# INFUSION:
## CATALYZING PROGRESSIVE DESIGN STRATEGIES IN THE KNOBTOWN DISTRICT

by

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A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

DEPARTMENT OF LANDSCAPE ARCHITECTURE, REGIONAL AND COMMUNITY PLANNING
COLLEGE OF ARCHITECTURE, PLANNING, AND DESIGN

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2012

Approved by:

Major Professor
Blake Belanger, RLA, ASLA

## Abstract

Sustainable landscape design is generally understood in relation to three principles—ecological health, social justice, and economic prosperity. However, people have neglected to recognize the significance of their impact on the environment. The real conflict begins to address our relationship with the environment and how we attempt to reconnect and reverse centuries of environmental degradation. As a society, we lie at the intersection of the past and the future, presenting us the opportunity to think organically. Harboring values much different from post-industrial thinking, organic values work with nature rather than against it. However, most contemporary processes are not organic in nature. Rather they are products of our isolated way of thinking; a limited form of consciousness that arrogantly declares that we are the greatest intelligence on Earth. This consciousness has taught us that for our survival, it is our duty to subdue nature, relating to it as a resource for implementing how and what our minds invent. We have learned to relate to nature as a commodity rather than respect it as our community. *Infusion* seeks to establish this connection by creating a Transit-Oriented Development in the Knobtown District that uses the power of aesthetics to promote and inspire educational exploration, cultural expression, and ethical revelation of sustainable design.

Supporting this solution is a four-part foundational framework that identifies specific design principles that are envisioned to improve the way we relate to our environment through aesthetic eminence educational exploration, cultural expression and ethical revelation. The conceptualized framework is structured to be adaptable for many design situations becoming a foundation for the way in which we design and interact with form and space. In its final state, *Infusion* communicates the significance of these essential design principles and how the new Knobtown District can become an important part of the Rock Island Corridor.

# Infusion:

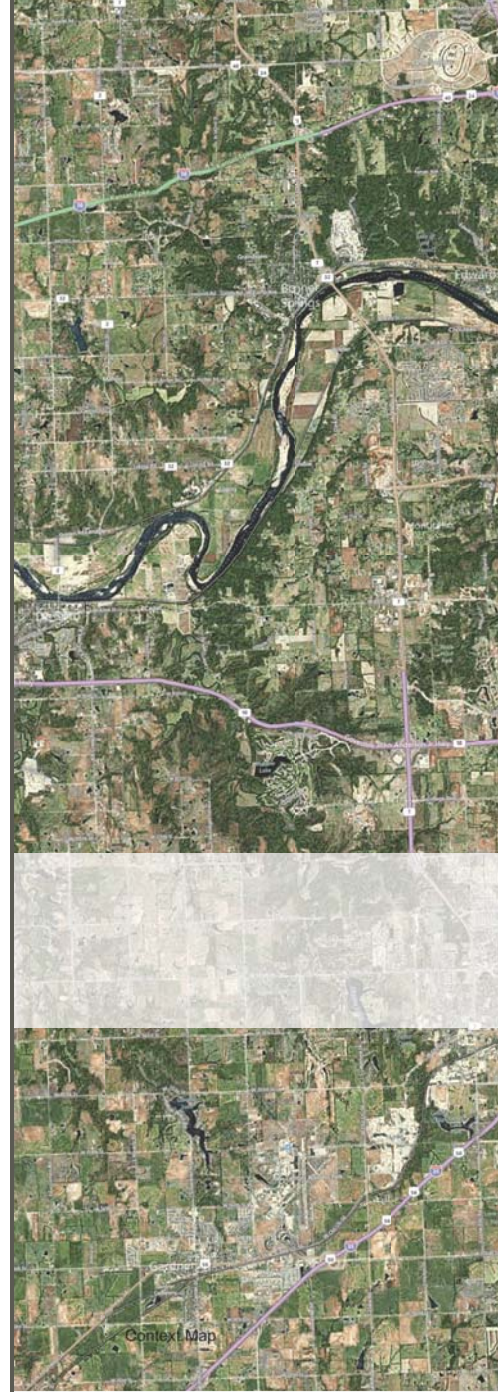## Catalyzing progressive design strategies for the Knobtown District

# Infusion:

**Catalyzing progressive design strategies for the Knobtown District**

Zachary Scott O'Keefe

Master's Project and Report

Spring 2012

Department of Landscape Architecture / Regional and Community Planning

College of Architecture, Planning and Design

Kansas State University

LAR 700 | Master's Project and Report

LAR 704 | Environmental Landscape Planning and Design

Context Map

Knobtown District

Blue Valley Study Area

Rock Island Corridor

# Infusion:

## Catalyzing Progressive Design Strategies for the Knobtown District

Zachary O'Keefe   |   Kansas State University   |   Masters of Landscape Architecture

# Copyright

## Acknowledgements.

*for my family, Victoria and for my friends;*
*thank you for your love, support, and*
*encouragement throughout this journey.*

# Abstract.

Sustainable landscape design is generally understood in relation to three principles—ecological health, social justice, and economic prosperity. However, people have neglected to recognize the significance of their impact on the environment. The real conflict begins to address our relationship with the environment and how we attempt to reconnect and reverse centuries of environmental degradation. As a society, we lie at the intersection of the past and the future, presenting us the opportunity to think organically. Harboring values much different from post-industrial thinking, organic values work with nature rather than against it. However, most contemporary processes are not organic in nature. Rather they are products of our isolated way of thinking; a limited form of consciousness that arrogantly declares that we are the greatest intelligence on Earth. This consciousness has taught us that for our survival, it is our duty to subdue nature, relating to it as a resource for implementing how and what our minds invent. We have learned to relate to nature as a commodity rather than respect it as our community. *Infusion* seeks to establish this connection by creating a Transit-Oriented Development in the Knobtown District that uses the power of aesthetics to promote and inspire educational exploration, cultural expression, and ethical revelation of sustainable design.

Supporting this solution is a four-part foundational framework that identifies specific design principles that are envisioned to improve the way we relate to our environment through aesthetic eminence educational exploration, cultural expression and ethical revelation. The conceptualized framework is structured to be adaptable for many design situations becoming a foundation for the way in which we design and interact with form and space. In its final state, *Infusion* communicates the significance of these essential design principles and how the new Knobtown District can become an important part of the Rock Island Corridor.

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This chapter introduces the expectations of the master's report and the process that has been taken. It also introduces the personal goals for the project and explains the integration of the project with the Mid-America Regional Council (MARC) and two key pieces of literature, Elizabeth Meyer's Sustaining Beauty- The Performance of Appearance: A Manifesto in Three Parts and the Knobtown Land Use and Development Plan.

# Master's Report Expectations.

The master's project and report is designed to allow students to explore personal interests, design philosophies, and theory in an academic setting. This process is intended to enrich student development as aspiring landscape architectural professionals.

The Master's Project and Report is organized into two segments [fall 2011 semester + spring 2012 semester] that allow students to undertake an independent project that addresses dilemmas within the the realm of contemporary landscape architecture. The first semester provides students the opportunity to explore theory, research, and the process and methodology informing future development and design solutions. The second semester becomes the manifestation of the process, research, and development in the form of planning and design solutions that appropriately address the goals, objectives, and dilemmas of the site and its context.

The students are expected to take leadership of their project in a way that exhibits their understanding of the design process. Not only should the student perform at a professional level, but work must explore the culmination of their five year academic experience. This provides the opportunity for the student to apply themselves creatively, addressing societal issues relating to ecological health, social justice, and economic prosperity. The final design solution should appropriately demonstrate the student's understanding of the circumstances in a way that emphasizes critical thinking, and written, graphic, and oral presentations.

## Personal Goals and Objectives.

**01.** Explore theory in landscape architecture, helping to inform the design process and future development of design solutions.

**02.** Develop a framework for sustainability based on four guiding principles; **aesthetic eminence**, **educational exploration**, **cultural expression**, and **ethical revelation**.

**03.** Influence others in the perception of nature, using the landscape as a device that not only supports our needs, but also provides visitors with the opportunity to be stimulated, educationally, culturally, and ethically.

**04.** Identify project goals and principles that can help to expand on the definition of sustainability.

**05.** Apply previous knowledge and skills from past studies and academic experiences to inform design opportunities and solutions.

**06.** Design a centralized transit hub that provides a sustainable place for families and businesses to coallesce in an environment that provides opportunites to interact.

# Design Approach.

In efforts to work at maximum efficiency throughout the duration of my master's report, a systematic design process is vital. The framework diagrams each step I take throughout the design process. The abstracted design approach *[Figure 1.1]* is understood as a process that involves cycling and refinement of every design stage. As a series, each step leads to the development and refinement of the goals at the beginning stages of the project development. *Figure 1.2* illustrates the tasks that have taken place throughout this academic exploration. As I have scheduled my time appropriately, I have taken into consideration the depth, complexity and importance of multi-tasking between project deadlines.

[1.1]

[1.2]

Tuesday September 6
Tuesday September 27
Tuesday October 4
Tuesday October 25
Tuesday November 15
Thanksgiving Break
Tuesday December 8
New Years !!!
Trip to Denver Trip to Denver Trip to Denver Trip to Denver Trip to Denver Trip to Denver
January 17
February 18-17
Mid-Crits :: Mid-Crits :: Mid-Crits :: Mid-Crits :: Mid-Crits :: Mid-Crits ::
March 16
March 26-27
April 2-3
April 9
April 16-20

Final Document Final Document Final Document Final Document
Meeting with MARC
Meeting with MARC
Meeting with MARC

Meeting with MARC

Final Ballot due + upload ETDR

September
October
November
December
January
February
March
April

Winter Break

GOALS
OBJECTIVES
STORYBOARD
DOCUMENT DESIGN

**Figure 1.1: Design Process.** My design process is a series of stages working in a cyclical manner providing the opportunity for development and refinement.

**Figure 1.2: Time + Tasks.** A timeline was created to identify key deadlines and provide structure for my design process.

## Literature Map.

The literature map, represents the process and linkages between literature throughout the project's development. Each component represents a key principle in the design of Transit-Oriented Developments. Within each node, are key terms that can be used to relate the identified principles back to the literature. The interior circle begins to identify the larger connections between not only the literature, but also how each key principle can be used to supplement others, developing a strong foundation of key goals and objectives to be attained. Throughout the Master's Report, literature is referred to helping to inform key design decisions. Ultimately, each of these aspects will help to unveil sustainable design solutions that will serve the greater Kansas City region.

_005

Echols, S., and Pennypacker, E., "Stormwater as an Amenity: The Application of Artful Rainwater Design."

McBee, Susanna. "Downtown Development Handbook. Second Edition."

Birgit Cold, "Aesthetics, Well-being, and Health," in Aesthetics, Well-being, and Health: Essays within architecture and environmental ethics.

Meyer, Elizabeth. 2008. "Sustaining Beauty- the Performance of Appearance: A Manifesto in Three Parts."

Meyer, Elizabeth. "Slow Landscapes: A New Erotics of Sustainability"

Kim Dovey, "The Aesthetics of Place," in Aesthetics, Well-being, and Health: Essays within architecture and environmental ethics.

**AESTHETICeminence**

Demonstration
*Aesthetics*
**Educational +
Interpretive**
**INSPIRE**

Meyer, Elizabeth. "Sustaining Beauty- The Performance of Appearance: A Manifesto in Three Parts."

Nikos Papastergiadis, "Hybridity and Ambivalence: Places and Flows in Contemporary Art and Culture." Theory, Culture, and Society

Philip H. Lewis, Jr., "Chapter 2: An integrated Ethic," in Tomorrow by Design: A Regional Design Process for Sustainability."

Sterling, Stephen. "Sustainable Education: Re-visioning Learning and Change."

McBee, Susanna. "Downtown Development Handbook. Second Edition"

Echols, S., and Pennypacker, E., "Stormwater as an Amenity: The Application of Artful Rainwater Design."

educational exploration : educational exploration : educational exploration : educational exploration : educational exploration

**Educate**

**Increase +
Enhance Wildlife**
Conservation
Design

[1.3]

the ability to meet the needs of present day systems [environmental, economic, social, cultural] while projecting a working framework into the future that preserves viable resources, systems, and other necessities that are necessary for our existence.

**sustainability**

**ethical revelation**

**educational exploration**

**aesthetic eminence**

cultural expression

Meyer, Elizabeth. "Slow Landscapes: A New Erotics of Sustainability"

Meyer, Elizabeth. "Sustaining Beauty- The Performance of Appearance: A Manifesto in Three Parts."

Mark J. Stern and Susan C. Seifert. "Cultural Clusters: The Implications of Cultural Assets Agglomeration for Neighborhood Revitalization."

Nikos Papastergiadis, "Hybridity and Ambivalence: Places and Flows in Contemporary Art and Culture." Theory, Culture, and Society

McBee, Susanna. "Downtown Development Handbook: Second Edition"

Birch, Eugenie, "Planning for a New Century: The Regional Agenda"

## Cultural Expression

**Health + Wellness**

[RE]connect
Educate
address local agendas
**Economic Development**
*Improved Perception*

Sustainability

birgit cold   kim dovey   mark j. stern

mid-america regional council

susan c. seifert   nikos papastergiadis

**Transit Oriented Placemaking**

elizabeth k. meyer   philip h. lewis

Sustainability

ethical revelation

## Biodiversity
High-Performance Progression

Improve
environmental ethic

Sustainability

Meyer, Elizabeth. "Sustaining Beauty- The Performance of Appearance: A Manifesto in Three Parts."

Philip H. Lewis, Jr., "Chapter 2: An integrated Ethic," in Tomorrow by Design: A Regional Design Process for Sustainability."

Meyer, Elizabeth. "Slow Landscapes: A New Erotics of Sustainability."

McBee, Susanna. "Downtown Development Handbook: Second Edition"

Echols, S., and Pennypacker, E., "Stormwater as an Amenity: The Application of Artful Rainwater Design."

City of Kansas City, MO. "Little Blue Valley Area Plan"

Mid-America Regional Council (MARC). "Creating Sustainable Places: Vibrant, Connected, Green (Guiding Principles).

Mid-America Regional Council (MARC). "350 Highway/Blue Parkway Corridor Plan: A Land Use, Transportation, Aesthetic, and Implementation Strategy for the Redevelopment of the Corridor."

Framework Literature

**Figure 1.3: Literature Map.** The Literature Map identifies key pieces of literature that have become an important part in the development of the Knobtown District. Literature highlighted with a yellow box are pieces of literature that were used in the development of my project framework.

# Key Literature.

## Introduction

The body of research and literature analyzation is endless, however, I have identified two key pieces of literature that have helped me to create a four-part foundational framework for the Knobtown District. Working closely with Elizabeth K. Meyer's, Sustaining Beauty The performance of appearance: A manifesto in three part, and The Knobtown Land Use and Development Plan, ideas and concepts were generated to facilitate in the development of my report. These pieces of literature in addition to others have been reviewed in detail, revealing important principles and guidelines helping to direct the development of the Knobtown District.

## Sustaining Beauty- the Performance of Appearance: A Manifesto in Three Parts.

Elizabeth K. Meyer [2008]

"Sustainable landscape design is generally understood in relation to three principle-ecological health, social justice, and economic prosperity." *[Meyer 2008, 6].* Meyer's article begins to examine the role of beauty and aesthetics in the sustainable agenda. She argues that it will take more than ecologically regenerative designs for culture to become sustainable. What is needed are landscapes designed to provoke those who experience them to become more aware of how their actions affect the environment.  This involves considering the role of aesthetic environmental experiences, such as beauty, and how it influences perception of the built and natural environments *[Meyer 2008].*

"This is an aesthetic that celebrates motion and change, that encompasses dynamic processes, rather than static objects, and that embraces multiple, rather than singular visions. This is not a timeless aesthetic, but one that recognizes both the flow of passing time and the singularity of the moment in time, that demands both continuity and revolution. This aesthetic engages all the senses, not just sight, but sound, smell, touch and taste, as well." *[Spirn 1988, 108].*

"Nature is not out there but in here, interwoven in the human urban condition."
*[Meyer 2008, 16].*

Meyer's explains the modern day image of sustainability within the profession and makes efforts to introduce aesthetics to induce a better understanding of the environment, culture, and the education interlaced in our experiences with the environment. I find it really interesting how she applies the tactics of a photomontage or collage to the idea of hyper-nature helping to make the unnoticed noticed. Hyper-nature was promoted by pragmatic acknowledgements of the constrictions of building on tough urban sited and the recognition that designed landscapes are usually experienced while distracted, in the course of everyday life *[Meyer 2008].*

By celebrating social, ecological, and cultural systems through artful expression, a more thorough understanding and appreciation of the landscape will result. The cultural value of the landscape provides memorable experiences through form and space challenging, expanding, and altering the human perception of what a truly beautiful landscape may be. "A beautiful landscape is one that works on our psyche, affording the chance to ponder the world outside of ourselves." *[Meyer 2008, 17].*

The main focus of Meyer's article is the emphasis on nature as a stimulant for sustainability exhibited through hyper-nature. I plan on using her philosophical background as the foundation for my project focusing on education, aesthetics, environmental ethic, and cultural expression as a four-part framework.

## The Knobtown Land Use and Development Plan

The Knobtown Land Use and Development Plan provides a framework that has been implemented in efforts to create a systematic policy framework to strategically guide decisions regarding land use and development, transportation improvements, and public investments. This is a coordinated plan for the area which promotes the city wide iniatives established in the City's Comprehensive Plan (the FOCUS Kansas City Plan) the Major Street Plan, the KC-ONE Stormwater Management Plan and other plans to ensure that these plans are adapted to coexist with each other. The Knobtown District is striving to create a vision that promotes compatible growth,

inspires quality development and improves the areas appearance, promotes sustainable development, a diversity in housing, shopping, and transportation options *[Knobtown Land Use and Development Plan 2007].*

The Knobtown Land Use and Development Plan plays a key role in my Master's Report in that it lays the foundation, setting goals and objectives that have been previously established by area stakeholders and the Knobtown Steering Committee. This document is intended to facilitate in the development of the Knobtown District and act as a backbone in which I have built my report.

## *Current Knobtown Planning Issues*

- ○ **How do I**: provide a predictable and orderly pattern of development?
- ○ **How do I**: imoprove the image and appearance of the area through design standards for new development and enhancements of public safety?
- ○ **How do I**: provide improved shopping and services for the area?
- ○ **How do I**: preserve environmental resources as the area develops and preserve the natural beauty of the area?
- ○ **How do I**: strategically improve existing roads and provide safe and adequate circulation?
- ○ **How do I**: provide adequate infrastructure to serve existing development and new development improvements?
- ○ **How do I**: address issues related to the rural character and relative isolation of the areas?
- ○ **How do I**: plan orderly and phased development of the area to ensure that new development is compatible and of high quality?
  *[Adapted from Knobtown Land Use and Development Plan 2007, 4].*

*" Greater Kansas City is a sustainable region that increases the vitality of our*
***society**, **economy**, and **environment** for current residents and future generations."*

## Rock Island Corridor Group Overview.

"As the population of the greater Kansas City metro grows by nearly 700,000 over the next 30 years, where will these people live, work and travel and how can local communities retain their unique character?" *[Creating Sustainaable Places 2011, 4].*

The Rock Island Corridor Group of landscape architects and planning students at Kansas State University in partenership with the Mid-America Regional Council [MARC] seeks to achieve sustainability by creating more vibrant and connected green centers and corridors. In addition, these centers and corridors will provide a framework for how Kansas City will grow and adapt, encompassing environmental, social, and economic factors.

The intent of these projects is to advance the development of the Rock Island Corridor through innovative alternative models and tools. These models and tools will establish solutions to the dilemmas faced by the Rock Island Corridor and the Kansas City Metropolitan Area to guide city governments, designers and planners in a direction that can create sustainable places. Each landscape architecture student is expected to create a project that helps to achieve MARC's goals.

"MARC is a non-profit association of city and county governments and the metropolitan organizations for the bistate Kansas City region. The Mid-America Regional Council promotes regional cooperation and develops innovative solutions creating communities that people are proud to call home." *[Creating Sustainable Places 2011, 2].* In October of 2012, MARC received a $4.25 million dollar planning grant from the United States Department of Housing and Urban Development. This grant is intended to enrich and advance the regions vision of achieving sustainability through the creation of vibrant, green, and connected centers and corridors.

## ECONOMY

"Creates an innovative and competative 21st century economy, supported by highly skilled workforce positioned to take full advantage of emerging opportunities, including green jobs."

## SOCIETY

"Support a rich diversity of cultural opportunities, encourage cooperative relations, and promote the just and equitable distribution of resources and opportunities."

## ENVIRONMENT

"Preserve, protect, and restore natural assets and work to improve the quality of the environment."

[1.4]

*[Creating Sustainable Places 2011, 5].*

## Creating Sustainable Places Common Goals.

**01.** "Increase the level of development focused in existing and emerging activity centers along key transportation corridors."

**02.** "Promoting the development of vibrant, attractive places where citizens wan to live, work, shop and entertain."

**03.** "Preserve and protect regions natural resources incorporating green spaces into community activity centers."

**04.** "Connecting vibrant, green connected places with multi-modal transportation corridors."

**05.** "Increasing the housing, emplment, and transportation choices and ensuring accessibility for all the region's residents."

**06.** "Supporting an innovative, competative and adaptive economy"

**07.** "Building the capacity of MARC and local communities to achieve a regional vision"
*[Creating Sustainable Places 2011, 6]*

**Figure 1.4: Key Regional Design Principles.** These are three key principles created in efforts to create a shared vision for achieving sustainability in the Greater Kansas City region.

## Meeting the Changes.

A number of important changes are underway forcing Kansas City to rethink standard patterns of development. Responding to these changes in more sustainably conscious ways will provide Kansas City with the opportunity and ability to grow and prosper as a progressive region in the future. *[Creating Sustainable Places 2011].*

Sustainable development can be defined as a pattern of growth in which resources use aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also future generations to come. *[Creating Sustainable Places 2011].* MARC has established four key components that they foresee becoming an important part of the future of Kansas City.

○ **Residents aging in place.**
"As baby boomers age, MARC expects the percentage of elderly residents to double by 2040, creating a strong demand for transportation alternatives and housing choices."

○ **Family makeup is changing.**
"People are staying single longer, marrying later, and having fewer children. In result, only 22 percent of households are made up of single-family, detached housing consisting of families with children"

○ **Transportation costs are increasing.**
"Kansas City is heavily dependant on auto-dependent transportation. As gas prices continue to rise, people will seek housing and employment options that provide more affordable transportation options."

