding capacity to determine the level of financial involvement Warrick County can muster, in order to move this key economic development project forward.*

Regional Leadership Roundtable

RECOMMENDATION ED-7: *In order to promote a regional approach to governing and public policy, as well as to advance the vision of this Millennial Plan for 2040, the Sustainable Evansville Area Coalition Steering Committee, made up of elected officials from communities including Boonville, Evansville, Newburgh, and Henderson, plus elected county officials from the three regional counties of Henderson, Vanderburgh and Warrick counties, along with various key consortium members will continue to guide the Evansville Metropolitan Planning Organization in carrying out the intended plans and policies of the Millennial Plan for 2040. The Regional Leadership Roundtable may add certain consultants and agency directors, from time to time, as it sees fit, in order to stay on course for a Sustainable Region. Ultimately, a paid, qualified, professional Executive Director may be desirable, in order to conduct the daily business of the Regional Leadership Roundtable.*

Implementation Matrix

The following matrix constitutes a listing of all of the final recommendations included in Volume 2 of the Regional Plan for Sustainable Development. After restating the recommendation as it was originally presented, the matrix goes on to list the entities that will be most heavily and visibly involved in the implementation of the recommendation. The next column outlines funding sources and a financial plan for final implementation. The last column establishes the relative time line.

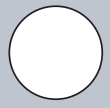
In reviewing the experience of other cities in funding sustainability strategies, it appears that there are typically four avenues of funding that are being pursued:

- Local government funding such as city or county funds that have been used for area plan commissions and other offices;
- Funding through MPOs that could be planning funds or funds for bicycle, transit, pedestrian projects;
- Funding through housing authorities that could be used for workforce housing; and
- Funding through foundations. It should be noted that a wide variety of foundations are investing in sustainable projects for smart growth, nationally, including small community foundations, large independent foundations and corporate charities. Many of these funders are focusing their investments in transportation and land use reform projects such as transit-oriented development.

The time frame for each recommendation is indicated by the following symbols:

Short Term
(1-5 Years)

Medium Term
(5-10 Years)



Long Term
(10+ Years)

Implementation Matrix

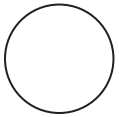
Growth & Revitalization

Recommendation	Implementation Strategy	Implementing Body - Lead Cit./Co. Departmts. Key Partner Groups	Funding Sources and Financial Plans	Time Frame
Growth & Revitalization				
GR-1	**Parking Requirements in Zoning Ordinances -- Lowering Minimums**	Plan Commissions and Elected County Officials from Vanderburgh, Warrick and Henderson Counties	Plan Commissions' & counties' general operating funds	
GR-2	**Infill Priorities**	Plan Commissions from Vanderburgh, Warrick and Henderson Counties	No additional funding required	
GR-3 (a-e)	**Comprehensive Plan Policies**	Plan Commissions' latest update to their Comprehensive Plans	No additional funding required -- Seek Challenge Grant	
GR-3 f	**PUD Ordinance**	Plan Commissions from 3 counties to retain consultant to draft new PD -- Seek Challenge Grant	City-County combined from operating funds approximate grand total = $25,000 per ordinance	
GR-3 g	**Development Incentives**	Plan Commissions and Elected County Officials from three counties	Tax Increment Financing, Tax Abatement, GO Bond, EDA Grant, Indiana Econ. Dev. Corp.	
GR-3 h	**Impact Fees**	County Assessors, County Commissioners, and County Judge Executive	Administrative costs only- Potential added revenue source	
GR-3 i	**Sewer and Water Extensions**	City and county engineers, water districts, utilities, and county officials	Budgeted capital improvements or TIF public investments	
GR-3 j	**Annexation Guidelines**	City officials including tax assessor, city clerk, city engineers, mayors	Administrative costs plus cost of specific capital improvements required	
GR-4	**Zoning Overlay Design Districts**	Plan Commissions from 3 counties to retain consultant to draft and detail new overlay districts	City-County combined from operating funds approximate grand total $150,000 (for 3 counties)	