○ **Infrastructure costs are rising.**
"As infrastructure continues to age and development occurs, new sewers, roads and other services could cost the region $1 billion more per year for construction and maintenance of those systems."
*[Creating Sustainable Places 2011, 2]*

## Aging Population



20%

15%

10%

2010     2020     2030
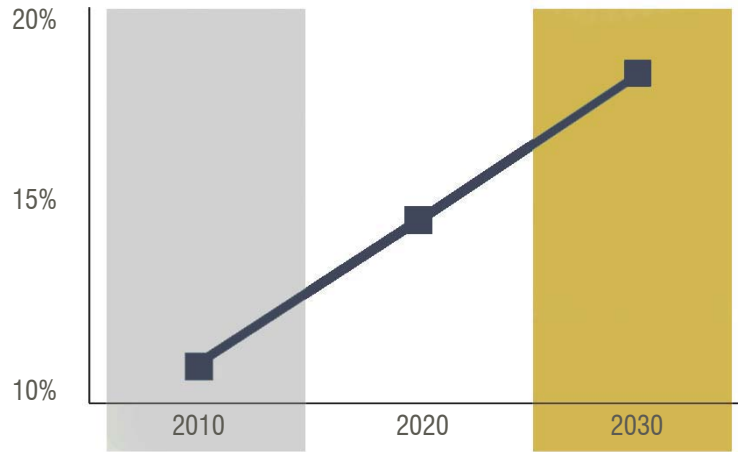
    *[Creating Sustainable Places 2011, 3]*

## Changing Family Dynamics

HOUSEHOLDS
BY TYPE 2008

BUILDING PERMITS
SINCE 2000



22%

78%

25%

75%
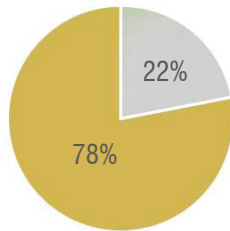
Married couples
with children
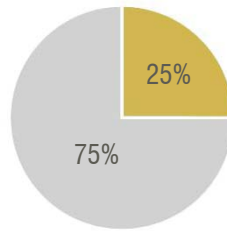
Single-family
housing

Other
households

Multifamily
housing

*[Creating Sustainable Places 2011, 3]*

**Figure 1.5: Aging Population.** The number of people aged 65 and over is expected to grow from 11 percent in 2010 to 19 percent by 2030.

**Figure 1.6: Changing Family Dynamics.** Families with children make up less than one-fourth of all households, but three-fourths of new homes are designed for single-families.

_02

# Orient.

This chapter presents the boundaries of my project identifying key dilemmas that have helped to shape the conceptualization of the Knobtown District. It also identifies the four-part foundational framwork and the relevancy of the dilemmas to contemporary landscape architecture.

## Site Background + Orientation.

The Knobtown District is located in an area of eastern Kansas City, Missouri called the Little Blue Valley. "The population of the Little Blue Valley has experienced significant growth within recent years; growing by nearly 32% during the 1990s" *[Knobtown Land Use and Development Plan 2007].*

The site is comprised of nearly 47 acres of underutilized, sparse commercial development bisected by Noland Road and 350 Highway. 350 Highway provides a transportation link not only to Lee's Summit and Raytown, but also a direct connection to the Kansas City Central Business Corridor. In result, Knobtown has experienced sky rocketing traffic volumes which has lead to the growth and development of southeastern Jacokson County. Located between the Rock Island Railroad and an existing Metro Green Corridor, the site presents itself with the opportunity to connect with the greater Kansas City Metro through sustainable transportation alternatives.



[2.1]

NTS



[2.2]

NTS
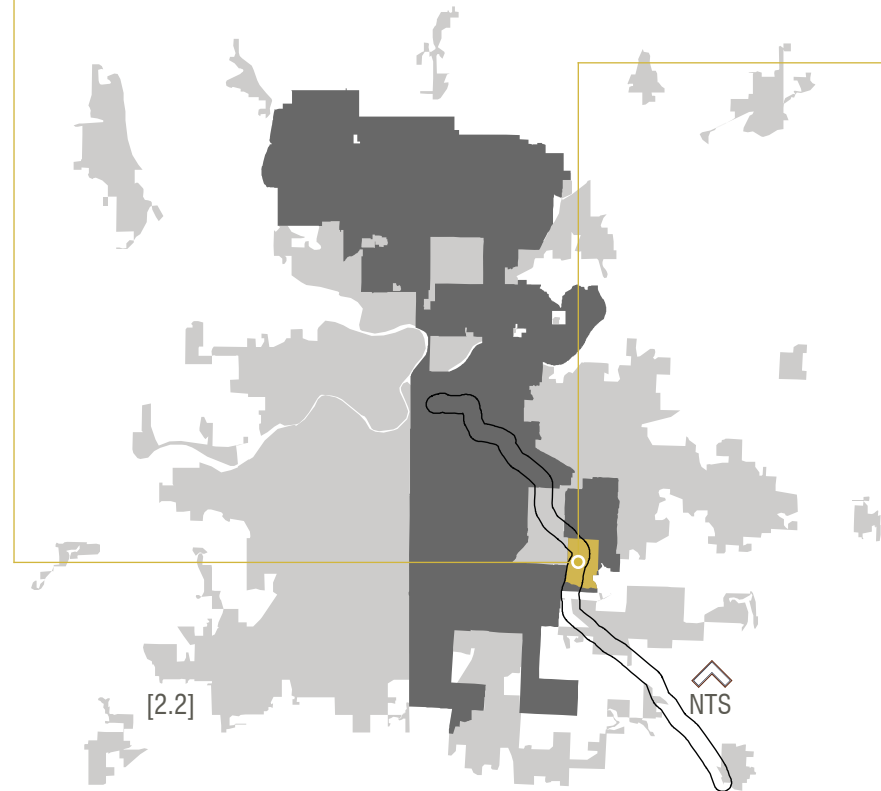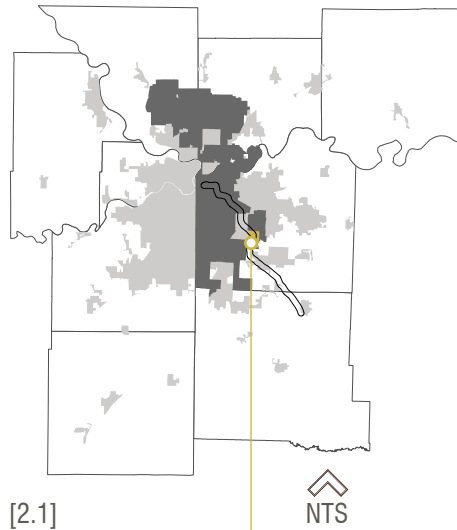
[2.3]

━━━ Proposed Commuter Rail Station

**Figure 2.1: County Context.** The Knobtown District is located in the Jackson County Missouri.

**Figure 2.2: Kansas City Context.** The Knobtown District is located in an annexed poriton of Kansas City, southwest of Raytown, Missouri.

**Figure 2.3: Site Context.** The Knobtown District lies in the Little Blue Valley and is bisected by 350 Highway and Noland Road.

*"...immersive, aesthetic experience can lead to recognition, empathy, love, respect and care for the environment."*

*--Elizabeth K. Meyer*

## Key Dilemmas.

### Theoretical Dilemma

"Sustainable landscape design is generally understood in relation to three principles -- ecological health, social justice, and economic prosperity" *[Meyer 2008, 6]*.  However, people and urbanized development has neglected to recognize the significance of our impact on the environment. The real conflict begins to address our relationship with the environment and how we can reverse the extensive amounts of environmental degredation we have caused in result of our capitalistic, consumer oriented views.

As times have changed, so to has the way we address the environment. Ethical reflection upon the land is undoubtably in its infancy, presenting the opportunity to address the relationship between society's legal and moral obligations. Keeping this in mind, it is important that we make a transition from consumer oriented landscapes that focus solely on human benefits, to "anti-consumer" landscapes that use built forms and human interest to augment the environment, allowing the two to coexist harmoniously. These landscapes should recognize and speak  to our everyday consumption-- to broader land uses and how they can help to address the global environmental crisis. Through doing this it will allow us, as humans, to alter our perceptions and ideals of our past "high" standards of living, resulting in more simplified lifestyles that can be characterized by individuals as "being satisfied with what they need as opposed to what they want." *[Meyer 2008, 12]*.

Ultimately, reestablishing the values in which we inspire will promote alternative modes of human pleasure and self-realization. More specifically, with sustainability as a goal for regions, states, and nations, it is important to look at how the public awareness of sustainability can act as a catalyst to stimulate and generate alternative design techniques.

As a society, we lie at the intersection of the past and the future, presenting us the opportunity to think organically. This project introduces and applies a four-part theoretical framework comprised of aesthetic eminence, educational exploration, cultural expression, and ethical revelation and how they can have an everlasting affect on our mind, body, and soul.

## The Knobtown District Dilemma

The Knobtown District exists today as an area in southeasten Kansas City, Missouri that can one day serve as an important gateway into the downtown core. However, this particular area presents limitations and opportunities for innovative design solutions that give the district a presence within the city.

Much of the area today consists of sensitive commercial development that is only valuable from a "special interest" point-of-view [Knobtown Land Use and Development Plan 2007]. Also, a majority of the area relies on septic tanks and on-site sanitation storage due to the lack of inadequate infrastructure. Although, a wastewater line exists along Noland Road it has remained inactive, subsequently hindering the area to grow

and develop as a community. Due to the undesirable nature of the wastewater line as it exists, cost and time become major factors in the decision to reactivate the main. Consequently, the opportunity for wastewater alternatives are endless.

With consideration given to the above, the dillemma or question becomes this-- How can the Knobtown District become a place that has a presence along the Rock Island Corridor and also provide a place that encourages innovation and enhances the area's aesthetic, education of sustainability, culture, and environmental ethic?

[2.4]

[2.5]

**Figure 2.4: Sparse Development.** Much of the area is currently under developed and under utilized.

**Figure 2.5: Sensitive Land Uses.** Currently Knobtown is consistant of commercial business that will not support a Transit-Oriented Development.

# Thesis.

The future development and evolution of the Knobtown District fosters design strategies and techniques that respond to sustainability. In doing so, society will be stimulated by artful, and innovative experiences that reveal the significance of sustainability in the world today. Developed into a Transit-Oriented Development, Knobtown provides an alternative link to the core of Kansas City addressing how we live as communities, cities, and regions in the future.

By strategically integrating aesthetics into the Rock Island Corridor, communities will benefit by being exposed to sustainability, stimulating

educational exploration, cultural expression, and environmental ethic. Ultimately, these new design principles can be utilized on a scale of situations helping communities to become aware of the current environmental crisis.

With the foundational framework in place, residents and users will become familiar with a lifestyle that influences simple, more efficient living. The experiences that will be created will influence the evolution of the area, making it a destination for the people of Kansas City.

### *Key Developmental Questions*

○ How will the driving principles; aesthetic eminence, educational exploration, cultural expression, and ethical revelation evolve into design strategies?

○ How will a Transit Oriented Development be used to achieve sustainability through design strategies and techniques for the Rock Island Corridor?

○ How will the solution affect the health, safety, and welfare of the people and place?

[2.6]

Figure 2.6: Intersection of 350 Highway and Noland Road.

## Foundational Framework.

*Figure 2.7* diagrams the situation in which society is currently addressing. In a state of transition between industrial and organic ways of thinking, we are reevaluating the way we address design. As stated by the Bruntland Commission, sustainability can be defined as the "ability to ensure that development meets the needs of the present without compromising the integrity of the needs of future generations." [Parris 2005, 10]. As we transition, it is essential that we begin addressing components that allow us to learn from what we are designing, and how aesthetically it can reinvigorate cultures and enstill environmental ethics and values in the users.

This model is intended to supplement four systems that weigh heavily on the way we design spaces and environments; political systems, economic systems, social systems, and ecological systems. These design principles are forseen as a four-part framework that can be applied to any design situation.

The Knobtown District is envisioned as a Transit-Oriented Development that will boost the local and regional awareness of sustainability. This will allow society to become engaged through the way they view, learn, experience, and reflect upon the environment. The framework will emerge in response to its contextual conditions and opportunities.

Industrial

2011

Organic

What are the ROOTS that can lead to a new awareness and appreciation for the rhythms and cycles that can sustain Kansas City?

AestheticAestheticAesthetic
AestheticAestheticAesthetic
AestheticAesthetic Aesthetic
Aesthetic
Aesthetic
Aesthetic

Objectives
Goals

New Components

Education
Aesthetic Eminence
Cultural Expression
Ethical Revelation

Educate
Economic Development
Improve environmental ethic
Increase + Enhance Wildlife
High-Performance Progression

Demonstration

INSPIRE

Sustainability Mobility

Health + Wellness

Aesthetics

Improved Perception

Conservation Design

Biodiversity

[RE]connect

Educational + Interpretive

Transitional Paradigm : Transitional Paradigm : Transitional Paradigm :: Transitional Paradigm : Transitional Paradigm

2011

Growth and Awareness of Design Strategies and Techniques

Anesthetic Anesthetic Anesthetic
Anesthetic
Anesthetic
Anesthetic
Anesthetic

Transit-Oriented Development

[2.7]

Political Systems
Economic Systems
Social Systems
Ecological Systems

2015
2020
2025
2030
2035

Figure 2.7: Foundational Framework.

# Aesthetic Eminence.

**Having a sense of the beautiful; characterized by the love of beauty through a position of prominence or superiority** *[Meyer 2008].*

The aesthetic response to an environment is the immediate reaction evoked by experiences in which they create. These responses form rapidly through exposure to experiences and are often involuntarily achieved.

Aesthetic response is most frequently stimulated by visual connections, largely due to the high rate of data recognition. I would argue that the way humans respond to aesthetics correlates directly with values and morals in which we create. Coates states, "A positive aesthetic response is more likely to lead to a positive ultimate preference, than if the initial aesthetic response were negative." *[Coates 2003, 8].*

Signals, play an integral role in aesthetics in that they help to communicate the meaning of artifacts. These signals facilitate in enstilling morals and values that allow the user to reflect upon the environment.

Perhaps one of the most important principles of the four-part framework, aesthetic eminence acts as a common denominator in each design situation.

When it comes to the Knobtown District it is important to create spaces and environments that reflect the culture of what the place can become. Conceptually, Knobtown is a very complex development that possesses the opportunity to improve the lives of the users within. Aesthetic improvements will manifest in every design element helping to shape the way the user interacts with the natural and built world.


[2.8]


[2.9]


[2.10]

**Figure 2.8: VIew of stormwater amenity.**

**Figure 2.9: View of undulating wall at Tanner Springs Park.**

**Figure 2.10: View of natural area at Tanner Springs Park.**

## Educationial Exploration.

"We are accustomed to thinking of learning as good in and of itself." *[Orr 1991, 3].* The education that many of us have experienced throughout our lives has in some cases created undersirable values. With a constant struggle for achieving more sustainable lifestyles, our necessities [climate, water, the productivity and resilience of natural systems] are becoming jeopardized. In many cases, the world in which we live is not due to uneducated people, rather, well educated individuals. These people have neglected to address design and environment in a way that provides ecological goods and services with human benefits. Orr states that education "...emphasizes theories instead of

**The act or experience that has a formative effect on the mind; character or physical ability of an individual** *[Meyer 2008].*

values, concepts rather than human beings, abstraction rather than consciousness, answers instead of questions, ideology and efficiency rather than conscience." *[3].* Our current education will only compound our problems. Orr argues that it is not an argument for ignorance, rather a statement that education must now be measured against *[Orr 1991].*

In order to appropriately address the way we learn from the environment it is important to place strategic emphasis on systems, signage and the technology in which we provide. The importance lies in how we address these situations and what experiences they provide the user. Through viewing, reading, learning, and interacting with these systems, sustainability will begin to grow and evolve.


[2.11]


[2.12]


[2.13]
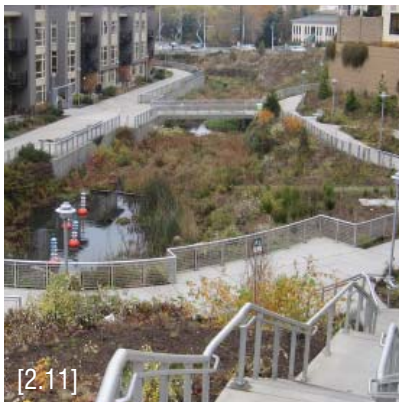
**Figure 2.11: Daylighted stormwater amenity at Thornton Creek.**

**Figure 2.12: Educational signage.**

**Figure 2.13: Indoor Living Machine wastewater management system.**

# Cultural Expression.

Sustainable landscape design is not the same as sustainable development or ecological design. Sustainable development requires more than designed landscapes that are created using sustainable technologies. Design is a cultural act, a product of culture made with the materials of nature and often embedded within a particular social formation or structure *[Meyer 2008].* Cultural remnants engage social formations creating value and moral obligation for every experience we have. These values then become engrained in the way we function on a daily basis often challenging and altering the way we think and view situations.

**The ability to exhibit emotion through behavior and beliefs; characteristic of a particular social group. A set of shared attitudes, values, goals and practices enlightening societal issues** *[Meyer 2008].*

Cultural expression is a powerful human tool for survival, but fragile in many senses. It is often changing and easily lost for it only exists in our minds *[Meyer 2008].* "Our languages, government, buildings and other man-made things are merely products of culture. They are not culture in themselves, however, they inspire cultures to grow and transforms." *[Meyer 2008, 21].*

The Knobtown District is conceptualized as an environment that inspires cultures to grow and transform the way we interact, learn, observe,and evolve into a society that is more environmentally friendly.
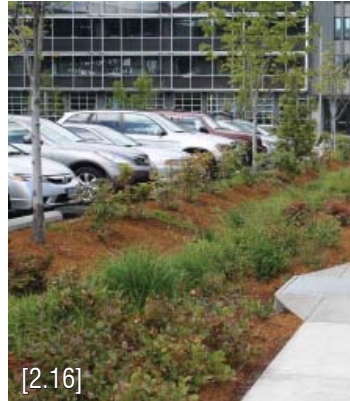


**Figure 2.14: View of farmer's market.**

**Figure 2.15: View of inspirational building facade character.**

**Figure 2.16: Drainage swale provides inspires a sustainably conscious culture.**

# Ethical Revelation.

Humans are the only self-reflective, deliberative moral agents. Humans co-inhabit Earth with five to ten million other species. Of which, humans were equipped the wise species, with a conscience. *[Bunnin 2003].* In classical Enlightenment ethic, it excludes the global community of life from considerations, resulting in a paradox of a self-conscious species that acts only in its collective self-interest towards the rest. Environmental ethics claim that we humans are not so 'enlightened' as once supposed.

Humans are the only evaluators who can reflect on what is going on in plant and animal species, evolutionary history, or who can

**The act of revealing the system of moral values within a local culture strengthening environmental ethic; structuring design that influences the way people relate to the landscape** *[Meyer 2008].*

deliberate what should be done to conserve these resources and life-forms. "Earth can not teach us how to do this evaluating." *[Bunnin 2003, 527].* Thus, it is vital to the existence of humans that we create spaces and environments that provide the opportunity for the user to reflect on the environment. Nature is what we value; what we rely on everyday for resources, inspiration, and happiness.

"Once the mark of an educated and ethical person could be summed up as *civitas,* the privelages, rights and responsibilities of citizenship." *[Bunnin 2003, 528].* The mark of a virtuous person today is increasingly something more. It is not enough to be a good 'citizen', for that is only half the truth; we are 'residents' dwelling on the landscape as a commodity. "We are expanding ethics: it is not just what a society does to its slaves, women, blacks, minorities, handicapped, or children, but what it does to the fauna, flora, species, ecosystems and landscapes that reveals the character of a society." [Bunnin 2003, 528].



[2.17]

[2.18]

[2.19]

**Figure 2.17: Artful installations and amenities will engage users.**

**Figure 2.18: Observing natural processes will inspire environmental ethic.**

**Figure 2.19: Interactions with the environment enstills environmental ethic.**

## Issue Relevancy to Contemporary Landscape Architecture

Sustainable beauty is dynamic, not static. The intrinsic value of a landscape lies within its evolution through time. A landscape is a complex set of environments, systems, and organisms that coexist; relying on one another for survival. Landscape architects address these environments in ways that share many characteristics and rhythms with architecture and sculpture. Our medium consists of spatial materials that function as elements presenting ecological benefits, as well as human pleasures.

Since sustainable landscapes reveal, enable, repair, and regenerate ecological processes, they are temporal and dynamic *[Meyer, 2008]*. Sustainable beauty arrests time, delays time; it often opens up daily experiences to what Michael Van Valkenburgh calls "psychological

intimate immensity," the wonder of urban social and natural ecologies palpable through the landscape medium *[Meyer 2008, 21]*. It is vital to understand that projects must remain dynamic rather than static to uphold to disturbances creating resilient environments that can transform, grow, and evolve through time.

This sense of beauty, is one that evolves over time in response to different needs, or contexts, and is often accepted in many fields outside of landscape architecture. In one of his foreseeing articles that outlined the issues to be faced by contemporary landscape architecture as it emerged as a profession, Charles Eliot, Jr. established a position within the formal and informal debates of the 1890s by arguing that beauty was not intrinsic.

*"The fact may not be explicable, but it is one of the common places of science that the form which every vital product takes has been shaped for it by natural selection through millions of ages, with a view to its use, advantage or convenience, and that beauty has resulted from evolution [...] Whoever, regardless of circumstances, insists upon any particular style or mode of arranging land and its accompanying landscape, most certainly a quack. He has overlooked the important bascal fact that, although beauty does not consist in fitness, nevertheless all that would be fair must first be fit. True art is expressive before it is beautiful."*
*[Eliot, 1896]*

It is not enough to design landscapes that incorporate best management practices and follow LEED criteria. It is not enough to emulate the admirable designs of past generations. Designed landscapes, such as the Knobtown District must be constructed in the realization that they are not just servicing the environment but also creating human experiences. They need to move users to action. "Yet they are visited and inhabited by people who have great impact on the environment in everything they do -- where they live, how they commute, and what they consume." *[Meyer 2008, 20].*

Many professions and disciplines will contribute to our understanding of sustainability. Landscape architects do so by making places that are constructed performing ecosystems and constructed aesthetic experiences. The performance of a landcape's appearance, and the experience of beauty, should have as much currency in debates about what a sustainable landscape might, and should, be as the performance of its ecological systems. Contemporary landscape architeture is in a position to transform a new generation of users into environmentally conscious citizens focusing on aesthetics as a vehicle changing the way cultures evolve, education grows, and environmental ethic is established.

# Investigate.

This chapter presents the historical context of Transit-Oriented Developments and key features that have proven to be beneficial in these developments.  The dilemmas that have previously been discussed are mapped and analzed. The key maps displayed in this chapter will help form design strategies that achieve my four-part framework addressing aesthetic eminence, educational exploration, cultural expression, and ethical revelation.

# The Historical Context of Transit Oriented Developments.

The concept of Transit-Oriented Development is hardly new, after all, in the early 20th century a significant amount of development was based around transportation systems. Many of these systems were designed in efforts to maximize the value of the surrounding real estate. The earliest commuter rail systems were powered by steam engines and could achieve high sustained speeds, however, they were slow at accelerating and decelerating. In effect, rail stations were spaced miles from one-another *[Coleman 1999].*

"Beginning in the late 1970s, a new wave of transit was built in the United States to provide rail transit in growing metropolitan areas that did not previously have urban rail systems." *[Schneider, 2004].* The new rail transit systems were the first of their kind to be completely funded by the public sector. In contrast with previous transportation systems, the new rail networks were designed and built with the expectation that most of the ridership would come from users commuting to the station by car. In result, there were few attempts to integrate new station into the existing land uses *[Belzer 2002].*

In effect, the period began seeing a growing interest in the idea behind Transit-Oriented Development (TOD). Promoting sustainable land use near transit stations, agencies such as the Bay Area Rapid Transit (BART) and Washington Metropolitan Area Transportation Authority (WMATA) began developing ways to promote sustainable development patterns near existing stations.

"Today, Transit-Oriented Developments can be described as a community development model that when successfully implemented can produce significant economic, environmental and social benefits for people and the neighborhoods, cities and regions in which they live, work, and play." *[Coleman 1999, 13].* This approach addresses unique opportunities provided by public transportation. At a localized neighborhood scale, TODs are typically defined as, "compact community developments within an easy

walking or biking distance." *[Coleman 1999, 14].* In effect, these developments often times have proven to be healthy places in terms of economy, society, and environment.

Although there is not a "one-size-fits-all" approach there is a common set of characteristics. These help to define places requiring different strategies and approaches employing techniques to foster the growth of vibrant transit-oriented neighborhoods that enhance existing assets and conditions.

At the core of Transit-Oriented Development is the idea that people with a wide range of incomes can live and work in a place with transportation options, giving them the

choice to take care of daily duites and tasks by using transit, walking or biking, rather than driving. Most transit supportive places tend to be compact neighborhoods of varying densities. Density is a key variable that allows communities in rural, suburban, and urban environments to support a mix of uses and activities including work places, stores, restaurants, and different housing types.

## Characteristics of Transit Oriented Developments.

Transit-Oriented Developments should, at the very least, encourage the use of public transit by properly developing a supportive development consistent of residential, commercial, or office uses -- or a combination of all three -- in close relation with a transit node *[Cervero, 1993]*. However, successful TOD involves more than simply placing a transit stop in a residential neighborhood, business district, or mixed-use development.

In addition to providing transportation options, Transit-Oriented Developments should improve the "livability" of communities and neighborhoods, while successfully being integrated into the economic structure of the area. TOD can create places for community life, serve as a key force in the revitalization of  neighborhoods, city centers, help create new businesses and improve the access to job opportunities, helping to make communities safer, in part by making them more attractive and comfortable *[Transit Cooperative, 1997]*. According to Cervero, the hallmarks of Transit-Oriented Development are:

- enhanced mobility and environment
- pedestrian friendliness
- alternative living and working environments
- neighborhood revitalization
- public safety
- public celebration
      *[Cervero 1993, 4]*.

| Major Elements of Transit-Oriented Developments | |
| --- | --- |
| Element | Description |
| Enhanced Mobility and Environment | The major component of TOD is a diversity of housing, jobs, shops and other activites around a transit node. In addition, improved access to these land uses, the physical environment is enhanced. For example, TOD is expected to result in improved air quality, as commuting is converted to park-and-ride trips, bike-and-ride trips or walking. |
| Pedestrian Friendliness | TOD involves the development of land uses that encourage walking, such as narrow streets with trees, wide sidewalks, an absence of surface parking lots and large building setbacks. Typical structures are street-oriented, mixed-use buildings that include a blend of residential, retail, and commercial uses. |
| Alternative Suburban Living | TOD allows the opportunity to live in that suburbs without being entirely dependent of the automobile to access a variety of activities and services associated with cities. The pedestrian-scale and design features of Transit-Oriented Development promote social interactions. |
| Neighborhood Revitalization | TOD can be a means of stimulating economic growth in blighted or declining areas served by rail or other transit. Redevelopment activities can promote Transit-Oriented Development and improve the social and physical infrastructure of neighborhoods, providing needed housing and services to households for a mix of incomes. |
| Public Safety | TOD places a mix of residents, workers, and shopkeepers within a compact area, allowing for a continual security presences by virtue of constant activity. |
| Public Celebration | TOD should includee some public open space, such as plaza or park, that serves as a gathering place for events such as parades, performances, concerts, or farmer's markets. |

[T3.1]                                                          *[Cervo 1993]*

**Table 3.1: Major Elements of Transit Oriented Developments.**
Each element is essential to the prosperity of TOD.

## Transit-Oriented Developments Relate to New Urbanist and Smart Growth Principles.

In recent years, both "New Urbanism" and "smart growth" have emerged as influential movements in the design profession, and have even gained recognition in mainstream media as progressive approaches to solving problems associated with urban sprawl. Both the New Urbanist and smart growth movements advocate many of the basic elements or principles of Transit-Oriented Development.

New Urbanism, also called "neo-traditional planning," has been vindicated over the past decades by urban designers and architects such as Andres Duany, Elizabeth Plater-Zyberk, and Peter Calthorpe. These New Urbanist designers generally advocate for returning to pre-World War II town planning

principles, with an emphasis on design that provide a variety of land uses, narrow streets in a tight grid pattern, decreased setbacks and reduced parking, among others. Much of the success that is associated with Transit-Oriented Development is often included in New Urbanist projects. However, transit is not an essential or required feature in a New Urbanist development. Often times New Urbanist projects take place in surburban or exurban areas -- and while they may contain higher densities and more pedestrian friendly design features -- they are not accessible via public transit *[Manning 1997]*.

Smart growth is somewhat of a broader and more mainstream movement that draws on many of the New Urban Design principles.

There is no single definition of smart growth, however, there is a common line that describes it as, development that revitalizes central cities and older suburbs to support and enhance public transit and preserve open space *[smart growth, 2000]*. The underlying premise is that much of America's post-industrial suburban developments consist of segregated land uses, an increasing deterioration of preservation land, and significant declines in downtown areas. Smart growth generally calls for higher-density, Transit-Oriented Development, with an emphasis on providing a balanced mix of housing, jobs, and shopping opportunities within a community.

## Specific Features of Transit-Oriented Development.

### *Proximity to Rail Station*

The majority of transit systems involve a degree of pedestrian foot traffic to transit access points, stations, and park-and-ride lots, therefore it is essential that the proximity of residences to station locations is a comfortable walking distances. Cervero states, "...a central premise of transit villages is to concentrate development within a one-quarter mile walking distance of a transit station" *[Cervero 1993 14].* Directly related to the density of population, TOD must adequately provide residents and visitors a reasonable walking distance between points-of-interest and the rail station to increase ridership.

According to Richard Unterman, 2,300 feet is the maximum distance people are willing to walk for general purposes *[Unterman 1984, 14].* Studies on transit proximity and ridership in the Bay Area, Washington D.C., and Toronto and Edmonton, Canada indicate that, generally, transit ridership is the highes within one-third of a mile from the rail station *[Cervero, 1993].* It is also important to identify potential destinations along the line, for they also have an important affect on transit ridership, as is the cost of parking for those commuting.

### *Design Features*

Generally speaking, Transit-Oriented Development should promote walking and transit ride while discouraging the use of automobile. TOD often create places that have design features such as landscaped sidewalks, rear cluster parking, retail oriented first floors that make walking and transit riding more enjoyable. Cervero has identified typical TOD design feartures as listed in Table 3.2.

## Design Features for Transit-Oriented Development

- Continuous and direct physical linkages between major activity centers; siting of buildings and complementary uses to minimize distances to transit stops.

- Streetwalls on ground-floor retail and varied building heights, textures, and facades that enhance the pedestrian experience; siting commercial land uses near high traffic sidewalk edges.

- Integration of major commercial centers with the transit facility

- Gridlike street patterns that allow a variety of destinations to be connected by foot; avoiding cul-de-sacs, and curvilinear street arangements, when possible, to create circuitous walks and forcing public transit to meander and retrace their paths, direct site lines to transit stops.

- Minimizing off-street parking supplies; where land costs are higher, tucking parking under buildings or placing them at the periphery of structures.

- Providing pedestrian amenities as attractive landscaping, continuous and paved sidewalks, street furnishings, urban art, screening of parking, building overhangs for weather protection, and safe street crossings.

- Convenient siting of transit shelters, benches and route information.

- Creating public open spaces and pedestrian plazas that are convenient to transit.

[T3.2]                                                                                   *[Cervo 1993]*

**Table 3.2: Design Features for Transit-Oriented Developments.**

## *Density of Design Features*

High density is another key feature of a successful Transit-Oriented Development. If origins and destinations are spread throughout a region, those with access to a car will likely drive rather than use public transportation *[Cervero 1993].* On the other had a densely compact TOD places a critical mass of people in a central location, providing the ridership numbers necessary to make transit feasible and efficient. A high density development offers three primary benefits to improve transit service: 1) routes to a realatively large number of points can be offered 2) the cost per ride of operating transit is reduced when ridership is increased; and 3) increased density allows transit service to be provided more frequently." *[Cervero 1993, 11].*

A number of research efforts have shown a clear link between increased residential density and increased transit ridership. A widely cited study conducted in 1977 by Boris Pushkarev and Jeffrey Zupan concluded that sufficient rail transit demand requires residential densities averaging 12 units per acre connected to a downtown with at least 50 million square feet of nonresidential uses. The study noted that residential densities in the 2 to 7 units per acre produced marginal transit use; densities between 7 and 30 units per acre were necessary to sustain significant transit use. As a density increases from 7 to 30 dwelling units, transit demands roughly tripled, and a significant decline in auto dependency was notes *[Pushkarev and Zupan, 1977].*

In general, the population and employment densities needed to support transit are significantly higher than the average densities in most U.S. suburbs *[Porter 1997].* The typical suburban block pattern consists of single-family detached subdivisions with densities ranging between one and eight units per acre, with single-family attached (townhouses) ranging between 8 to 12 units per acre.

## Knobtown Lies at the Convergence of Infrastructure Networks and Natural Systems

Much of the development of the Knobtown District relies on what lies at the periphery of the site boundary. The Rock Island Corridor bounds Knobtown to the west and presents a potential opportunity to connect to a planned commuter rail. The intersection of 350 Highway and Noland Road provides a unique opportunity in that it is a point where infrastructural networks and natural systems converge. In result, the potentials for the development are endless.

Bounding the site to the east is a proposed Metro Green Corridor which is a piece to a larger interconnected system of public and private natural areas, greenways and trails linking communities throughout the Kansas City Metropolitan. This provides easy access

from surrounding communities making the Knobtown District a suitable place for a Transit-Oriented Development.Congruently, infrastructural networks such as 350 Highway and Noland Road converge at this intersection.

With nearly 11,000- 22,000 people passing through Knobtown, the district becomes an important gateway into the southern Kansas City Business District *[Knobtown Land Use and Area Plan 2007].* The Knobtown District could substantially contribute to the relief of traffic congestion throughout the area by providing alternative linkages and transportation options to the region.

### *Opportunities*

○ *Increase circulation through area with transportation alternatives, proposed bus routes, trail systems and linkages, and infrastructure improvements*

○ *Connect to Rock Island Rail Line and future Commuter Rail*
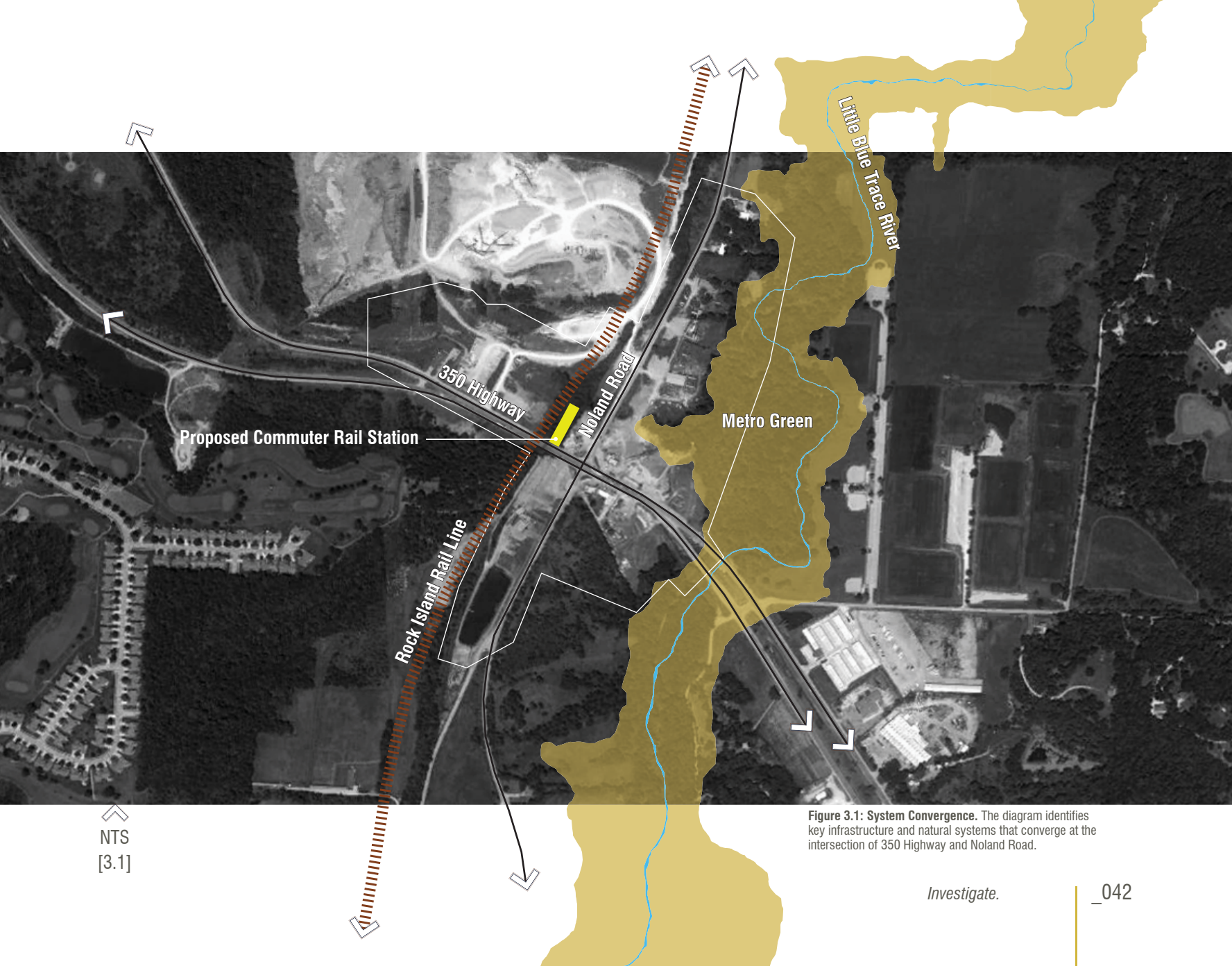
_041

Little Blue Trace River

350 Highway

Noland Road

Proposed Commuter Rail Station

Metro Green

Rock Island Rail Line

NTS

[3.1]

**Figure 3.1: System Convergence.** The diagram identifies key infrastructure and natural systems that converge at the intersection of 350 Highway and Noland Road.

## Sensitive Land Uses Will Not Support Transit-Oriented Development.

Much of the development that has occurred within the past decades consists of sensitive uses that are only desirable from a special interest point-of-view ranging from adult entertainment venues to used car dealerships and asphalt companies. In result, these businesses have not demonstrated any benefit to the community. Rather, these land uses have been seen as nuisances. It is critical to improve the appearance of this area to discourage more uses from emerging.

The future development of the Knobtown District should follow the basis of economic reality, with a harmonious balance between future development and the protection of neighborhoods, the natural environment, and infrastructure considerations. In order

to truly establish a development aesthetic, it is essential that the land uses reflect the environment in which the TOD creates.

### Opportunities

○ *Establish a transit oriented mixed-use environment.*

○ *Ensure a diverse mix of residential, retail/ commercial. and office land uses.*

○ *Build the economic vitality of the area by strategizing development into develop-able business districts, and entertainment districts*

○ *Build culture through the implementation of goods and services that engage and educate users.*

○ *Provide areas for users to reflect ethically on the environment.*



[3.2]



[3.3]

**Figure 3.2: View of Knobtown Liquor at the intersection of 350 Highway and Noland Road.**

**Figure 3.3: View looking across 350 Highway at current used car dealership.**

Hillside Landscape Materials

Vacant house

Winterstone Rock Company

Raceway Auction House

Proposed Commuter Rail Station

T-Shirt Market

Van City Used Car Dealership

Knobtown Ink Tattoo Parlor

Knobtown Liquor

Pure Adult  Nightclub

Shelia's Closet Lingerie Store

Steve William's Asphalt Company

NTS
[3.4]
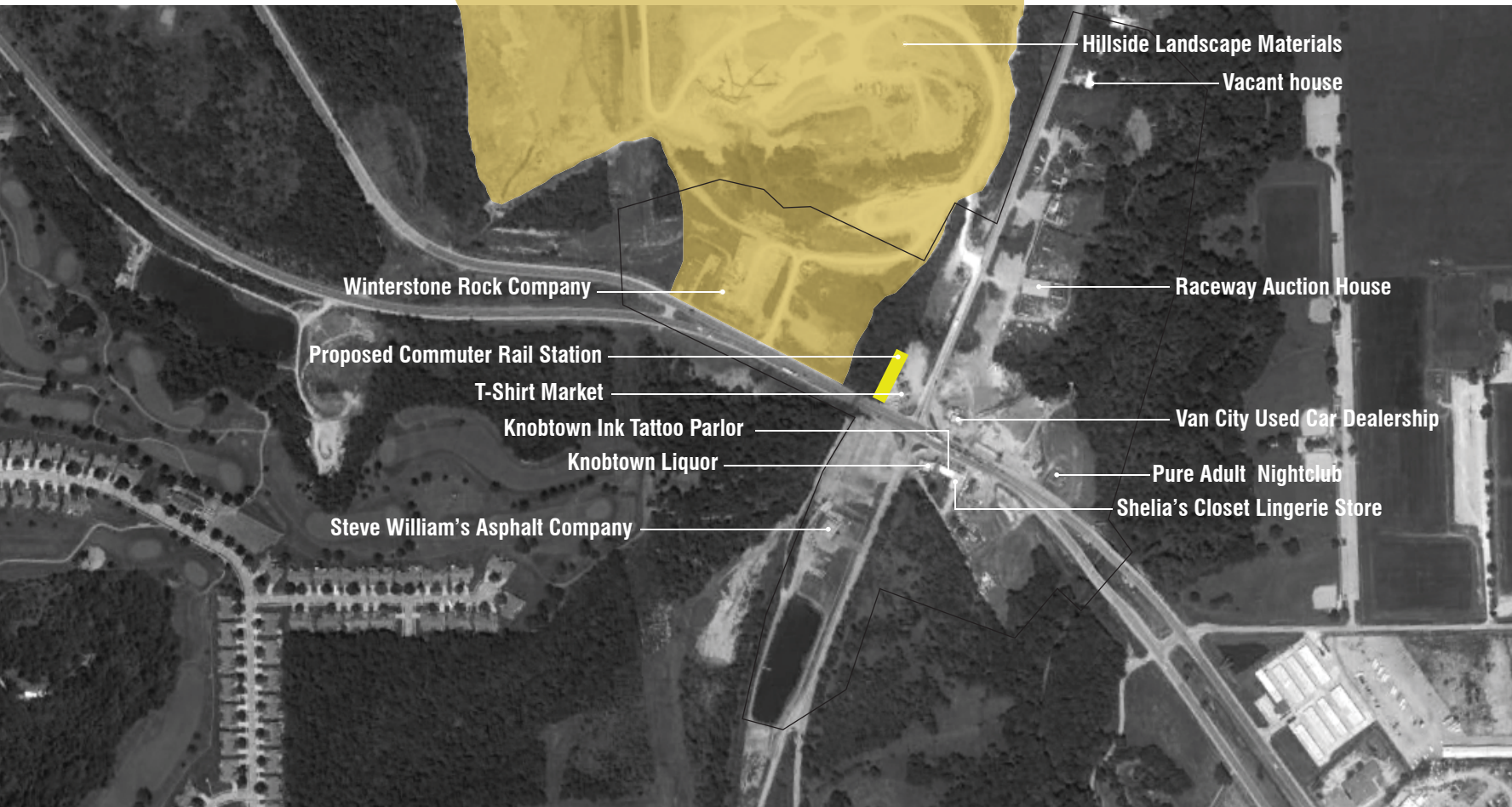
**Figure 3.4: Sensitive Land Uses.** Current Land Use Development and patterns do not support necessary characteristics for Transit-Oriented Development.

## Potential for Transit-Oriented Development In the Knobtown District.

### *Future Land Use Can Provide A Dense, Walkable Knobtown Core*

The future development of the Knobtown District has been zoned as a mixed-use neighborhood, opening up the opportunity for diverse housing, shopping, employment, and transportation options. Lying at the juncture of the Rock Island rail line, 350 Highway and Noland Road Knobtown connects into land uses that provide social and ecological services to the surrounding area.

Bounded on all sides by conservation land and the Metro Green Corridor, Knobtown can act as a self-sustaining community that allows users easy access to important amenities such as, transit options, employment, housing, shopping and other services.

### *Opportunities*

o *Provide housing density and ridership that can support a transit stop in the Knobtown District.*

o *Focus growth around proposed transit station to capitalize on expensive public investments.*

o *Create an identity for the Knobtown District*

o *Improve ridership for the proposed transit station*
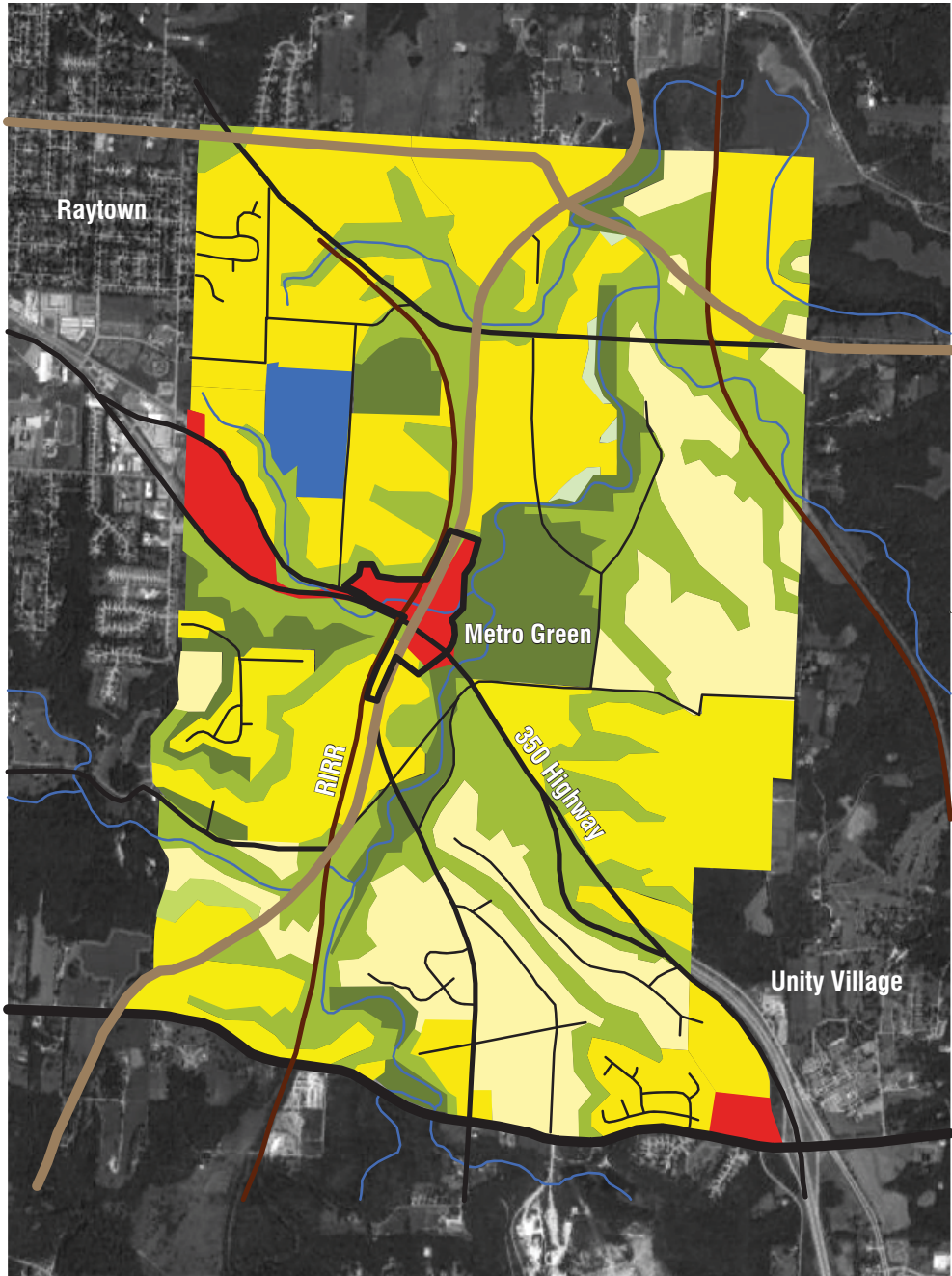
## Legend

- Knobtown Site Boundary
- Freeway
- Parkway/ Boulevard
- Roads
- Residential very low-density
- Residential low-density
- Light Industrial
- Mixed Use
- Park
- Open space

NTS

Raytown

Metro Green

R/RR

350 Highway

Unity Village

**Figure 3.5: Projected Land Use.** Based upon the Knobtown Land Use and Development Plan the Knobtown District has been zoned as a mixed-use neighborhood with high-potential for a Transit-Oriented Development.