Recommendation	Implementation Strategy	Implementing Body - Lead Cit./Co. Departmts. Key Partner Groups	Funding Sources and Financial Plans	Time Frame
Growth & Revitalization				
GR-5	**Standard Block Sizes**	Plan Commission from 3 counties to retain consultant to draft and detail new subdivision provisions	City-County combined from operating funds approximate grand total $15,000 per county	
GR-6	**LEED Certification for Public Buildings**	City-County attorneys and public officials retain real estate attorney & architect	$35,000 per building as up front cost -- Seek payback time of no more than 10 years	
GR-7	**Green Roofs**	Grants from Indiana State Departments of Energy, Federal EPA and Federal Department of Energy	$11.00 per square foot plus 5.50 per lineal foot for roof edging Payback ≤ 10 years	

 **Short Term** (1-5 Years)

 **Medium Term** (5-10 Years)

 **Long Term** (10+ Years)

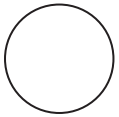
Workforce and Senior Housing

Recommendation	Implementation Strategy	Implementing Body - Lead Cit./Co. Departmts. Key Partner Groups	Funding Sources and Financial Plans	Time Frame
Workforce and Senior Housing				
WH-1	**Metropolitan Land Bank**	Joint 3 county land banks formed from original Brownfields, Inc. -- Seek Foundation support	Staffing and offices = $250,000 annually plus $500,000 initial seed funds for property acquisition	
WH-2	**Developer Incentives**	Administrative review of approval process in each county, with ordinance changes by county attornies	Site Review -- procedural changes at no added cost Waiving of permitting fees Streamlining of approvals	
WH-3a	**Zoning for Mixed Use**	Zoning ordinance changes to be devised as per GR-3f, GR-4, and GR-5 above	See costs outlined above in GR-3f, GR-4, and GR-5	
WH-3b	**Accessory Dwelling Units**	Zoning ordinance changes to allow these dwellings - by lawyer & architect consultant	$15,000 per county Add to total above in GR-3f, GR-4, GR-5	
WH-3c	**Land Conservation using RP Overlay Design Districts**	Plan Commissions from 3 Counties to retain consultant to draft and detail new overlay districts	See GR-4 above -- no additional consultant fees required beyond those shown in GR-3f, GR-4, and GR-5	
WH-3d	**Open Space Preservation using the Cluster Concept**	Plan Commissions from 3 Counties to retain consultant to draft and detail new overlay districts	See GR-4 above -- no additional consultant fees required beyond those shown in GR-3f, GR-4, and GR-5	
WH-3e	**Balanced Growth**	Same as WH-2 above	same as WH-2 above - no additional costs	
WH-3f	**Graphic Zoning Displays**	Plan Commissions to retain planning consultants to provide graphics	approximate cost of services and deliverables = $40,000	
WH-3g	**Floating Zones and PDs**	Plan Commissions from 3 counties to retain consul-tant to draft new PD	Same as GR-3f above - No additional costs required	

Recommendation	Implementation Strategy	Implementing Body - Lead Cit./Co. Departmts. Key Partner Groups	Funding Sources and Financial Plans	Time Frame
Workforce and Senior Housing				
WH-3h	**Cottage Housing Ordinance**	Plan Commissions from 3 counties to retain consultant to draft cottage ordin.	Included as part of services in WH-3b above	
WH-3i	**Minimum Lot Sizes**	Plan Commissions from 3 counties to retain consultant to draft min. lot size	Included as part of services in WH-3b above	
WH-3j	**Employer Sponsored Workforce Housing**	DMD in Evansville and Community Development office in Henderson	Initial seed funding of $15,000 per county, plus private equity investment	
WH-3k	**Workforce Housing Development Toolkit**	DMD in Evansville and Community Development office in Henderson	HUD, IHCDA, Federal Home Loan Bank, LIHTC, CDBG, HOME, TIF Set-Aside Fund	
WH-3l	**Workforce Housing In TIF Districts**	Plan Commissions from 3 counties to retain consultant to draft overlays	GR-4 consultant cost covers consultant expenses Kentucky Housing Corp.	
WH-4	**Revolving Loan Fund with help from HUD, DOE, Vectren, CAPE, Henderson Power and Light**	Evansville DMD and Henderson Community Development Office teamed with local Banks and Savings & Loans and Energy Companies	$500,000 available for financing low-mod families with weatherization and renovation funding Energy Payback ≤ 10 Years	
WH-5	**Affordable Housing TIF Set-Aside**	County officials in Vanderburgh and Warrick Counties - w/ legal and accounting consultants	Accrual over time - No initial funding required other consulting fees - fee estimate is approximately $15,000	
WH-6	**Workforce Housing Opportunity Areas**	City and County officials in all 3 counties - plus housing officials for implementation	No additional costs needed beyond those outlined in items GR-3g, WH-2, WH-3	