*Investigate.*          _046

# Transportation Improvements Will Help Alleviate Congestion and Increase User Access.

## Improvements Will Make Knobtown A Desirable Transit Hub

As development strategies have changed so have the way we deal with traffic congestion. In order to adequately, address the needs of a Transit-Oriented Development we first must asssess the exisitng road conditions. A majority of the transportation network was developed before the Blue Valley Area was annexed into Kansas CIty *[Knobtown Land Use and Development Plan 2007].* In result, a majority of the roads are built to meet rural standards. Furthermore, there is a disconnect between trail systems that are used to connect the pedestrian and bicyclists.

According to the Knobtown Land Use and Development Plan, traffic improvements have been prioritized to build an "economical road system to meet exisitng and future needs, target areas ripe for development, and balance the needs between vehicle, transit, pedestrian, and bicycle." *[26].* The projects not only address the road infrastructure, but trail proposals along the Metro Green Corridor connecting to the development zone.

## Opportunities

o  *Improve the capacity and safety of existing roads to meet city standards*

o  *Create Streets friendly to the pedestrian and bicyclist by incorporating bike lanes on roads and making sidewalks a comfortable with to promote human interaction.*

o  *Increase buffers between vehicular and pedestrian traffic with sitable planters and street lanes*

o  *Introduce traffic strategies that encourage vehicular traffic to slow down encouraging passing traffic to stop and spend time in Knobtown.*
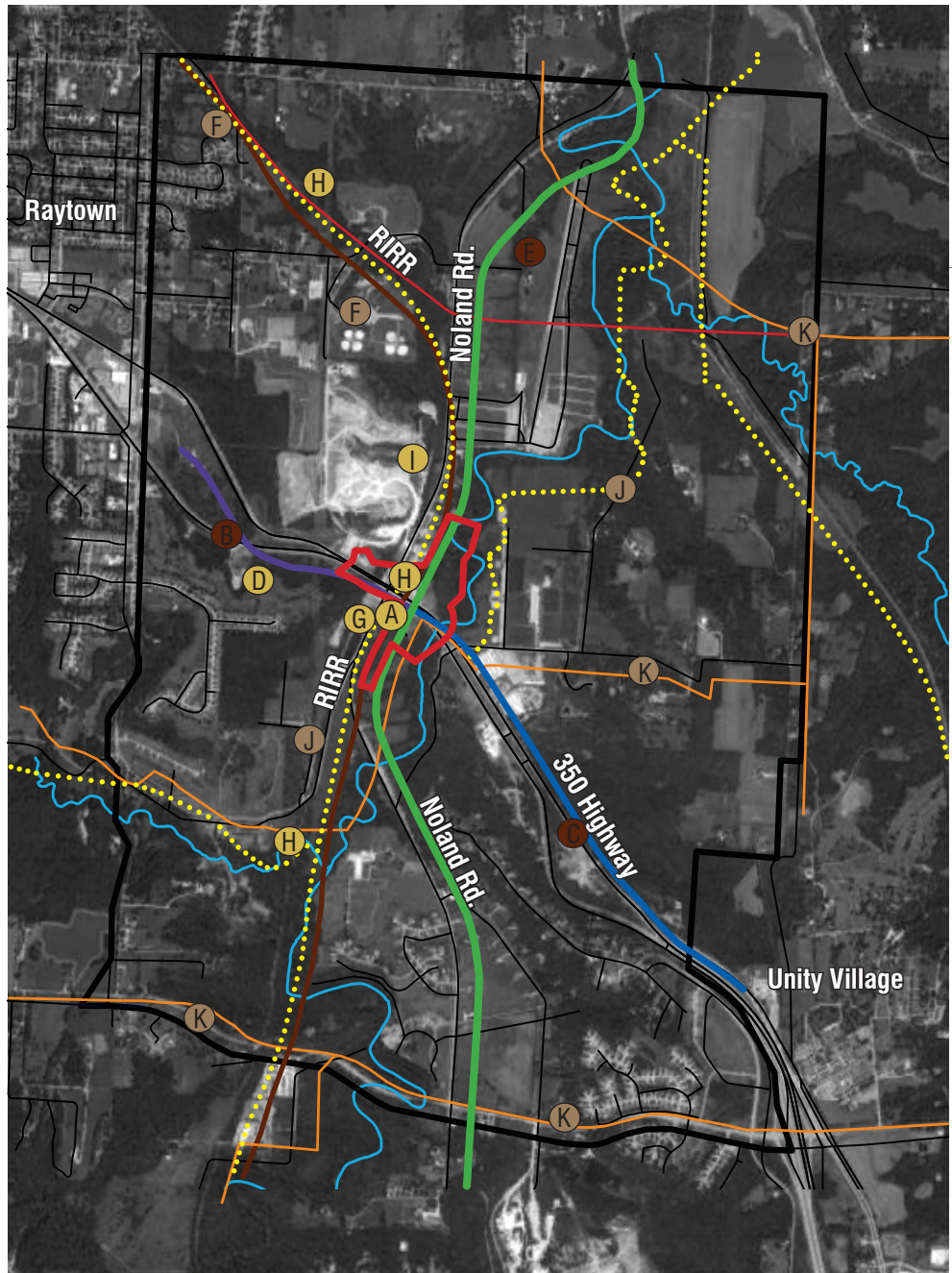
## Legend

| | |
|---|---|
| ──── | Knobtown Site Boundary |
| ·········· | Metro Green Trails |
| ──── | Proposed Bike Trails |
| ──── | Proposed Bus Route |

**1  2  3  Prioritization of Projects**

Ⓐ

Ⓓ

Ⓖ

Ⓗ  Trails-*three pedestrian bridges over stream*

Ⓘ  Crushed rock trail on old railroad bed
   Removal of rail bridges
Ⓙ  Metro Green crushed rock trail
Ⓚ  Establish on-street trail linkages
Ⓑ

Ⓒ

Ⓔ

**Figure 3.6: Transportation Improvements.**

## Inactive Wastewater Infrastructure Limits the Development of the Knobtown District.

Infrastructure needs in Knobtown are significant and resources to address these needs are limited. The provision of adequate wastewater infrastructure in the Knobtown District is important to serve the needs of the community, encourage new development, and protect the publics health and the environmental quality of the Blue Valley Area *[Knobtown Land Use and Development Plan 2007].*

A large portion of the Knobtown area remains inaccessible to sanitary sewer or possess sewer lines that are undersized and in disrepair. Consequently, the high infrastructure cost presents limitations that should be determined by a sewer expansion study at a later time.

Similarly, Knobtown also possesses water main infrastructure that is either smaller than six inches in diameter not supporting fire protection and residential development, or are currently without water service *[Knobtown Land Use and Development Plan 2007].* The existing main north of 350 Highway appears to marginally serve the exisiting Knobtown users. It is essential to the development of Knobtown that strategies address theses issues to facilitate development and aesthetic requirements established in the Knobtown Land Use and Development Plan.

*Opportunities*

- *Improve the water inflitration times through the use of infiltration areas, and vegetated swales*

- *Locate wetland areas near Little Blue Trace River*

- *Provide rooftop gardens and infiltration gardens in courtyard and plaza spaces*

- *Implement Living Machine technology as a sustainable alternative to conventional wastewater treatment*

- *Educate the public of the current wastewater issue*

_049
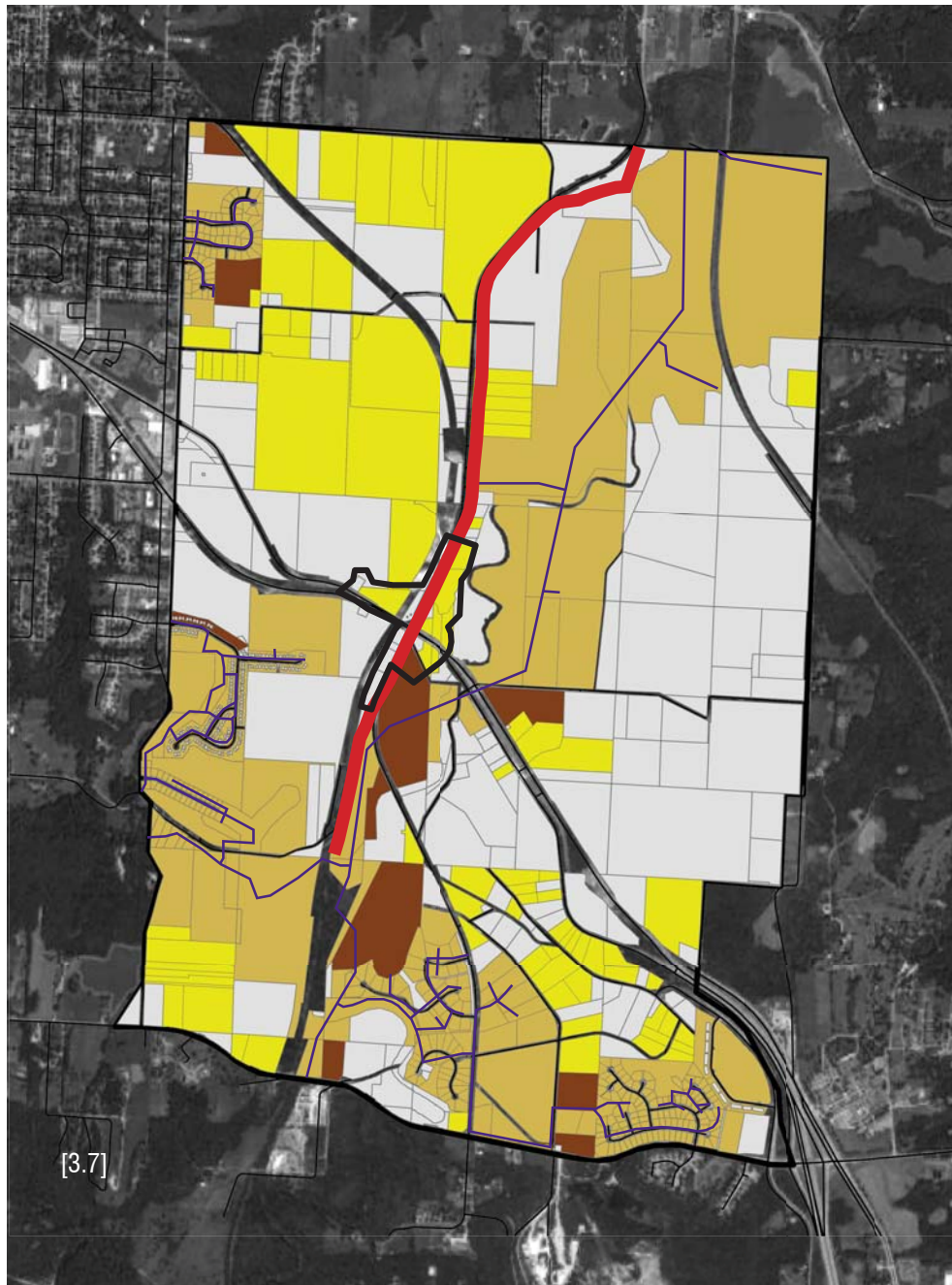
## Legend

| | |
|---|---|
| ▬▬▬ | Knobtown site boundary |
| ▬▬▬ | Inactive sewer main |
| ▬▬▬ | Sanitary sewer |
| ▬▬▬ | Roads |
| � yellow | Parcels using on-site sanitary sewer |
| gold | Parcels connected to municipal sanitary sewer |
| brown | Parcels connected to municipal sewer and on-site sanitary sewer |
| gray | None |

**Figure 3.7: Inadequate Wastewater Infrastructure.**

[3.7]

## Aesthetic Eminence.

 The lack of aesthetic appeal has created a misconception of what Knobtown can one day be, As much of the area currently is plagued with undesirable appeal, the opportunities are endless.  Perhaps the most important arterials to Knobtown, 350 Highway and Noland Road must become places that exhibit a high level of aesthetic appeal. In doing so, these locations must express the diversity of the development explicitly displaying the culture of the development.

Similarly, it is important to think about other natural and infrastructural connections. Being elevated above the Knobtown District, it is essential that the Rock Island Rail Line provides desirable views of the District.

### *Opportunities*

○ *Access points to the site must create desirable views that display the culture of the development*

○ *Use the aesthetic appeal of natural areas to exemplify processes*

○ *Provide environments unique to the area through building character, pedestrian spaces, and natural areas.*

Proposed Commuter Rail Station

Rock Island Rail Line

Exisitng Water Retention Area

350 Highway

Noland Road

Metro Green Corridor

Key Aesthetic Opportunities
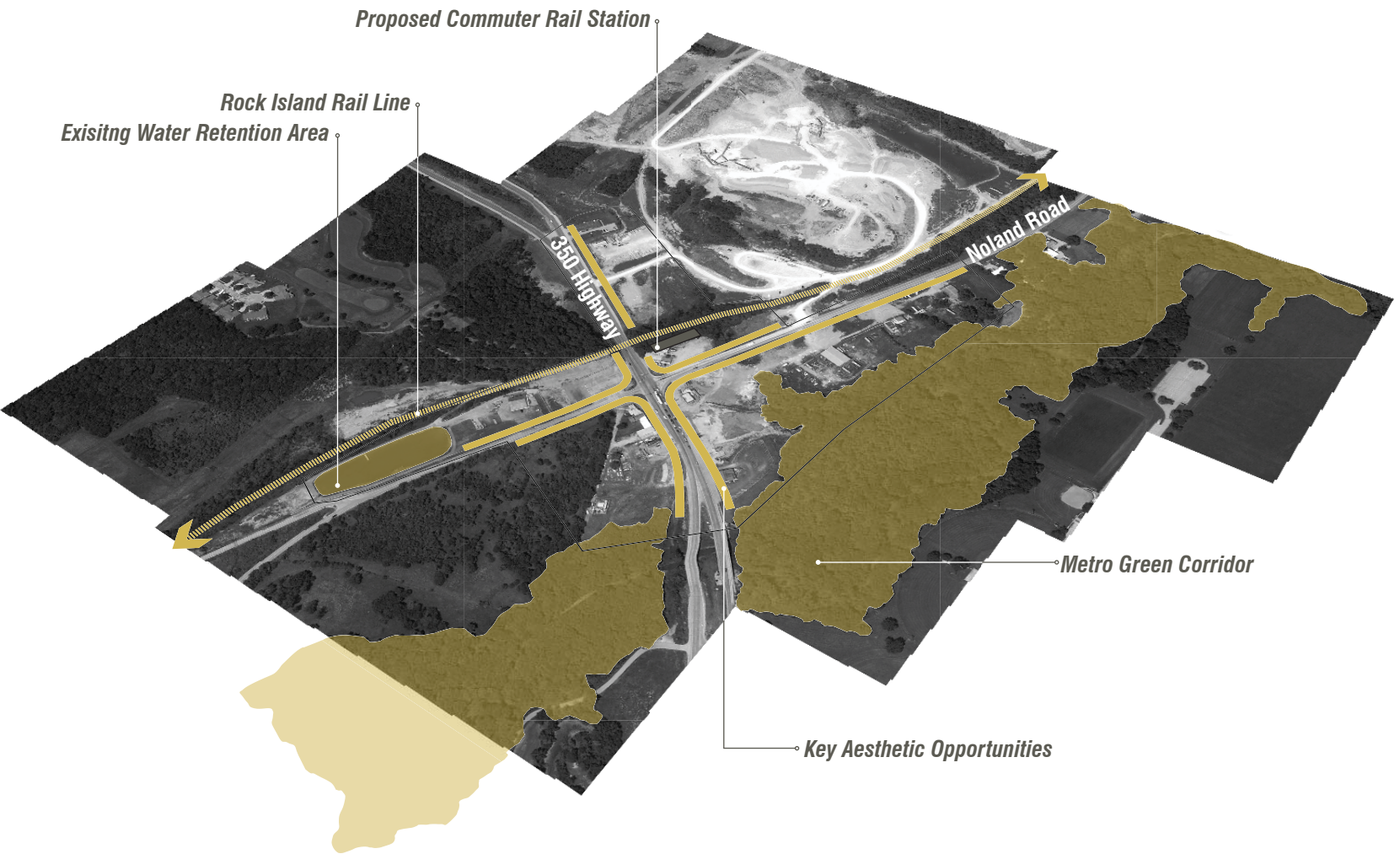
Aesthetic Eminence.
[3.8]

**Figure 3.8: Aesthetic Eminence Opportunities.** Highlighted areas have high potential for aesthetic appeal.

# Educational Exploration.

Currently, the Knobtown District does not provide adequate opportunities to engages users in the education of sustainability. The educational opportunities that currently exist in the District are limited to the Metro Green Corridor, Little Blue Trace River and an existing retention pond located at the southern end of the site.

As sustainability has become a mainstream part of everyday life, it is important the spaces within and outside the District reflect sustainable design. These environments should provide users the opportunity to explore, learn, and engage in natural systems and processes.

## *Opportunities*
### *Exisitng Water Retention Area*
- *Create a constructed wetland area with interpretive signage explaining natural processes through text and diagrams*

### *Metro Green Corridor*
- *Connect to Metro Green access points*
- *Create green spines that explore rainwater treatment alternatives*
- *Constructed wetland areas act as recreational amenities providing ecological goods and services*
- *Educate user of sustainable strategies taking place*

### *Little Blue Trace River*
- *Provide areas for users to interact and view natural process.*
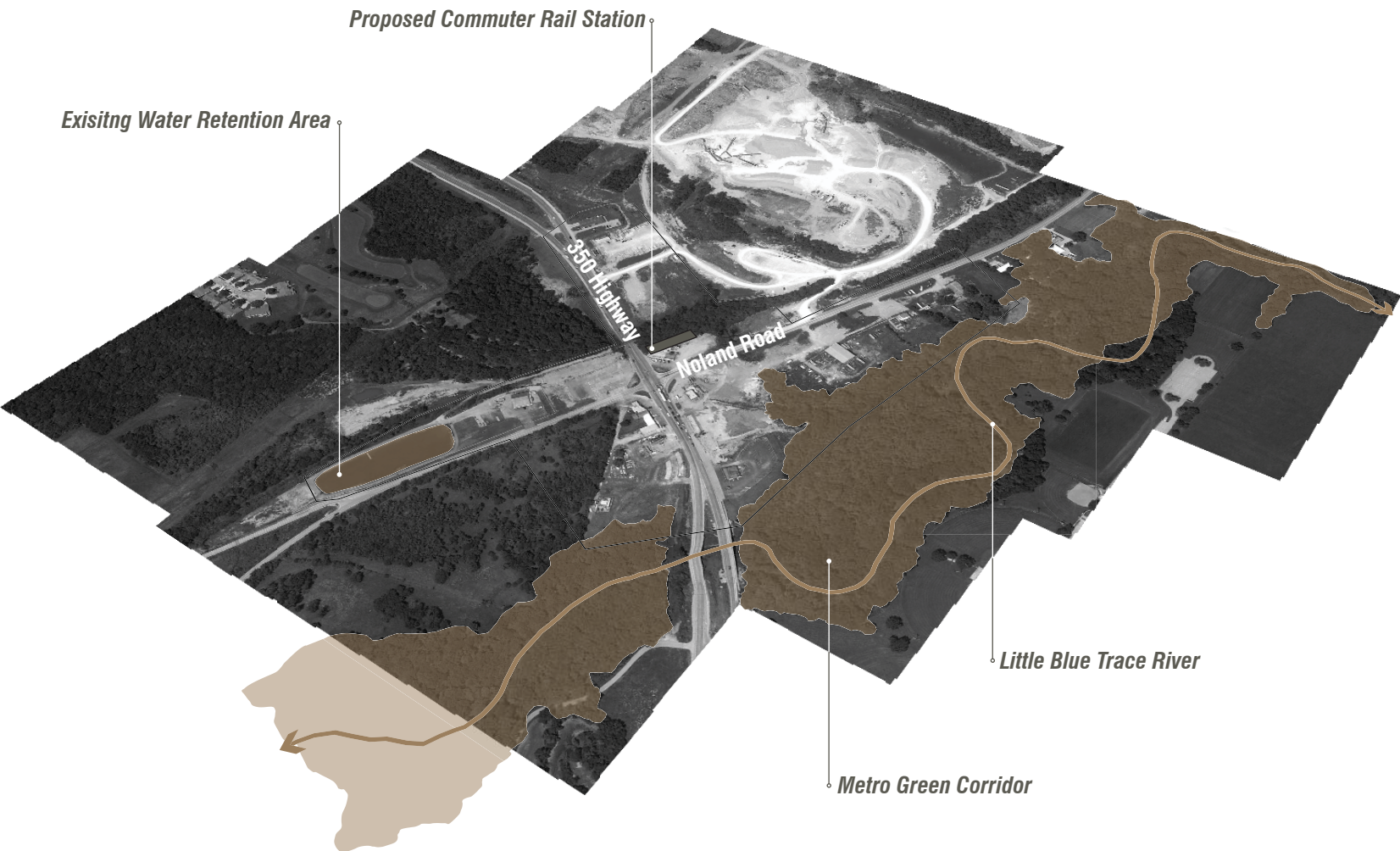
Proposed Commuter Rail Station

Exisitng Water Retention Area

350 Highway

Noland Road

Little Blue Trace River

Metro Green Corridor

Educational Exploration.
[3.9]

**Figure 3.9: Educational Exploration Opportunities.** Highlighted areas indicate zones that present the opportunity for educational exploration.

# Cultural Expression.

The cultural remnants currently in Knobtown reflect on the area in ways that many see as underisreable. It is vital to the existence and success of the area that land uses reflect the goals and values of the project. The objective is to create a Transit-Oriented Development that re-invigorates the vitality of the area stimulating users through a four-part framework. The richeness in development potential of Knobtown also presents endless opportunites to improve upon the culture of the district.

## *Opportunities*

- *Provide a diversity of land uses that establishes a cultural presence along the Rock Island Corridor*

- *Create environments that build a culture rich in sustainable morals and values*

- *Make the Knobtown District a unique desti-nation for residents and users*

- *Provide spaces for human interaction with the natural environment*

Proposed Commuter Rail Station

T-Shirt Market

Hillside Landscape Materials

Winterstone Rock Company

Steve William's Asphalt Company

Rock Island Rail Line

350 Highway

Noland Road

Metro Green

Vacant Building

Battle of White Oak Creek Stone House

Raceway Auction House

Pure Adult Nightclub

Cultural Expression.
[3.10]

Knobtown Liquor

Van City Used Car Dealership

Knobtown Ink Tattoo Parlor

Shelia's Closet Lingerie Store

Figure 3.10: Existing Cultural Remnants.

# Ethical Revelation.

Knobtown is a place where there is presently little reflection on the environment. Although it is currently an undesireable place for development there are numerous opportunities to connect ethically with the environment.

Much like the other principles a majority of design potential rests on the eastern edge of the site. Bounded by the Metro Green Corridor and the Little Blue Trace River creates opportunities to connect into natural systems. These systems can provide spaces to reflect ethically through the observation and interaction with natural processes.

## *Opportunities*

- *Create small scale interventions and interpretations of natural systms*

- *Utilize conventional systems and methods in new ways.*

- *Create elegantly simple design strategies*

- *Create water collection basins as features/ focal points*

- *Create unified design themes by repeating systems*

Proposed Commuter Rail Station

Exisitng Water Retention Area

350 Highway

Noland Road

Little Blue Trace River

Metro Green Corridor
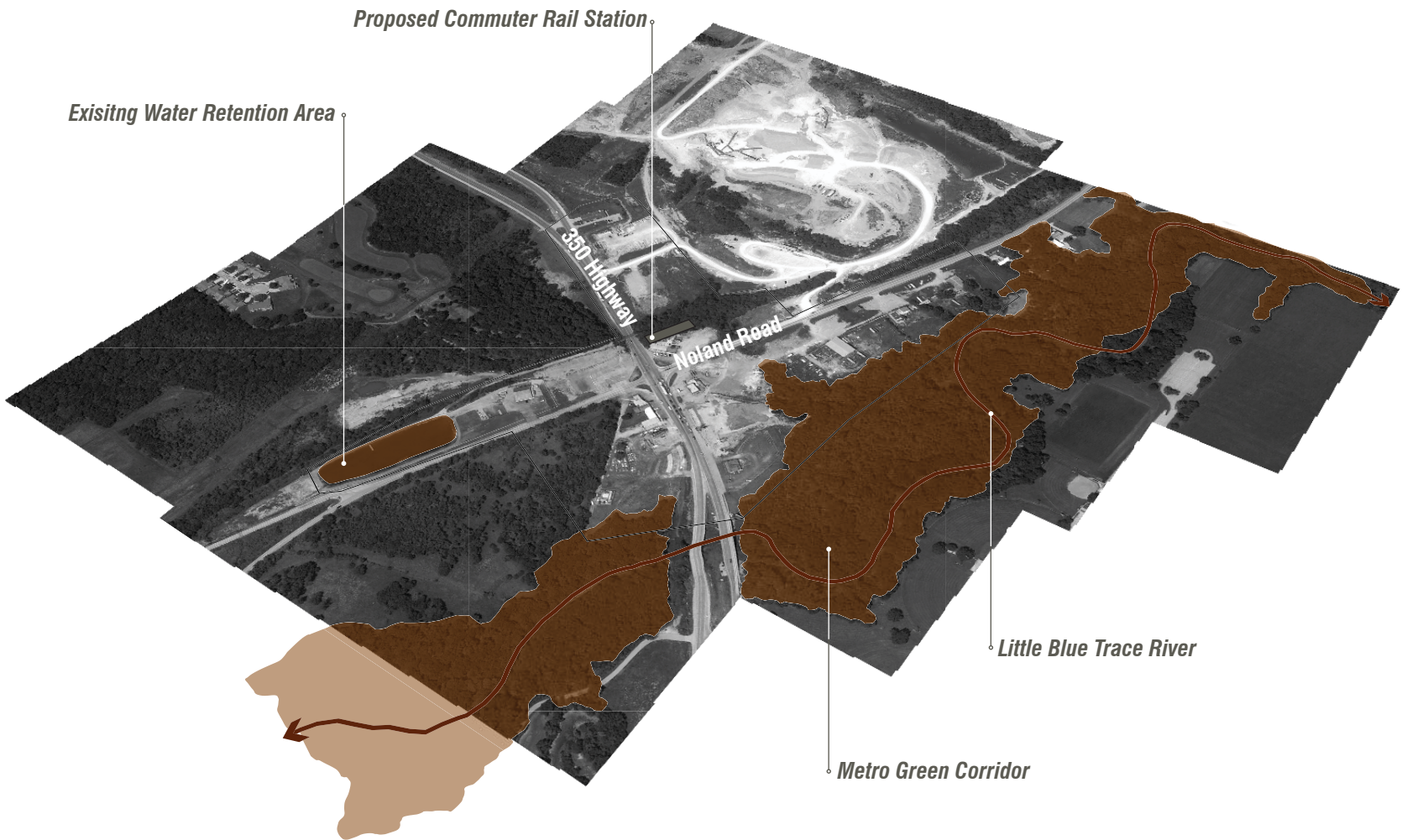
**Ethical Revelation.**
[3.11]

Figure 3.11: Opportunities for Ethical Revelation.
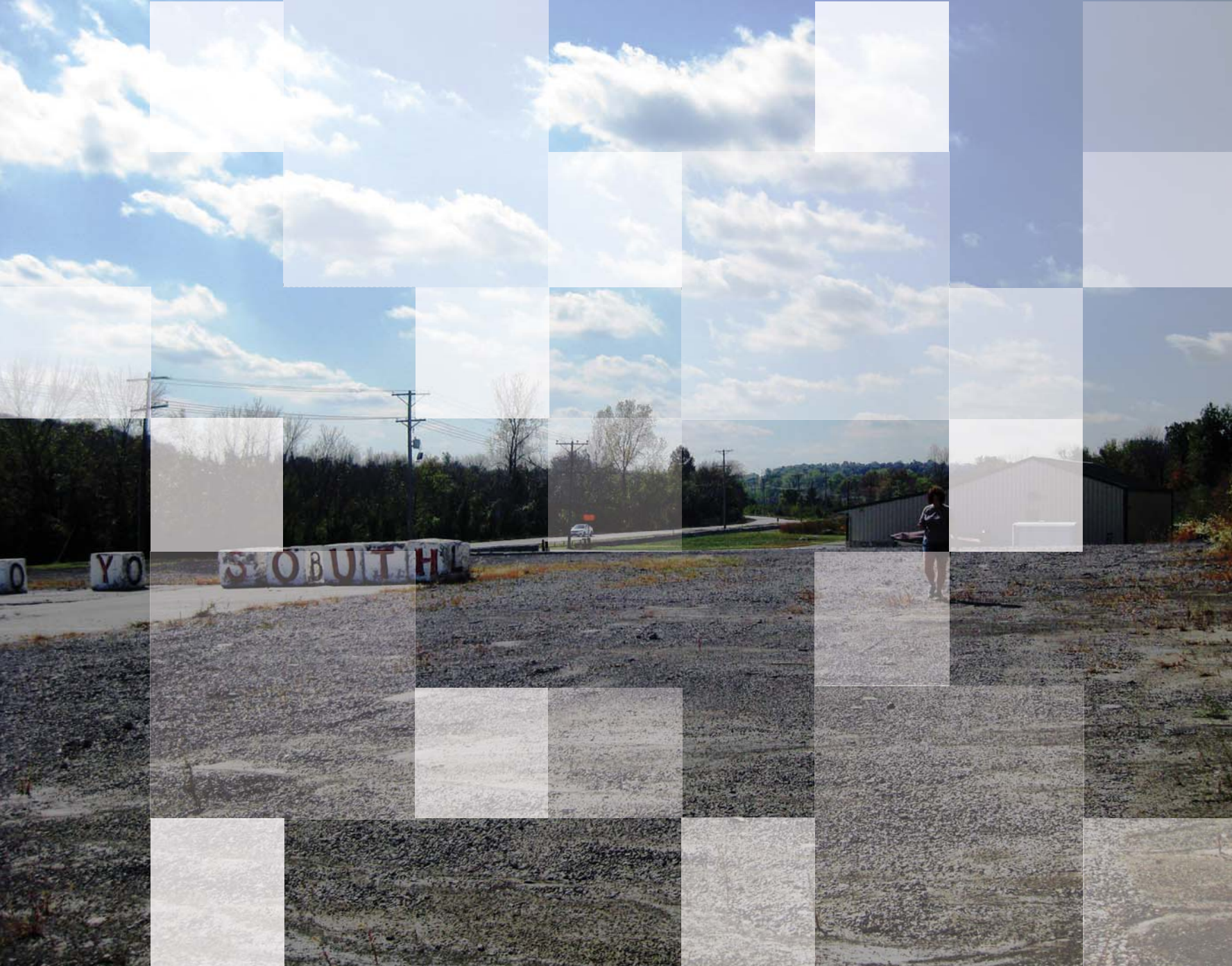
# Design.

This chapter presents design recommendations, solutions, and strategies to achieve sustainability. It will begin by presenting the concept and then introducing the Knobtown District Design identifying development totals and the strategies to achieve the four-part framework. Each strategy is intended to address the key dilemmas that have been addressed in previous chapters of this document.

# Introduction.

Over the past decade it has become increasingly clear that the presence of transit can increase property values and result in valuable development opportunities *[U.S. Department of transportation, 2008]*. In this era of constrained transit funding and widespread demand for new and expanded transit infrastructure, elected officials and policy makers are becoming increasingly interested in harnessing the value that transit can have on development. This idea, known as "value capture," is much discussed in planning and local governments *[Federal Transit Administration, 2008]*.

There is a growing awareness in the U.S. that public transit offers numerous economic, social and environmental benefits. These benefits are directly reflected in a significant increase of property values near transit stations *[Federal Transit Administration, 2008]*. Americans are increasingly prioritizing the advantages provided by neighborhoods near transit stations. These advantages include, but are not limited to: household-to-household economic savings, reduced carbon emissions, and healthier lifestyles. In result, there has been demographic and cultural changes revealing a growing interest in urban lifestyles. These trends are only reinforced by recent spikes in oils and gas prices, placing unwanted stresses on families and businesses. Many local jurisdictions hope to tap into rising property values to encourage Transit-Oriented Development helping to pay for neighborhood improvements such as local infrastructure, improved pedestrian linkages, and affordable housing. Meanwhile, property owners and developers see transit as an amenity that provides increses in surrounding property values.

The Knobtown District has the opportunity to capitalize on many of the contemporary issues that have previously been discussed. With this being said, it is important to understand that the Rock Island Railroad is an important piece of each community along the line, providing the opportunities to connect as a region.

## Design Goals.

**01. Educate** the public about sustainable design strategies that can enrich a user's experience.

**02. Inspire** the Knobtown District and surrounding communities to connect through modes of transporation such as light rail and trail sytems, promoting the importance of green technologies.

**03. Promote** health, safety, and welfare through innovative design solutions.

**04.** Use the aesthetic of the place as a device that **reveals** natural processes, inducing new and positive perceptions of nature and the built environment.

**05. Stimulate** the local and regional economies of Kansas City creating vibrant, and sustainable communities along the Rock Island Railroad.

**06.** Create an environment that reflects on nature and provide areas for **demonstration** of these processes occuring.

**07. Inspire** residents and visitors to reflect on the landscape and the environment in which they are a part of.

**08.** Create a **progressive identity** grounded in design

# Concept Statement.

The Knobtown District is conceptualized as a Transit-Oriented Development that addresses the societal issue of how we address sustainability. Through the introduction of a framework that formulates strategies for creating aesthetic environments that inspire educational exploration, cultural expression, and ethical revelation Knobtown will become a progressive district focused on human experience benefitting local ecologies.

The design solution also strategizes a wastewater purification alternative that addresses the current dilemma of inadequate wastewater infrastructure throughout the region. By designing alternatives competing against conventional wastwater treatment methods, wastewater will be treated by a more environmentally friendly method that reduces infrastructure cost, while providing an aesthetic amenity for users to enjoy and learn.

The conceptualization of this project is intended to show stakeholders a Transit-Oriented Development alternative that will provide the Rock Island Rail Line ridership while also creating a place for people to gather, learn, reflect, and cultures to build.

**Figure 4.1: Knobtown District Illustrative Master Plan.**

Constructed Wetland

Noland Road

Green Spine

Green Spine

350 Highway

Rock Island Railroad

Constructed Wetland

Constructed Wetland

Metro Green Corridor

Constructed Wetland

[4.1]

*Design.*

350 Highway

Rock Island Railroad

| | High Density Residential |
| --- | --- |
| | Office |
| | Retail/ Commercial |
| | Transit |
| | Living Machine |
| | Structured Parking |

NTS

[4.2]

## The Knobtown District Land Use Plan

| Block Section | Building Number | Land Use Type — High Density Residential | Office | Commercial/Retail | Transit | Structure Parking | SF — High Density Residential | SF — Office | SF — Commercial/Retail | SF — Transit | SF — Structure Parking | Total Square Footage | Total Living Machine SF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | 31 units on 3 floors | | | | 62 stalls on 2 floors | 47,198 | | | | 18,600 | 65,198 | |
| | 2 | 13 units on 2 floors | | | | 26 stalls on 1 floor | 20,206 | | | | 7,800 | 32,206 | |
| | 3 | 18 units on 3 floors | | | | 36 stalls on 1 floor | 28,215 | | | | 10,800 | 38,215 | |
| | TOTAL | 95 units | | | | 124 stalls | 95,619 | | | | 37,200 | 135,619 | |
| B | 1 | 27 units on 4 floors | | 5 units on 1 floor | | 115 stalls on 4 floors | 40,364 | | 10,091 | | 34,560 | 85,015 | 11,596 |
| | 2 | 39 units on 4 floors | | 5 units on 1 floor | | | 59,876 | | 11,238 | | | 71,114 | |
| | 3 | 40 units on 3 floors | | | | | 68,646 | | | | | 68,646 | |
| | TOTAL | 106 units | | 10 units | | | 168,886 | | 21,329 | | 34,560 | 224,775 | |
| C | 1 | 28 units on 4 floors | | | | 55 stalls on 2 floors | 56,403 | | | | 26,690 | 83,093 | 11,459 |
| | TOTAL | 28 units | | | | 55 stalls | 56,403 | | | | 26,690 | 83,093 | |
| D | 1 | | | | | 100 stalls on 3 floors | | 9,981 | | | 29,943 | 39,924 | |
| | 2 | 17 units on 2 floors | | | | | 26,176 | 26,176 | | | | 52,352 | |
| | 3 | 30 units on 2 floors | | 8 units on 1 floor | | | 45,459 | 51,441 | 15,796 | | | 112,696 | |
| | TOTAL | 47 units | | 8 units on 1 floor | | | 71,635 | 87,598 | 15,796 | | 29,943 | 204,972 | |
| E | 1 | 33 units on 3 floors | | | | | 51,324 | | | | | 51,324 | |
| | 2 | 38 units on 3 floors | | 3 units on 1 floor | | 48 stalls on 2 floors | 58,952 | | 6,300 | | 14,534 | 79,786 | |
| | TOTAL | 71 units | | 3 units | | 48 stalls | 110,276 | | 6,300 | | 14,534 | 131,110 | |
| F | 1 | 26 units on 2 floors | | 10 units on 1 floor | | | 41,250 | 29,688 | 20,625 | | | 91,563 | |
| | 2 | 20 units on 3 floors | | 11 units on 1 floor | | 67 stalls on 3 floors | 32,852 | 11,269 | 23,140 | | 20,142 | 87,403 | |
| | TOTAL | 46 units | | 21 units | | 67 stalls | 74,102 | 40,957 | 43,765 | | 20,142 | 178,966 | |
| G | 1 | | | 8 units on 1 floor | | 171 stalls on 3 floors | | | 17,135 | | 51,405 | 68,540 | |
| | TOTAL | | | 8 units | | 171 stalls | | | 17,135 | | 51,405 | 68,540 | |
| H | 1 | 24 units on 2 floors | | 2 units on 1 floor | | 56 stalls on 2 floors | 43,307 | | 5,106 | | 16,990 | 65,403 | |
| | 2 | 32 units on 3 floors | | 5 units on 1 floor | | 60 stalls on 2 floors | 61,422 | 8,017 | 10,705 | | 17,616 | 97,760 | |
| | TOTAL | 56 units | | 7 units | | 116 stalls | 104,729 | 8,017 | 15,811 | | 34,606 | 163,163 | |
| I | 1 | 12 units on 2 floors | | 5 units on 1 floor | | 31 stalls on 1 floor | 18,810 | | 9,405 | | 9,405 | 37,620 | |
| | 2 | 22 units on 3 floors | | | | 49 stalls on 2 floors | 34,147 | | | | 14,782 | 48,929 | |
| | 3 | 25 units on 3 floors | | 3 units on 1 floor | | 50 stalls on 2 floors | 43,155 | | 5,996 | | 15,207 | 64,358 | |
| | TOTAL | 59 units | | 8 units | | 138 stalls | 96,112 | 8,017 | 15,401 | | 39,394 | 150,907 | |
| J | 1 | 42 units on 2 levels | | 22 units on 1 floor | | 124 stalls on 4 floors | 69,498 | 18,596 | 44,065 | | 37,312 | 169,471 | 18,596 |
| | TOTAL | 42 units | | 22 units | | 124 stalls | 69,498 | 18,596 | 44,065 | | 37,312 | 169,471 | |
| K | 1 | 45 units on 3 floors | | 17 units on 1 floor | | 140 stalls on 4 floors | 71,993 | 34,919 | 34,919 | | 42,088 | 183,919 | 18,537 |
| | TOTAL | 45 units | | 17 units | | 140 stalls | 71,993 | 34,919 | 34,919 | | 42,088 | 183,919 | |
| L | 1 | 6 units on 1 floor | | 36 units on 2 floors | | | 10,440 | 72,664 | 72,664 | | | 155,768 | |
| | 2 | 26 units on 2 floors | | 30 units on 2 floors | | | 47,164 | | 60,938 | 20,335 | | 158,332 | |
| | TOTAL | 32 units | | 66 units | | | | 72,664 | 133,602 | 20,335 | | 314,100 | |
| M | 1 | 22 units on 2 floors | | 13 units on 1 floor | | | 44,960 | 46,433 | 25,757 | | | 117,150 | |
| | 2 | 40 units on 3 floors | | 24 units on 1 floor | | | 70,151 | 36,378 | 48,481 | | | 151,010 | 24,224 |
| | TOTAL | 62 units | | 37 units | | | 115,111 | 82,811 | 74,238 | | | 268,160 | |
| N | 1 | 54 units on 3 floors | | 20 units on 1 floor | | | 100,131 | 66,811 | 40,290 | | | 207,232 | |
| | TOTAL | 54 units | | 20 units | | | 100,131 | 66,811 | 40,290 | | | 207,232 | |
| O | 1 | 65 units on 1 floor | | 22 units on 1 floor | | 131 stalls on 5 floors | 106,947 | 47,516 | 44,829 | | 39,325 | 238,617 | 22,148 |
| | TOTAL | 65 units | | 22 units | | 131 stalls | 106,947 | 47,516 | 44,829 | | 39,325 | 238,617 | |
| P | 1 | 38 units on 3 floors | | 14 units on 1 floor | | | 66,529 | 24,950 | 29,386 | | | 120,865 | |
| | 2 | | | 8 units on 1 floor | | | | 33,748 | 16,874 | | | 50,622 | |
| | 3 | 60 units on 3 floors | | | | | 119,904 | 62,033 | | | | 181,937 | |
| | TOTAL | 60 units | | | | | 186,443 | 120,731 | 46,260 | | | 353,424 | |
| DEVELOPMENT TOTAL | | 868 residential units | | 249 retail units | | 1,114 parking stalls | 1,485,489 sq. ft. | 553,740 sq. ft. | 588,637 sq. ft. | 50,230 sq. ft. | 407,199 sq. ft. | 3,055,733 sq. ft. | 106,560 sq. ft. |

[T4.1]
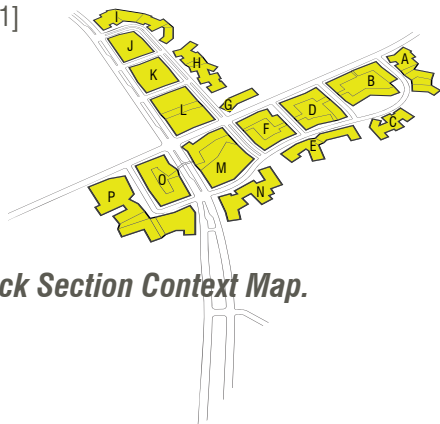


*Block Section Context Map.*
[4.3]

**Figure 4.2: Land Use and Development Plan.** A diagrammatic representation of land use throughout the Knobtown District.

**Table 4.1: Knobtown Land Use Plan Square Footage.** This table identifies the total development area.

**Figure 4.3: Land Use Block Sections.** The development is divided into block sections for ease of building square footage calculations.

**106,560 SF**
of LIVING MACHINE space

**3%**
of developed site

**20,335 SF**
of TRANSIT ORIENTED space

**1 %**
of developed site

**868** Residential Units at a total of

**1,485,489 SF**

**46%**
of developed site

**553,740 SF**
of OFFICE space

**18%**
of developed site

**588,637 SF**
of COMMERCIAL + RETAIL space

**19%**
of developed site

**1,114**
structured parking stalls

+ **407,199 SF**

**13%**
of developed site

**3,162,293 SF**
of TOTAL *DEVELOPMENT FLOOR AREA*

[4.4]

*Living Machine*

*Transit*

*High Density Residential*

*Office*

*Commercial + Retail*

*Structured Parking*

*Road Network*
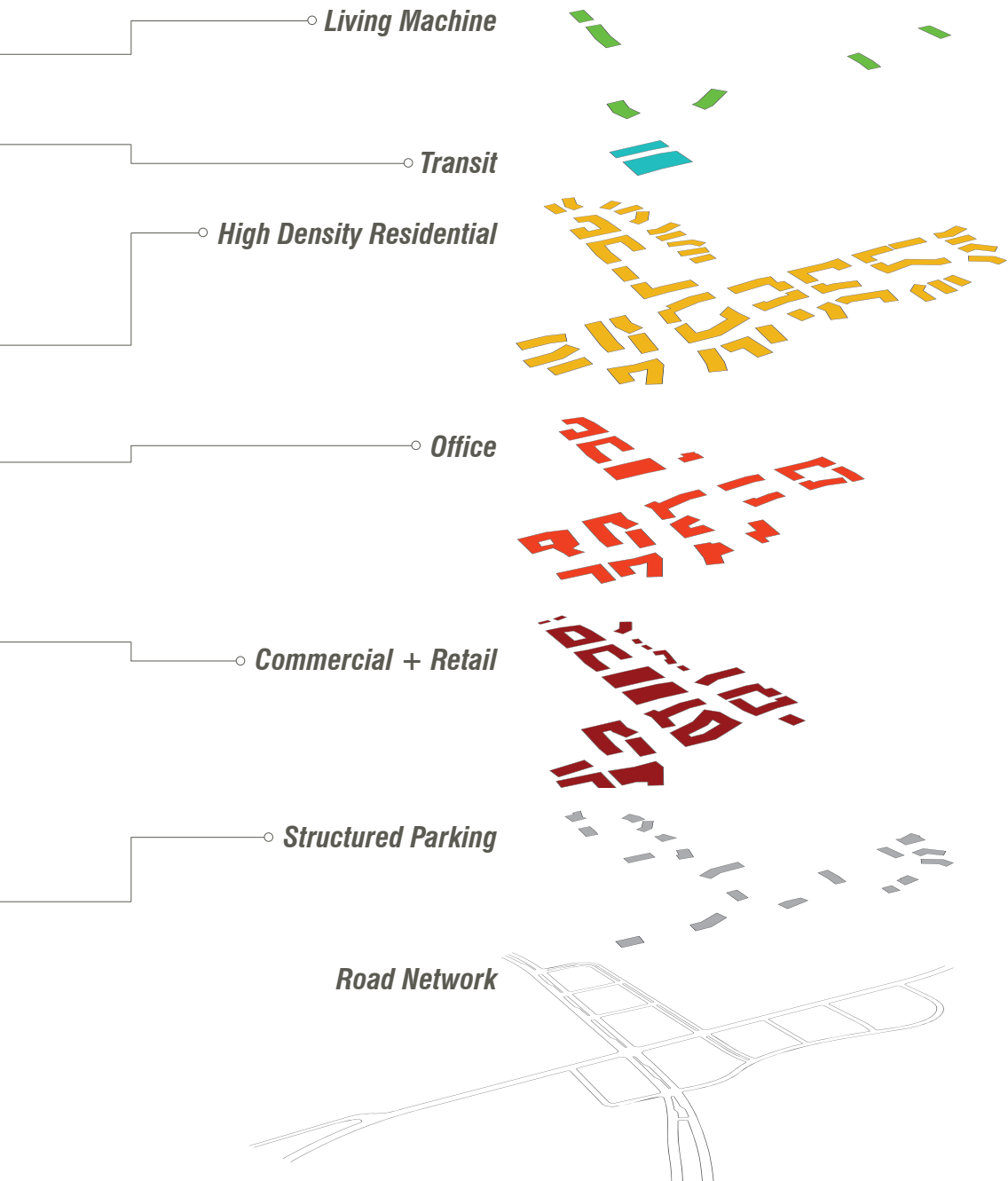
**Figure 4.4: Knobtown Development Totals.** This figure identifies the area of each land use type in relation to the the total development of Knobtown.