 **Short Term** (1-5 Years)

 **Medium Term** (5-10 Years)

 **Long Term** (10+ Years)

Implementation Matrix

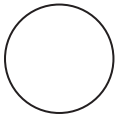
Environment and Green Infrastructure

Recommendation	Implementation Strategy	Implementing Body - Lead Cit./Co. Departmts. Key Partner Groups	Funding Sources and Financial Plans	Time Frame
Environment and Green Infrastructure				
GI-1	**Air Quality Task Force**	City and County officials from all 3 counties Evansville Metropolitan Planning Organization	Establish a printing and events budget split 3 ways for the 3 counties - budget estimate is $24,000 annually	
GI-2	**Solid Waste Audits**	Evansville, Henderson, Boonville, Chandler & Newburgh collaborate on waste audit	Utilize university (student & professor assistance) on the waste audit	
GI-3	**Regional Wellhead Protection Areas**	Water providers in Boonville, Campbellsville, Chandler, Yankeetown, and Reo should collaborate on wellheads	Consultant cost total is estimated to be approx. $35,000	
GI-4	**Regional Solar Farms**	Vectren and Henderson Municipal Power & Light and Development Partner	Start with DOE or DOE/ Indiana Demonstration Grant	
GI-5	**Green Drainage Strategies**	EMPO, DMD, Evansville Water and Sewer Dept., Evansville Transportation & Engineering Department	Implement through CSO Consent Decree; DMD to include in all future neighborhood plans	
GI-6	**Per Capita Parks and Open Space Expenditures**	County and city officials and their budgets for Parks and Recreation expenditures	Approximately $50.00 per capita annually in addition to present spending levels	
GI-7	**Roberts Park Funding**	Evansville City Council and Evansville Parks and Recreation Department	Fund Roberts Park initially at a level of $1 million and add funding for overpass	
GI-8	**Tree Planting Goals, Teaming with Keep Evansville Beautiful and National Arbor Day festivities**	Vanderburgh, Warrick and Henderson Counties, plus Cities of Evansville, Boonville, and Henderson	Request a tree planting fund of $1 million from DNR, plus $50,000 total for 25 years of local urban planting	
GI-9	**Bike and Pedestrian & Greenway Passage Extension**	City of Evansville and Vanderburgh County plus Trails Coalition and Parks Dept.	INDOT, EMPO, FTA, IDNR, Welborn Foundation, Lily grant	

Recommendation	Implementation Strategy	Implementing Body - Lead Cit./Co. Departmts. Key Partner Groups	Funding Sources and Financial Plans	Time Frame
Environment and Green Infrastructure				
GI-10	**Linear Park Along West Lloyd Expressway**	City of Evansville and Vanderburgh County plus USI and local westside business	Donations of rights-of-way plus annual maintenance costs for no net added cost - Naming & Sponsoring options	
GI-11	**Lloyd Cloverleaf Plantings**	INDOT in partnership with the City of Evansville	Trees at $2,000 each, provided by INDOT -- KEB as watchdog	

Short Term
(1-5 Years)

Medium Term
(5-10 Years)



Long Term
(10+ Years)