## Traffic Strategies Will Increase Accessibility in the Knobtown District.

Traffic strategies will ensure fluid movement throughout the development. It is essential to the prosperity of the Knobtown that the district is easily accessible by numerous transportation alternatives. These alternatives range from pedestrian foot traffic, to bike, vehicle, and public transit. Each street strategy is intended to accommodate multi-modal transportation options.

The proposed traffic solutions are several strategies to be considered when thinking about a users experience. It is important that the user is comfortable. By implementing a building height strategy along wide boulevards and access roads, a comfortable human scale is achieved. The building height alongside 350 Highway and Noland Road correlate

directly with commercial and retail spaces intended to encourage people to stop at Knobtown. Consequently, with wider, more dominant access roads comes higher traffic speeds. Two strategies have been identified to help slow traffic and provide a safer environment for the pedestrian and bicyclist. These strategies include the implementation of strategic stoplight placement along higher density access roads, as well as paving pattern strategies to help slow traffic to increase usability.

It is important that these strategies work hand-in-hand while also providing enough parking for vehicular traffic. These strategies become evident along secondary access roads where on-street parking is provided. Also, structured

parking has been implemented throughout the development providing other opportunities for users to safely access the development. Parking should not dominate pedestrian space. Retail uses should be encouraged on the first floor of street-side edges of parking structures. Parking structures that do not have first floor retail uses should have the appearance similar to surrounding structures.

### Objectives

○ *Provide safe and adequate alternatives to help slow traffic*

○ *Maximize parking while also minimizing the visibility of vehicles.*

○ *Create a pedestrian and bicyclist friendly environment*

**Traffic Strategies.**
[4.5]

**Parking Strategies.**
[4.6]

**Figure 4.5: Traffic Strategies.** In order to adequately address traffic it is essential to develop traffic strategies.

**Figure 4.6: On-street and Structured Parking.**

*Design.*            _070

## CIrculation Patterns Influence Pedestrian Comfort.

The Knobtown District provides comfortable access for the pedestrian. Slowing traffic in Knobtown is desired creating safer and more comfortable pedestrian and bicycling environments. Minimum street dimensions are intended to create a more intimate scale while providing for large vehicles and municipal service vehicles. The dimensions of the main arterials, 350 Highway and Noland Road, have been widened to four lanes minimizing traffic congestion.

Comfortable sidewalks reinforce pedestrian environments within Knobtown. The comfort and convenience of easily accessible amenities will reduce internal auto trips and reinforce the efficiency of the transit system by creating destinations that are easily attainable without a car.

"Up to 75 percent of all household trips are non-job related." *[Calthorpe 1992, 70].* Many of these non-commmunte trips can be captured within the TOD or within a short transit connection. Transit passengers are likely to make frequent street crossings, some at mid-block, others at vital intersections and pedestrian crossings. The interruptions in the path and inconvenient walking routes discourage pedestrian travel. Pedestrian access is critical to the displacement of auto trips within Knobtown.

Metro Green spines act as safe routes into and out of the development. These streets and pedestrian thoroughfares separate the pedestrian from any danger associated with vehicular traffic. The green spines also act

as watershed treatment areas. Surface flows are directed into drainage swales where water is filtered and infiltrated before it reaches the Little Blue Trace River..

Connector streets are intended to carry a majority of the developments vehicular traffic. The design and alignment balances efficient vehicular travel with the safety and livability of residential areas. Minimizing the width travel lanes and using on-street parking, 'dog legs' and 'T-intersections' slow traffic and offer a pleasing streetscape. Providing a connector network with frequent, alternative paths will distribute traffic volumes over more routes. These streets are lined with housing options, stores, and small businesses providing an environment oriented towards the pedestrian.
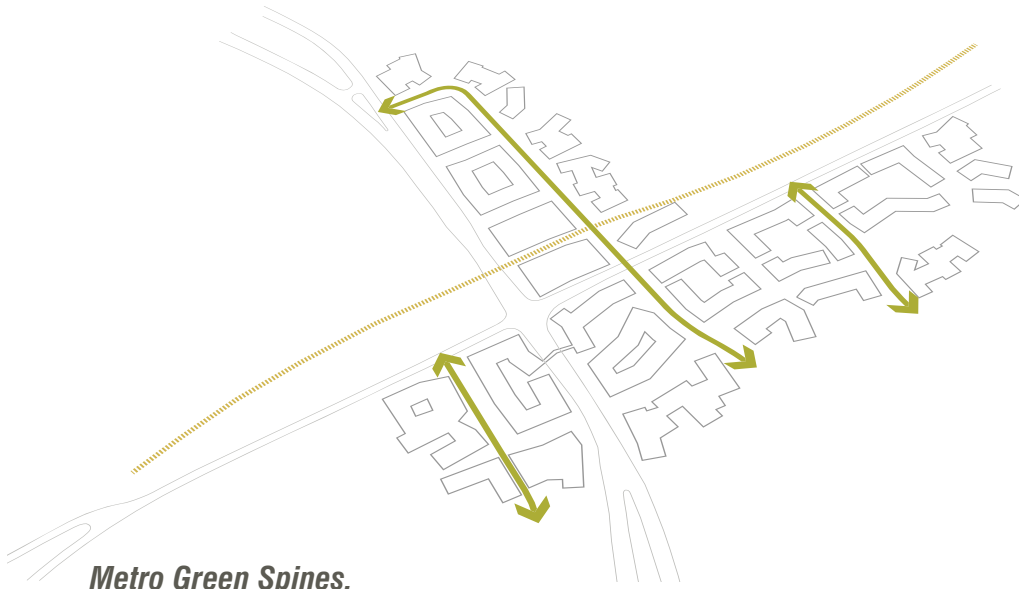
**Metro Green Spines.**
[4.7]

**Vehicular Circulation.**
[4.8]

**Figure 4.7: Metro Green Spines.** Green spines connect the interior of the Knobtown to the Metro Green Corridor.

**Figure 4.8: Vehicular Circulation.**

**Section Context Map.**
[4.9]



12' sidewalk

Two lane street with parallel parking on either side

12' sidewalk

10' platform

Proposed commuter rail

10' platform

18' bus loading zone/ sidewalk

Noland Road 4 lanes 48' wide

12' sidewalk
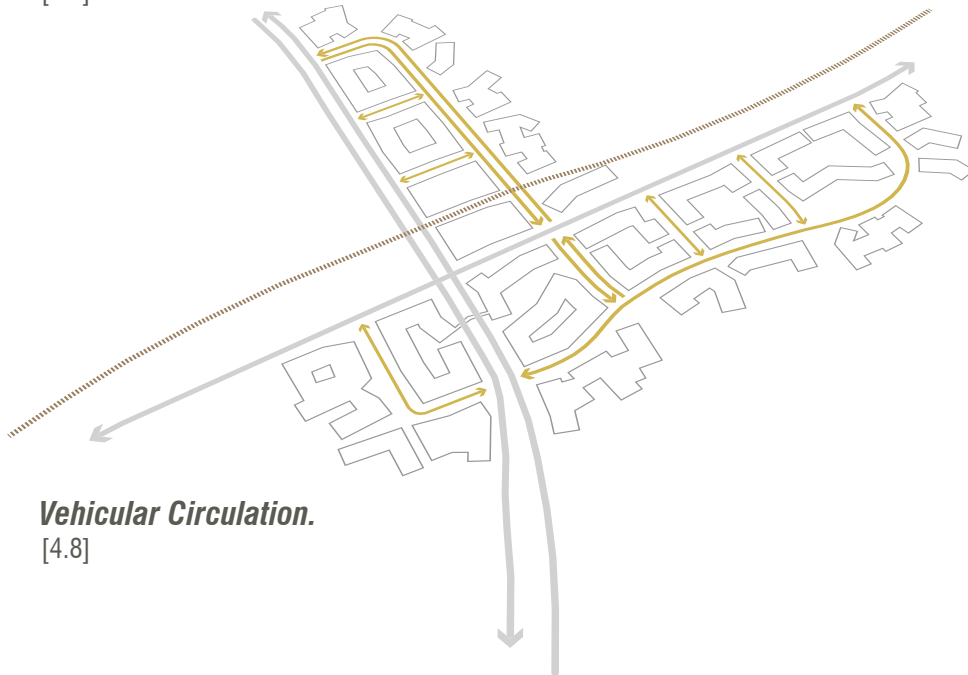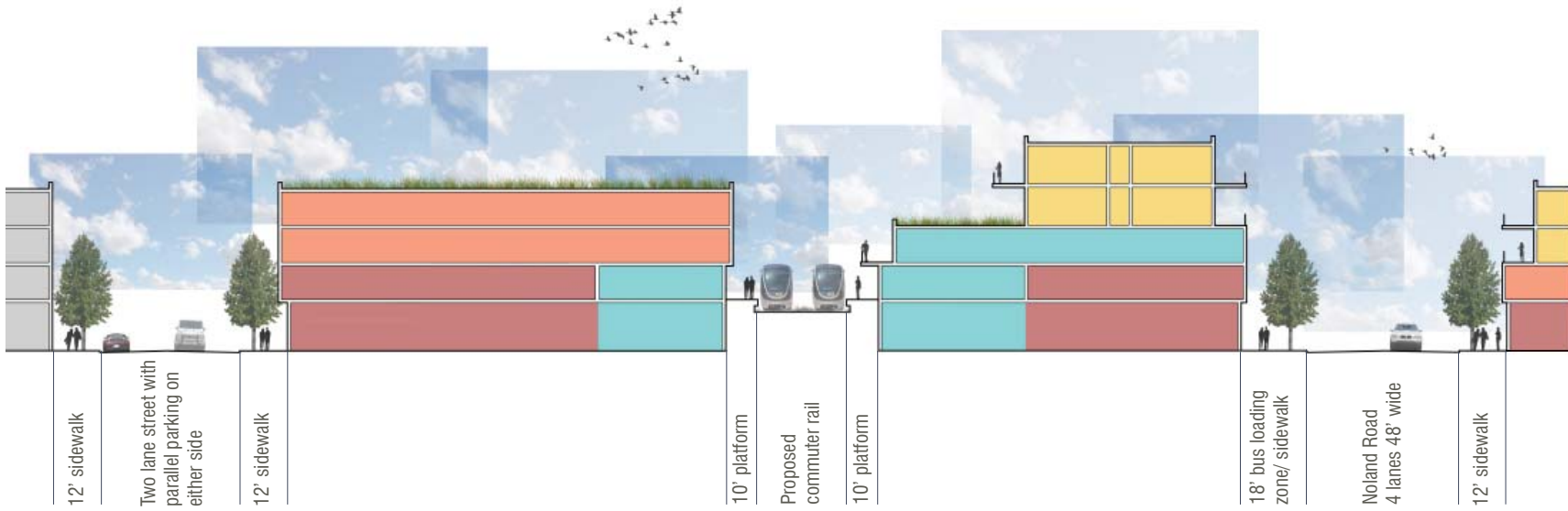
***Section 'A' Looking North on Noland Road Through Transit Station.*** **NTS**
[4.10]
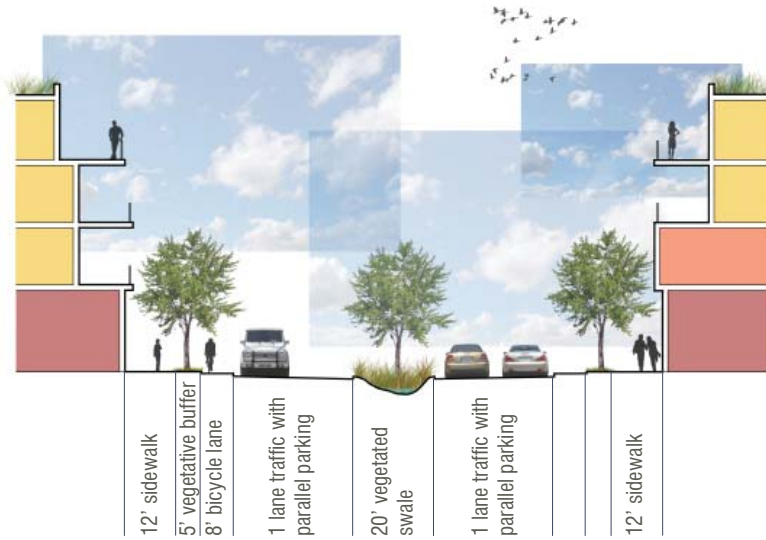
**Section 'B' Looking west through Green Boulevard.** *NTS*
[4.11]

Labels (left to right):
- 12' sidewalk
- 5' vegetative buffer
- 8' bicycle lane
- 1 lane traffic with parallel parking
- 20' vegetated swale
- 1 lane traffic with parallel parking
- 12' sidewalk
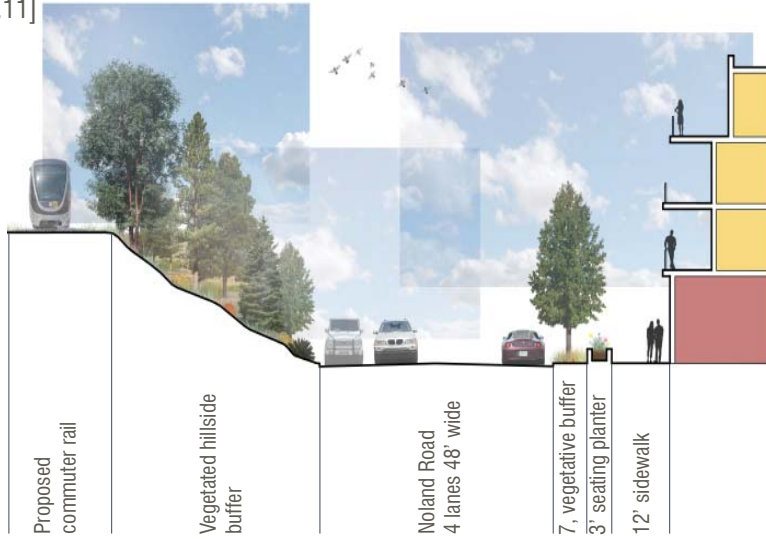


**Section 'C' Looking North Through Rail Line on Noland Road.** *NTS*
[4.12]

Labels (left to right):
- Proposed commuter rail
- Vegetated hillside buffer
- Noland Road 4 lanes 48' wide
- 7, vegetative buffer
- 3' seating planter
- 12' sidewalk

**Figure 4.9: Site Context Map.**

**Figure 4.10: Section Through Transit Station.** Buildings provide a transitional space to the elevated platform and commuter rail line.

**Figure 4.11: Section Through Green Boulevard.** Green boulevards act as an site orientation device for users, and infiltration zones for stormwater.

**Figure 4.12: Section Through Rail Line.** Edge conditions allow for vegetated screening of the commuter rail line.

# Stormwater Strategies Provide Ecological Amenities.

"The concept of "artful rainwater design" is based on the premise that new stormwater management techniques focus on non-point source pollution, water balance, and small storm hydrology can also be used to create new site amenities." *[Echols 2008, 1].*

The proposed stormwater solutions are presented in a way that gives the opportunity for natural processes to be replicated and exploited. These stormwater amenities become a way to engage, educate, and even entertain users. The ideas presented through these amenities "may be gleaned directly from the design as a specific "lesson learned" or, less didactically, as enriched experience of place." *[Echols 2008, 3].* The intentions behind these techniques are not just merely

to address stormwater management issues, but engage the user in how these can be seen as ecological and social amenities. Through interaction and aesthetics, users will begin to understand the processes that occur in natural environments. Perhaps one of the most important elements, aesthetic richness creates experiences that focus on the beauty and pleasure these amenities create.

Dealing with rainwater runoff strategically and effectively is of paramount importance to property owners and developers who are challenged with managing stormwater on site. It is of utmost importance that we provide inspiration and vision to make rainwater a focal point of beauty, interesting users to live and visit Knobtown *[Echols 2008].*
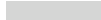
### Objectives

- *Locate systems near enteries, courtyards of window for high visibility.*

- *Do not collect stormwater in large centralized location*

- *Provide clear signage or exhibits with brief text and clear graphics.*

- *Include a variety of stormwater systems in design.*

- *Create visual interest by varying appearance of stormwater treatment components.*

- *Create small replicable interventions*
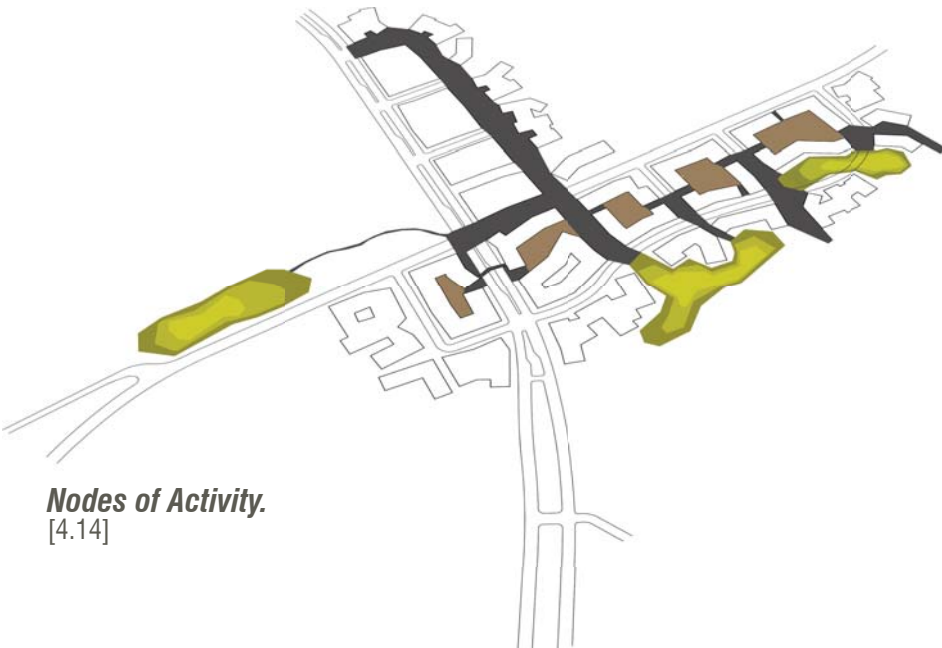
**Stormwater Management Strategies.**
[4.13]

**Nodes of Activity.**
[4.14]

**Figure 4.13: Stormwater Management Strategies.**

**Figure 4.14: Nodes of Activity.** These spaces become places where events occur and human interactions with nature are intended.

**Existing Conditions at the intersection of 350 Highway and Noland Road.**



[4.15]

Figure 4.15: Exisitng Conditions at the Intersection of 350 Highway and Noland Road.

# Constructed Wetland Areas Act As Social Amenities to Benefit Local Ecosystems.

The Knobtown District has the opportunity to take a multi-functional approach to gaining water quality, open-space, recreational benefits and educational opportunities. Similarly to the Living Machine concept, wetlands are natural receptacles. Occurring in low lying areas, wetlands receive rainwater runoff from streets and rooftops and other hardscape surfaces. Wetlands use biologic processes to treat inflows. These mechanisms trap sediments and break down a wide range of pollutants into elemental compunds. As constructed wetlands provide ecological services, they also provide a social amenity for the betterment of the community. As highlighted earlier, wetlands provide the opportunity for education, ethical reflection, and cultural adaption.

This method of rainwater treatment provides a model for the future that allows people to function within a setting that is providing the environment ecological goods and services.

*Interpretive signage facilitating education and environmental ethic*

*Rock Island Commuter Line*

*Trail network interlaced with wetland and natural areas*

[4.16]

*Constructed Rainwater drainage wetland*

*Educational opportunities for local schools and environmental organizations*

*Montage Context Map.*
[4.17]

*Transit Station is placed at the intersection of 350 Highway and Noland Road for easy vehicular access*

*Commuter Rail bridge provides gateway to southeastern Kansas City*

*Easy access to commerical and retail businesses from rail line*

*Proposed bus routes converge at Transit Station*

*Passive recreation opportunities: bird watching, photography, insect collecting*
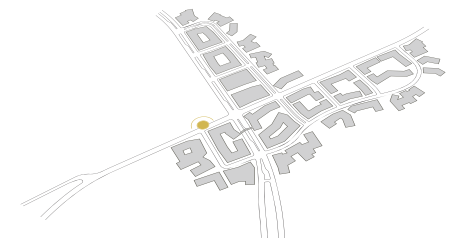
Figure 4.16: Constructed Wetland Area at the Intersection of 350 Highway and Noland Road.

Figure 4.17: Montage Context Map
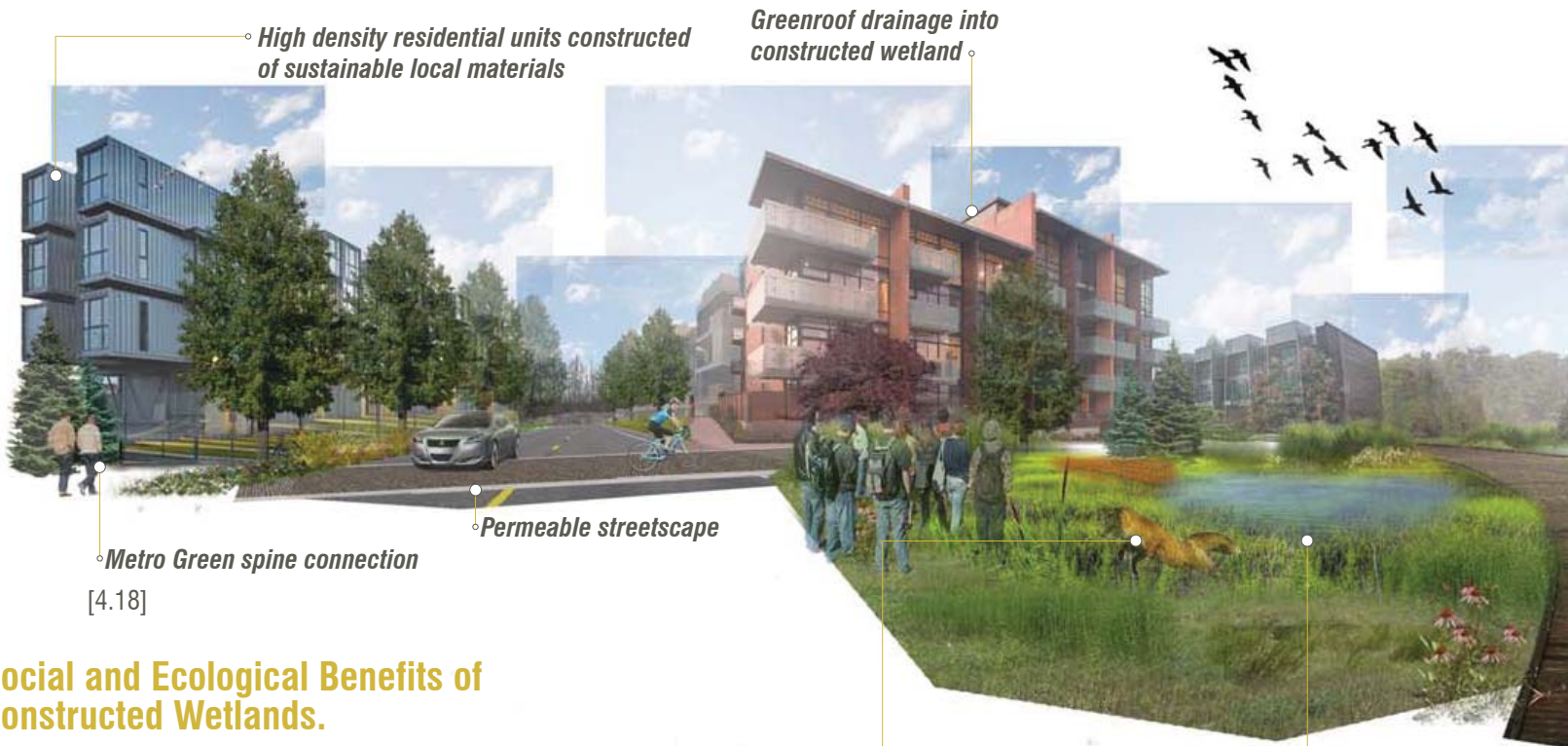
High density residential units constructed
of sustainable local materials

Greenroof drainage into
constructed wetland

Metro Green spine connection

[4.18]

Permeable streetscape

Constructed Rainwater
drainage wetland

Restored wildlife habitat

## Social and Ecological Benefits of Constructed Wetlands.

- Water quality improvement
- Flood storage and infiltration of storm water and surface runoff
- Cycling of nutrients and other materials
- Provides wildlife habitat
- Improves quality of local surface waterways
- Provides passive recreation, such as bird watching and photography
- Education and research
- Aesthetics and landscape enhancements

Vehicular bridge provides
unobstructed access for wildlife

Metro Green Corridor

Reclaimed storage units act as cost
effective residential units

Natural areas for education
and recreation

Recreational trail networks connect to
Metro Green trail system

Interpretive signage facilitates
education of natural processes
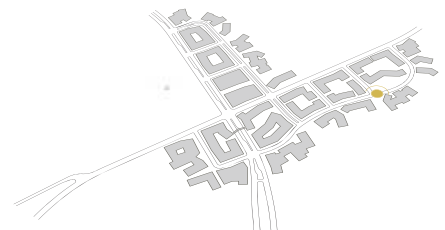
**Montage Context Map.**
[4.19]

Figure 4.18: Constructed Wetland Area at North End of the
Knobtown District.

Figure 4.19: Montage Context Map.

## Inadequate Infrastructure Presents Regional Issues.

The massive problems facing water and wastewater infrastructure are the subject of a growing body of knowledge. In effect, areas across the nation are experiencing significant issues ranging from water main breaks to overflowing sewer systems. The current status of our infrastructural systems are unavoidably deteriorating, leading to failure and costly improvement projects. In addition, many areas and regions are experiencing potential growth due to contextual reasons as well as population and culture change. The Knobtown District is one of these places, lying adjacent to a potential commuter rail gives the area a high potential for development. However, the area is unable to adequately provide for a development of any substantial scale. Similarly to locations around the world,

treatment facilities are becoming overloaded due to the expansion of infrastructural systems. "According to the American Society of Civil Engineers (ASCE), not only does the United States water infrastructure receive a D-rating, but they estimate to upgrade the drinking and wastewater systems across America would require a total investment of $255 billion." *[Kirksey 2009, 3].*

### Demands are Rising.
As water consumption increases the stresses on current systems continue to grow. These current systems were designed as centralized pieces that in many cases are unable to take the demands of additional capacities. According to the United States Department of

Energy projections, energy and water demands are projected to rise at astronomical rates in the next decade. In effect, conventional technologies will become underperforming leaving the expansions of these systems as the only option. Upgrading and building new infrastructure will not only become costly to tax payers, but also the environment will remain in jeopardy.

The centralized model is one that processes wastewater on a site that in most cases, is not situated in a location that minimizes the distance water travels to and from the source. In a system such as this, water travels long distances to treatment facilities out of the public view leading to high infrastructure

and energy costs." The current conventional wastewater treatment model is energy intensive, complex and inefficient." *[Kirksey 2009, 6]*.

Historically, this solution made great strides in wastewater treatment, however, within recent history this technology is becoming out dated and underperforming. Centralized treatment systems are reaching the point of no returns; our resources are becoming limited, and diposal of harmful by-products can not safely be disposed *[Kirksey 2009]*.



**Figure 4.20: Conventional Wastewater Treatment Containment Cells.**

**Figure 4.21: Conventional Wastewater Treatment Facility.**

# Sustainable Wastewater Treatment

The idea of utilizing wetland ecosystems to treat polluted water was first conceived by Dr. Kathe Seidel in the early 1950s. Seidel was a biologist at the Max Plank Institute where he often conducted experiments that used plants and other microorganisms to clean waste water. This technology proved to be more effective than many of his colleagues had perceived *[Worrell 2008]*.

The over-arching idea was taken by numerous ecological designers throughout the 1970s and 1980s. One of whom was Dr. John Todd, who reworked  Seidel's theory and developed the Living Machine system. The new technology, "sought to marry technology with natural processes to create environmentally responsible alternatives to treating wastewater." *[Worrell  2008, 1].* The newly remastered Living Machine® systems presented a level of sophistication never before seen, however, did not achieve a cost effective, consistent treatment pattern.

After much research Tom Worrell invested in Todd's concept of the Living Machine. He set a goal for the system, stating that the system should not have to rely on activated sludge to treat wastewater. Worrell created a Living Machine® wetland system that used microorganisms, wetland plantings, and other control systems to produce a high quality of treated water that did not generate hazardous sludge [Worrell  These wetland ecosystems use living organisms to treat and maintain the integrity of the system.

In addition, the Living Machine® system is very scalable and can be tailored for any application. *Figure 4.22* shows the versatility of the system which is human friendly on interior and exterior applications.
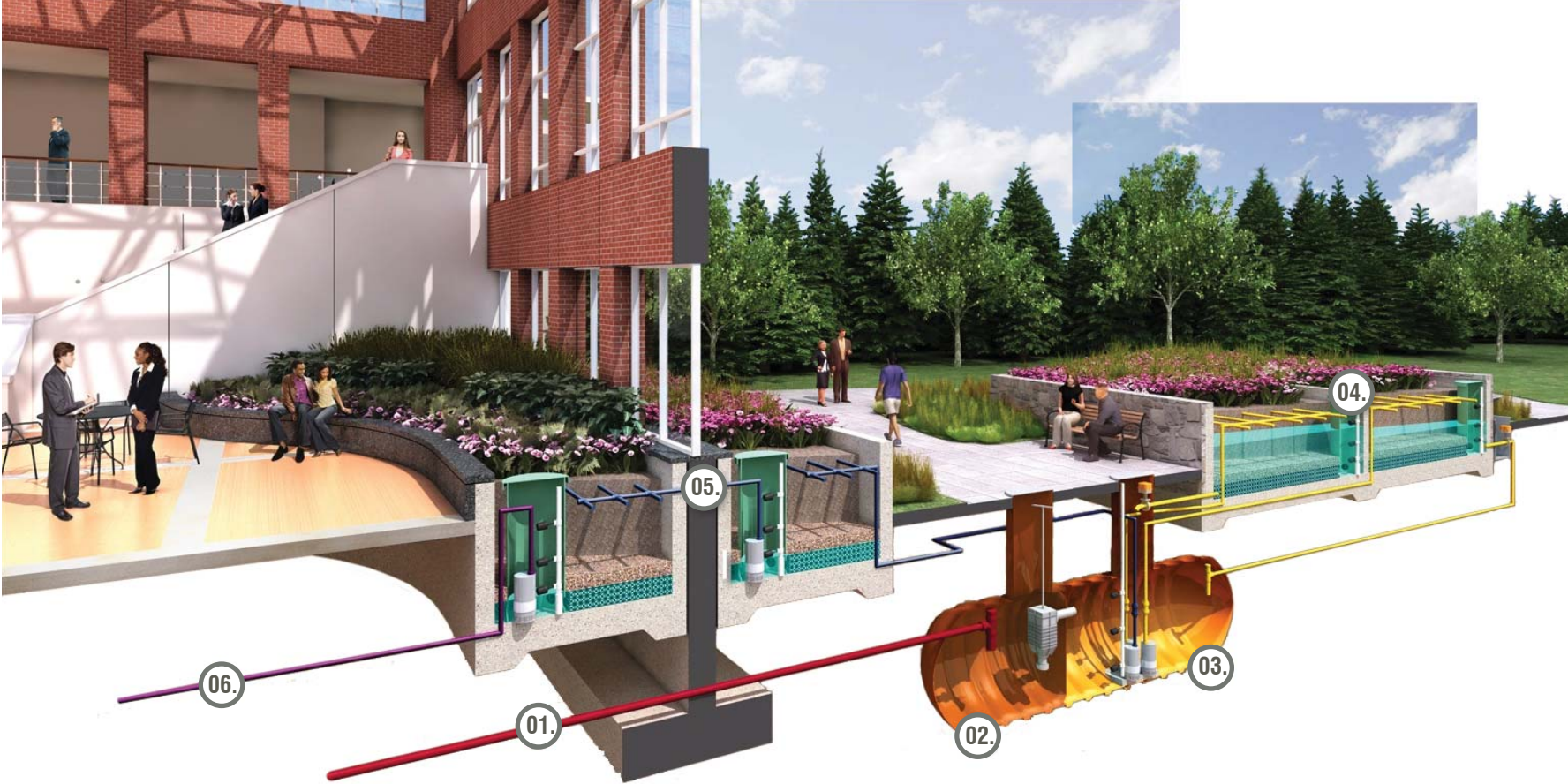
| 01. | 02. | 03. | 04. | 05. | 06. |
|-----|-----|-----|-----|-----|-----|
| Influent Blackwater or Grey Water | Primary Tank | Recirculation Tank | Stage 1: Tidal Flow Wetland | Stage 2: Vertical Flow Wetland | Effluent Reuse for Toilets, Irrigation, Cooling Towers |

[4.22]

**Figure 4.22: The Living Machine® Process.** The basic structure and process of a living machine wastewater treatment system.

# The Living Machine® vs. Conventional Wastewater Treatment Technol-

As water demands rise, so will the cost of it as a resource. "Rather than expend the energy and dollars to transport clean water many miles to a location, only to pump it out and send water again many miles away for sewage treatment, the Living Machine® allows for on-site, local water recycling, producing freshwater for irrigation, toilet flushing, industrial processes, and other uses." *[Worrell 2008, 4].* The Living Machine® is a cost-effective wastewater alternative that can be used in all scales of development.

Living machine systems not only speed up the natural process of a tidal wetland, but have aesthetic and biological advantages over other on-site treatment systems. These systems provide the performance, control and monitoring benefits of any state-of-the-art engineered system. The Living Machine®

system offers distinct benefits when compared to both constructed wetlands and conventional on-site technologies such as water treatment plants.

### *Benefits of the ecologically sensitive Living Machine®*

**01.** "Reduced need for long distance piping, pump stations and associated infrastructure"

**02.** "Better ability to meet demands as they arise, rather than having to build large systems with long lead times to handle forcasted future demands"

**03.** "Reduced need for system maintenance and sludge disposal into landfill areas"

**04.** "Ability for the dual uses of land, thereby reducing the need for large tracts of land unusable for any other purposes"

**05.** "Lower operating cost due to low energy and labor requirements compared to conventional systems"

**06.** "Lower construction cost using local skills and materials for many of the technologies"

*[Worrell 2008, 11].*

| The Living Machine -- Benefits over Conventional Wastewater Technology | | |
|---|---|---|
| | Living Machine | Conventional Technologies |
| **Energy** | | |
| Primary Source | The sun | Fossil fuels and nuclear power |
| Secondary Source | Radiant energy | Internal biogenesis of gases combustion and electricity |
| Control | Electricity, wind, and solar electric | |
| Capture of External Energy | Very intrinsic to the design | Very rare or none ar all |
| Efficiency | Low biological transfer in subsystems, high overall aggregate efficiency | High in best technologies, low, when total infrastructure is calculated Inflexible |
| Flexibility | In flexible in regards to sunlight, flexible with alternate energy sources | |
| Pulses | Tolerant and adaptive | Usually intolerant to sudden change |
| **Design** | Ecology is the scientific basis for the design Structurally simple Complex living circuit of organisms and bacteria  Dependent entirely upon  environmental energy and internal storage systems   Passive, few moving parts Long life span…Centuries Materials and plants can easily be replaced for a generally low cost | Hardware based Structurally complex Multiple moving parts Energy Intensive  Chemistry is the basis for engineering Physics is important for the mechanical engineering Short life span…decades Recycling is usually not present |
| **Materials** | Transparent climatic shells, open wetlands and storage tanks flexible lightweight containment materials electrical and wind powered air compressors/ pumps | Primarily steel and concrete Heavily reliant on mechanics and motors structurally intensive and large in size |
| **Biotic Design** | Ecosystems that are base on the principles of photosynthesis Components are living organisms There are multiple seedings and plantings to be established Internal driven Help to drive sub-ecosystems or surrounding ecosystems self-sustaining Products of design include: the production of fuels, food, waste purification, living materials, and climate regulation | Independent to sunlight Does not use natural process for purification |
| **System Controls** | Primarily an internally focused system of complex living circuits Modest use of electic and gas inputs for environmental sensors and computer controls Diease and harmful bacteria are internally controlled through competition and antibiotic production A number of organisms are used to sustain control Raw material fueling machine both internally and externally All phylogenetic levels from bacteria to vertebrates acting as control mechanisms | Electrical, chemical, and mechanical controls applied to system Sophisticated control engineering    Raw materials fueling maching are external System must constantly be monitored by educated employees |
| **Management and Repair** | occasional replacement of plant material  removal of accumulated algae Periodically clean the sand removal system | Specialists needed to maintain, repair, and control systems High flexibility in wastestreams can cause high spikes in the amount of reagent requirements Periodically activating the sludge pumps |
| **Pollution** | Pollution, if occurs an indication of incomplete design  natural material selection help to reduce the occurance of pollutants to leak into the system toxic materials and disease infested materials are delt with below the surface, going through a series of natural reactors. | Pollution is a by product; system lacks technologies that capture pollutants  Negative or neutral environmental impact Metallic constituents added by usage. Many metals are also classified as priority pollutants Suspected carcinogenicity, mutagenicity, teratogenicity, or high acute toxicity. Many priority pollutants resist conventional treatment methods (often known as refractory organics) communicable diseases |
| **Cost** | Capital costs are competative with conventional technologies Fuel and Energy costs are nearly cut to zero  Labor costs -- still to be determined? lower pollution control cost Operation costs lower because of cut in chemical and energy input Potential reduction of social costs, in part due to the potential for transferability to less industrialized regions | high cost in labor, treatment reagents and sludge removal Installation costs (38% over basic equipment costs)  high cost in materials, energy, and the replacement of equipment and parts Capital intensive High operation budgets |

**Table 4.2: Comparison of Living Machine and Conventional Wastewater Treatment.** A comparison was compiled and organized to identify the benefits of a Living Machine System over a Conventional Wastewater Treatment System.

[T4.2]

There is an average of **2.59** people per  in the United States.
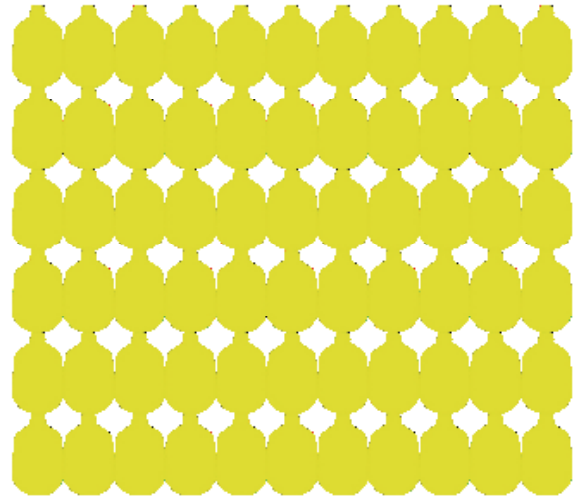
The average person uses between
*40 and 60 gallons of water per day.*

[4.23]

An average household will use *100* gallons of water per day.

*Drinking*
*Bathing*
*Cooking*
*Toilet Flushing*
*Washing Clothes*
*Washing Dishes*
*Brushing Teeth*
*Water Lawn and Gardens*
*Shaving*

[4.24]
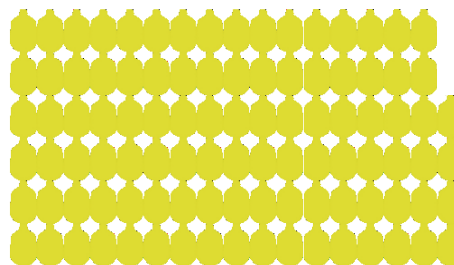
**Figure 4.23: Average Water Usage Per Person in the United States.**

**Figure 4.24: Average Water Usage Per Household in the United States.**

TRANSIT ORIENTED space produces roughly

**16,500 gal./ day**

of wastewater

**868** RESIDENTIAL UNITS produce roughly

**86,500 gal./ day**

of wastewater

OFFICE space produces roughly

**29,500 gal./ day**

of wastewater

COMMERCIAL space produces roughly

**145,000 gal./ day**

of wastewater

RETAIL space produces roughly

**29,000 gal./ day**

of wastewater

**306,500 gal./ day**

of TOTAL *DEVELOPMENT water usage*

[4.25]

*Transit*
*20,335 SF*

*High Density Residential*
*1,485,489 SF*

*Office*
*553,740 SF*

*Commercial + Retail*
*176,591 SF of Commercial*
*412,045 SF of Retail*
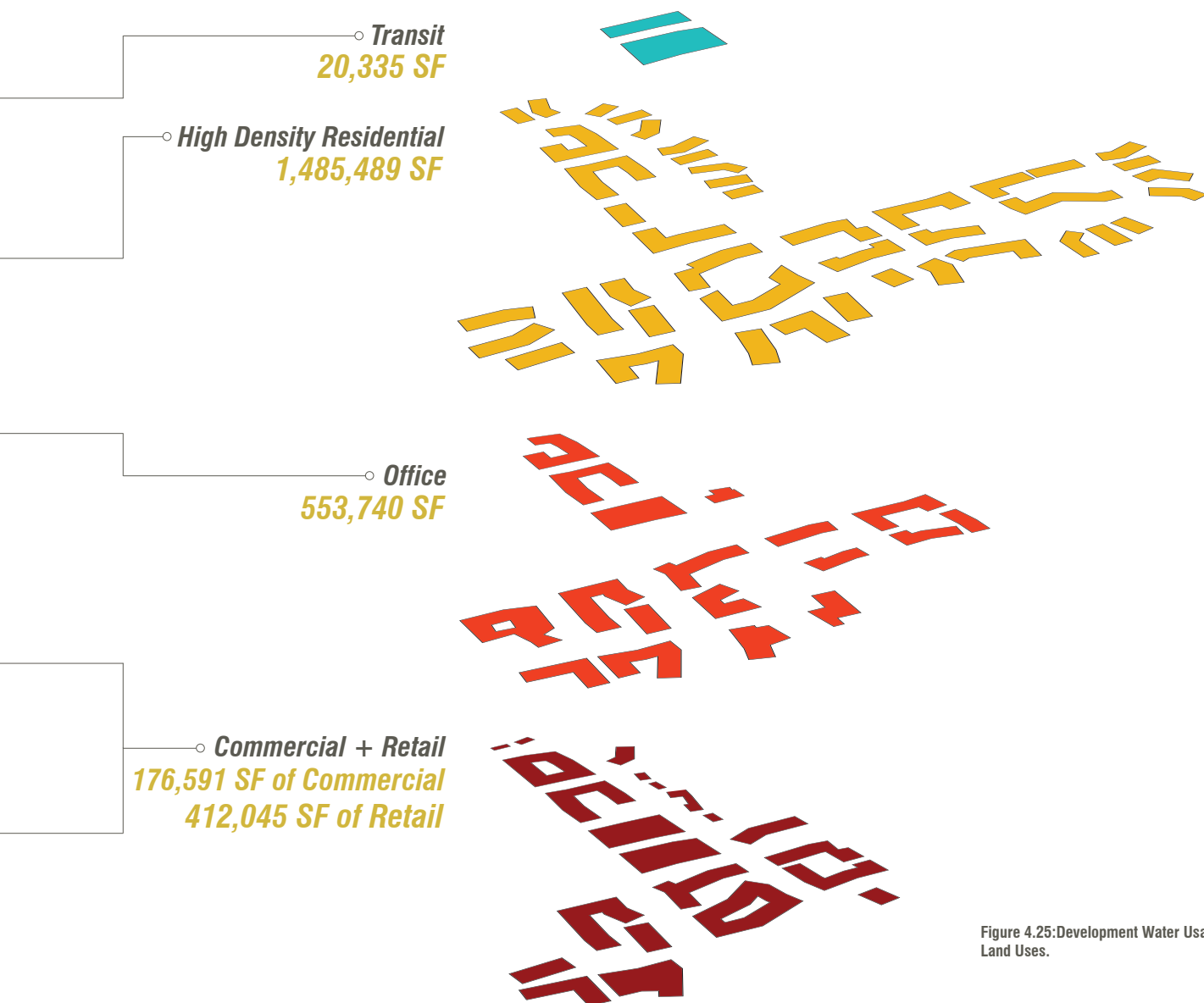
**Figure 4.25:Development Water Usage in Relation to Proposed Land Uses.**

## Living Machine Districts Provide Adequate Wastewater Coverage.

The Living Machine is a system that allows for wastewater treatment in decentralized locations. The Knobtown District has been sub-divided into wastewater treatment districts. Each district contains a Series of Living Machine units that will adequately treat the typical 306,500 gallons of water per day.