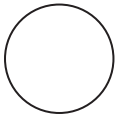
Economic Development Initiatives

Recommendation	Implementation Strategy	Implementing Body - Lead Cit./Co. Departmts. Key Partner Groups	Funding Sources and Financial Plans	Time Frame
Economic Development Initiatives				
CS	**Complete Streets**	EMPO and the three counties in EMPO's regional area of influence, including city and county engineers/consultants	Future street programs, street and road diets, and major improvement projects -- federal funding DOT, FTA, FHA	
PM	**Pavement Management**	EMPO and the three counties in EMPO's regional area of influence, including city and county engineers/consultants	Budget within the Transportation Improvements Program for annually budgeted preventive maintenance	
BRT-1	**Comprehensive Operations Analysis of Regional Transit**	EMPO and the three counties in EMPO's regional area of influence working with transit planning consultant	Total costs for the COA plus the BRT analysis is approximately $175,000	
BRT-2	**BRT Implementation Schedule**	EMPO and the three counties in EMPO's regional area of influence with Federal Transit Administration help	Implement through federal street, road and highway budgeting and funding, plus FTA grants	
BRT-3	**Regional Transit Authority**	EMPO and the three counties in EMPO's regional area of influence	Set up staffing, offices, and operating budget -- first year funding at $375,000	
BRT-4	**Car-Share & Ride-Share EMPO Oversight**	Private Enterprise plus grant funding from Foundations such as Welborn Baptist	Costs vary as to number of stations, bikes or vehicles and depends on funding sources	
ED-1	**Warrick Healthcare District**	Area Plan Commission and Warrick County Commission with Planning Consultant	Setting up District using Form Based Code - Consultant estimated cost is $50,000 ea.	
ED-2	**Founder Town with USI and GAGE**	Area Plan Commission and Vanderburgh County Commission with Consultant	Setting up District using Form Based Code - Consultant estimated cost is $50,000 ea.	
ED-3	**Henderson Convention & Entertainment Zone**	Plan Commission and Henderson City and County officials with Consultant	Setting up District using Form Based Code - Consultant estimated cost is $50,000 ea.	

Recommendation	Implementation Strategy	Implementing Body - Lead Cit./Co. Departmts. Key Partner Groups	Funding Sources and Financial Plans	Time Frame
Economic Development Initiatives				
ED-4	**Slackwater Harbor & Riverfront Redevelopment**	Corps of Engineers and City of Evansville Working Group; Redevelopment Commission & Board of Public Works	Estimated cost for readying sites for development to be determined after further input and study	
ED-5	**Regional Food Hubs**	Cannot be estimated at this time. Further study required. Retain Ken Meter, consultant	Consulting fees for Ken Meter to study all three counties Retained by Welborn Founda.	
ED-6	**Village Earth**	Funding through bonding and public commitment in a public/private partnership	Total project costs are estimated at $120 million with soft costs of $30 million	
ED-7	**Regional Leadership Roundtable Facilitated by EMPO**	Operate for 5 years without a paid Executive Director -- EMPO to coordinate	In the 6th year, all jurisdictions collaborate for Executive Director salary $72,000	

 **Short Term** (1-5 Years)

 **Medium Term** (5-10 Years)

 **Long Term** (10+ Years)

Thank You

We gratefully acknowledge the advice and assistance given us from all sectors of the wider community. The mayors and managers of the cities and towns in our three-county regional area have been accessible and wise in their counsel with us. In addition, the County Commissioners in Indiana and the magistrates and County Judge Executive in Henderson County have been of immeasurable value in helping us to understand key community issues and the culture of the region. Our consortium and technical committees worked tirelessly throughout the process. They are listed in the Appendices (Volume 5) of this report. Stephen Cerny, from the US Department of Housing and Urban Development, and his colleagues from DOT and EPA provided steady, regular review, comment and sage advice on the progress of the Plan.

Special thanks go to the following groups and individuals who contributed to the final Plan. Dona Bergman, Director of Sustainability, Energy and Environmental Quality for the City of Evansville and Dr. J.M. Alexandrovich, Vanderburgh County Health Department Ozone Officer helped author the sections in Volume 1, Chapter 3 on Air Quality, and gave advice on the Air Quality Task Force. The narrative on the Greenway Passage and bikeway corridors were developed in direct communication with Roberta Heiman and Drew Hayes of the Evansville-area Trails Coalition. Roberta and Drew are passionate about trails and bikeways and they inspired the Greening Plans in Volume 2, Chapter 5. Lynn Miller-Pease, Executive Director of Leadership Evansville, gave thorough input and guidance on the public participation process. Robert Sears and Chase Kelley from Vectren assisted with the gas and electric, alternative energy, and smart grid sections. Melodie Shrader and Bob Seymore provided leadership, vision, and encouragement for the Henderson East End Plan. Brad Schneider, Executive Director of the Henderson Chamber of Commerce, has assisted in numerous ways, with advice and direction, contacts and connections. Andrea Hays of the Welborn Baptist Foundation contributed to work on Food Hubs and Bike-Share systems. Economic Development directors including Debbie Dewey, Greg Wathen, and Larry Taylor provided great insights for the economic development initiatives outlined in the final report. The planners from the Planning Commissions in all three counties contributed their ideas to this effort and as they start the process of updating their own comprehensive plans, we hope they will keep this report in mind.

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