According to calculations that have been established through previous precedent studies, Knobtown would need roughly 104,000 square feet of the alloted 106,000 square feet of Living Machine area.

The Old Trail School is made up of one Living Machine unit that can clean up to 5,000 gallons of water per day. The unit is comprised

of roughly 1,700 square feet of plants, and microorganisms that can supply high quality wastewater with an 18 hour turn around.

To calculate the necessary Living Machine® dimensions for Knobtown I divided the total water usage for the development by the 5,000 gallons a day to get the number of units needed to treat the developments wastewater. I then multiplied the total units needed by the dimensions of one Living Machine® unit at the Old Trail School and got the total area needed to treat wastewater within the development.

All excess wastewater that is created will be treated in the Living Machine® units and stored in holding tanks to be used as grey water for toilet flushing and irrigation.
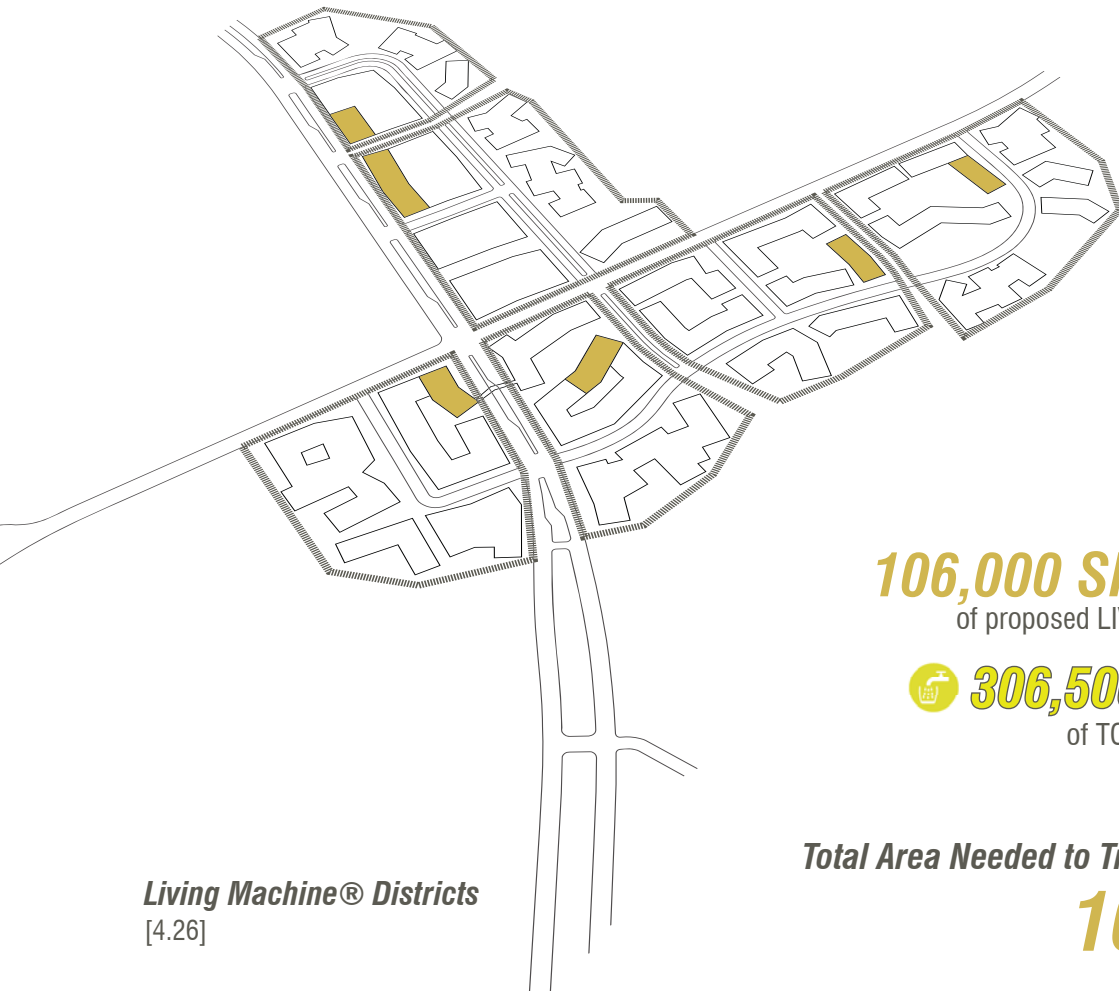
**Legend**

▓▓▓▓▓▓▓▓ Living Machine Districs
▬▬▬▬▬ Living Machine Units
▭▭▭▭ Building footprint

⌐
NTS

**106,000 SF**
of proposed LIVING MACHINE® space

**306,500 gal./ day**
of TOTAL *DEVELOPMENT water usage*

**Total Area Needed to Treat Wastewater:**

**104,000 SF**
of LIVING MACHINE space

***Living Machine® Districts***
[4.26]

**Figure 4.26: Living Machine® Wastewater Distircts.**

## The Living Machine Process in Relation to the Knobtown District.

The Living Machine® sustains its biological community much like a river ecosystem does. Its main sources of energy are sunlight and gravity; solar energy warms the building and fuels plant photosynthesis.

The process begins with a municipal supply providing the source of water to the development. The water is then distributed throughout the development to households and businesses where it is used. On an average day Knobtown will produce nearly 306,000 gallons of water.

The development has been divided into six Living Machine® Districts. The districts each contain a living machine unit that adequately treats the wastewater created. The waste water is collected in several Primary holding tanks where they await treatment, From the tanks, the wastewater is pumped into the Living Machine where it will remain in a cleansing process for rounghly 18 hours. Post-treatment water is again recollected into a reuse storage tank where it awaits to be pumped throughout the development.

The Living Machine® is a cyclical process that allows blackwater to be turned into greywater. The treated water reaches a quality that supports toilet flushing, irrigation, and many other uses.

**\*Municipal Supply**

| Toilets | Sinks | Showers |

**306,500 gal./ day**
of TOTAL *DEVELOPMENT* water usage

Wastewater Districts

*Water is recycled throughout the Knobtown District.*

Primary Holding Tank

**L i v i n g**

**104,000 SF**
of LIVING MACHINE space

**M a c h i n e**

*18 Hour Treatment Cycle*

Reuse Storage Tank

| Toilets |
| Irrigation |
| Cooling Towers |

Pumped Flows
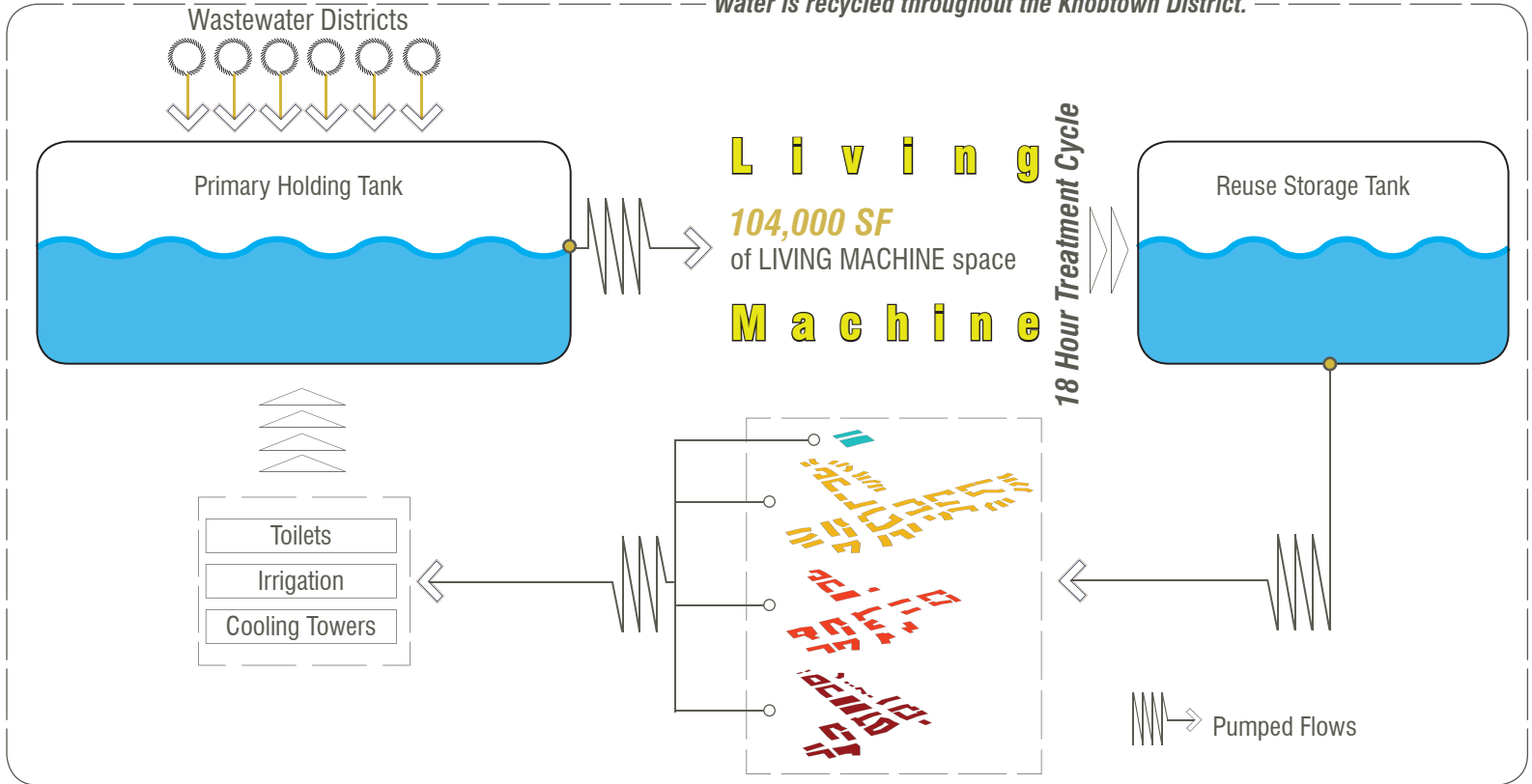
**Figure 4.27: Living Machine Treatment Process.**

*Design.*  _096

**350 Highway**

**Noland Road**

Constructed Wetland

Metro Green Corridor
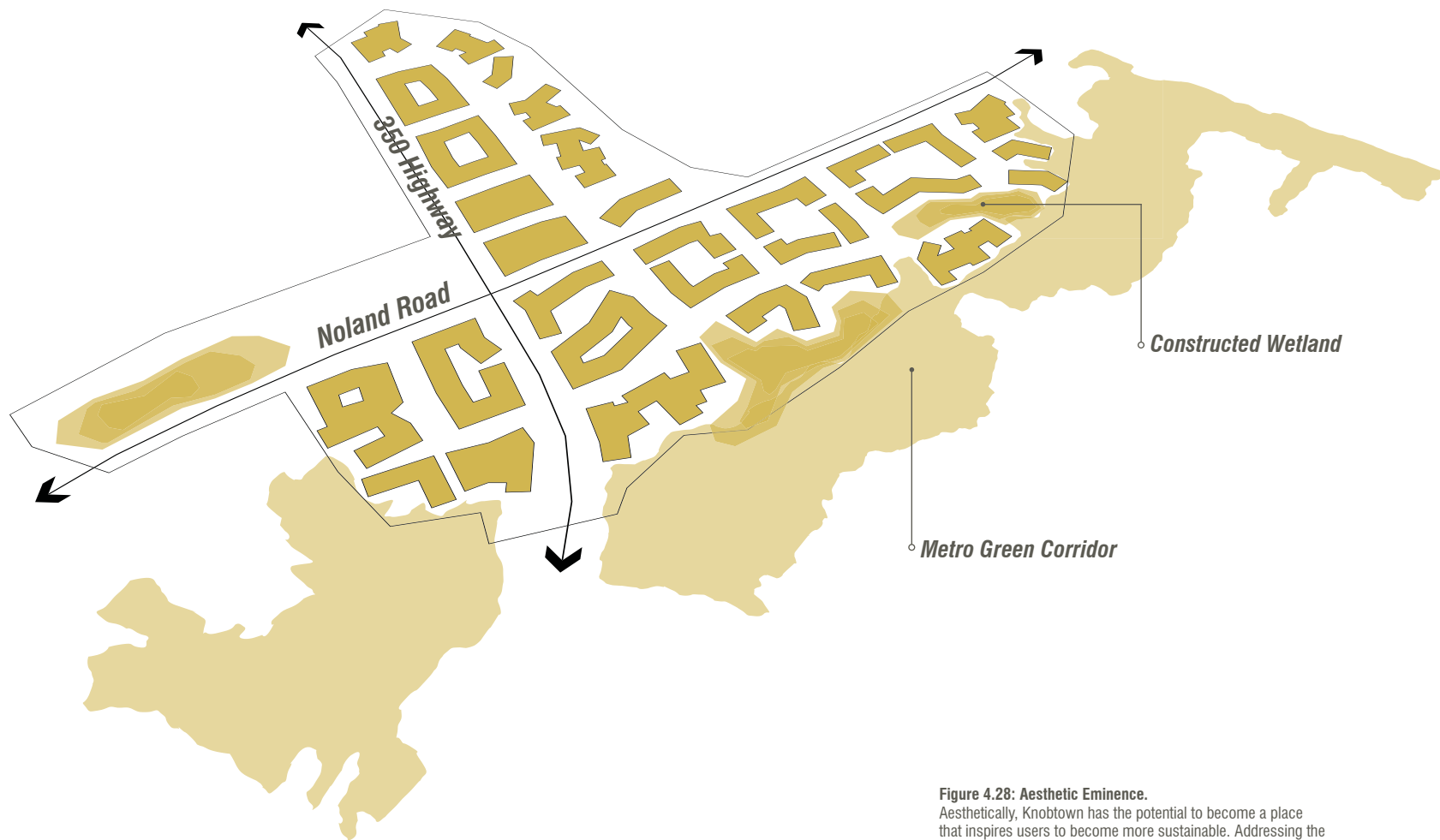
*Aesthetic Eminence.*
[4.28]

**Figure 4.28: Aesthetic Eminence.**
Aesthetically, Knobtown has the potential to become a place
that inspires users to become more sustainable. Addressing the
current site conditions, this solution intensifies the presence of the
Knobtown District.

It is essential that built and natural forms reflect the culture of the
place. Figure 4. is intended to show areas of the development that
can potentially provide an aesthetic richness that currently does
not exist.

350 Highway

Noland Road

Constructed Wetland

Metro Green Corridor

Living Machine Unit

Activity Nodes
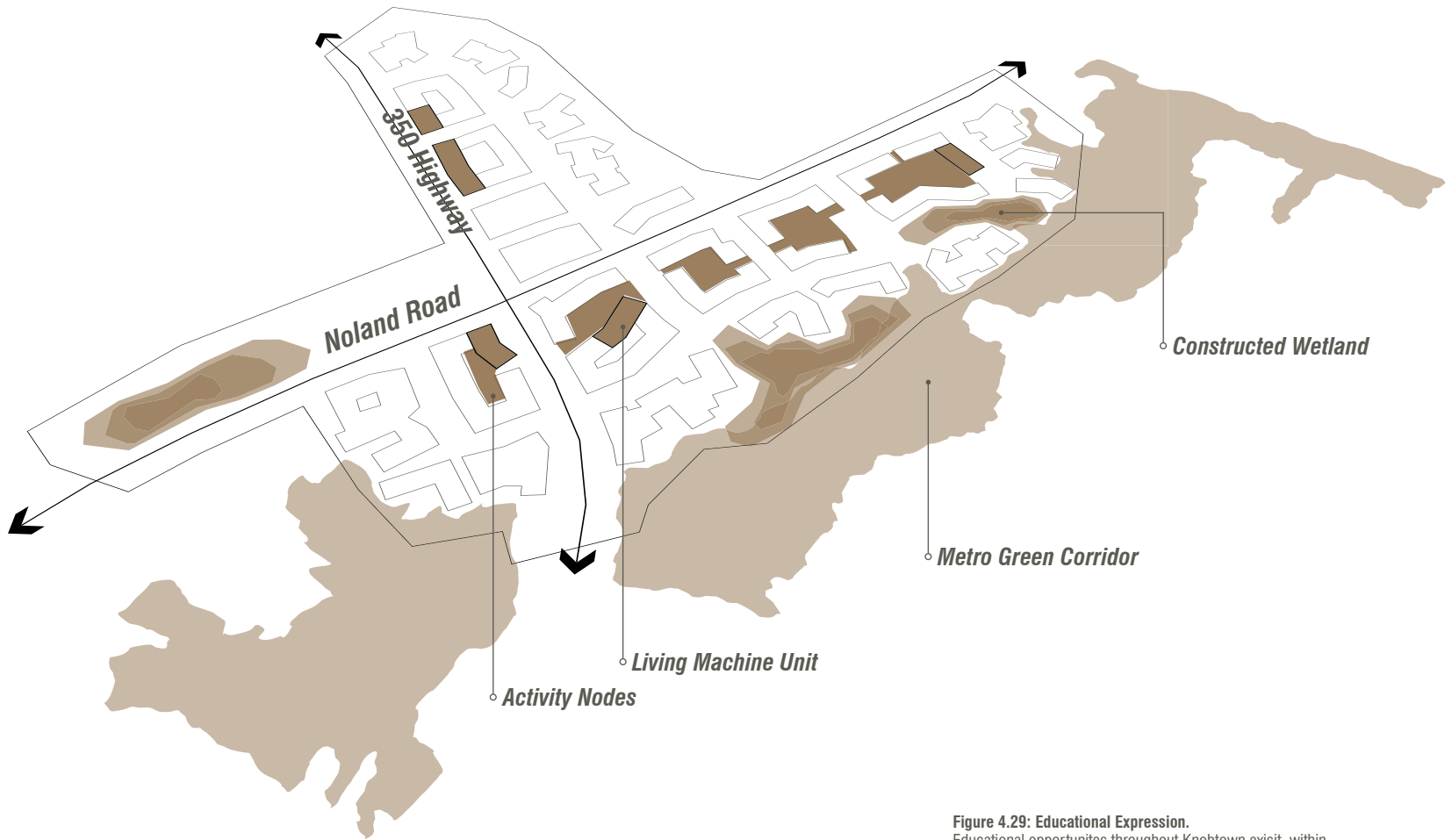
**Educational Exploration.**
[4.29]

**Figure 4.29: Educational Expression.**
Educational opportunites throughout Knobtown exisit  within
three specific areas: structures, plaza spaces and natural areas.
Each of these locations provide a range of exploration potential.
It is important that the program of the spaces allow for self
interpretation of sustainability as well as providing structured
spaces that can hold events, and opportunities for social
interaction.

350 Highway

Noland Road

Constructed Wetland

Metro Green Corridor

Nodes of Activity

Building Facades Along Access Routes
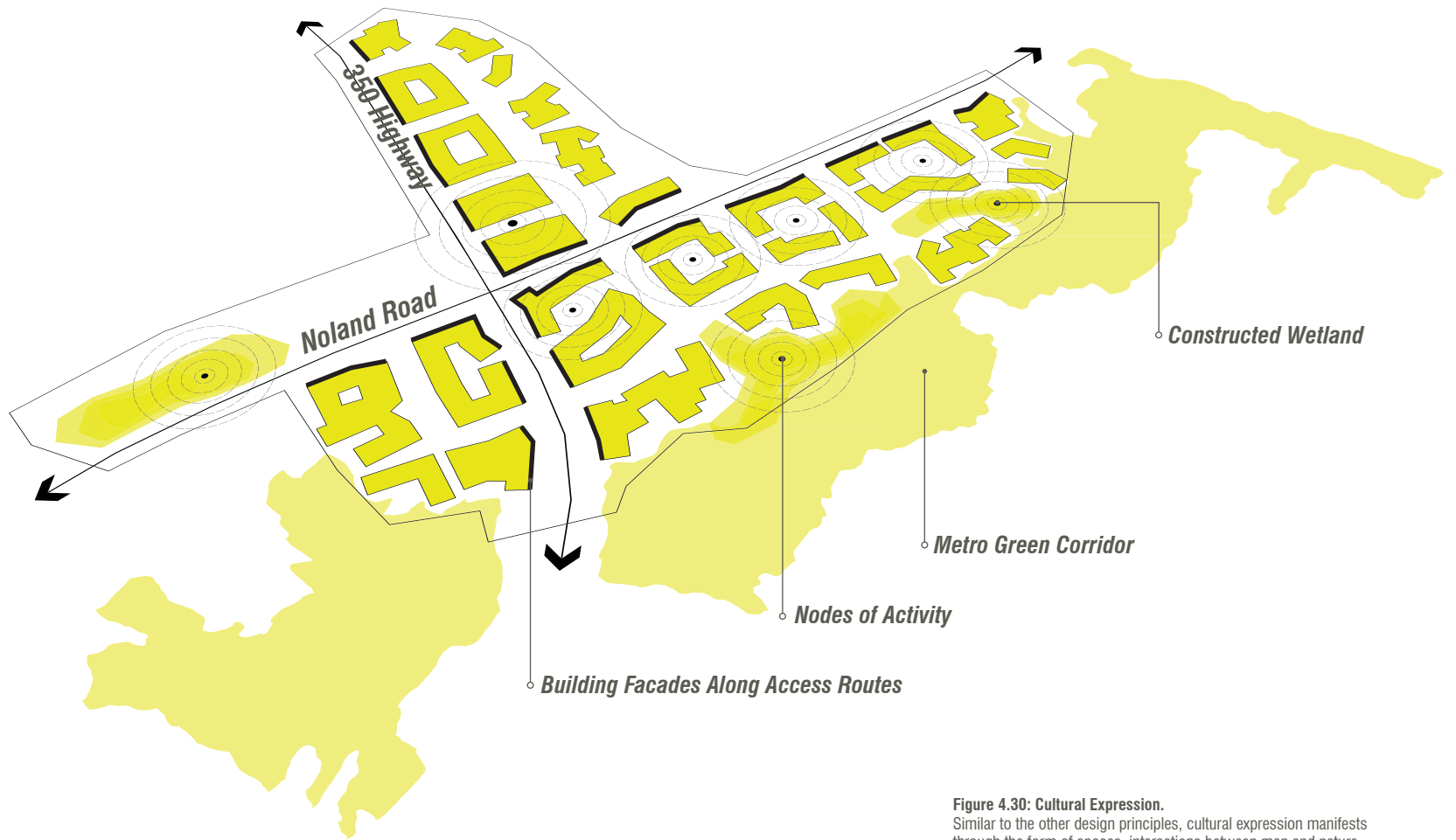
**Figure 4.30: Cultural Expression.**
Similar to the other design principles, cultural expression manifests through the form of spaces, interactions between man and nature and the programs that occur with the nodes of activity. This diagram presents potetial locations that can influence to culture of Knobtown. Nodes of activity identify primary spaces for human interaction promoting culture to build spreading outside of the site boundaried into the Metro Green corridor.

*Cultural Expression.*
[4.30]

350 Highway

Noland Road

Constructed Wetland

Metro Green Corridor

Nodes of Activity
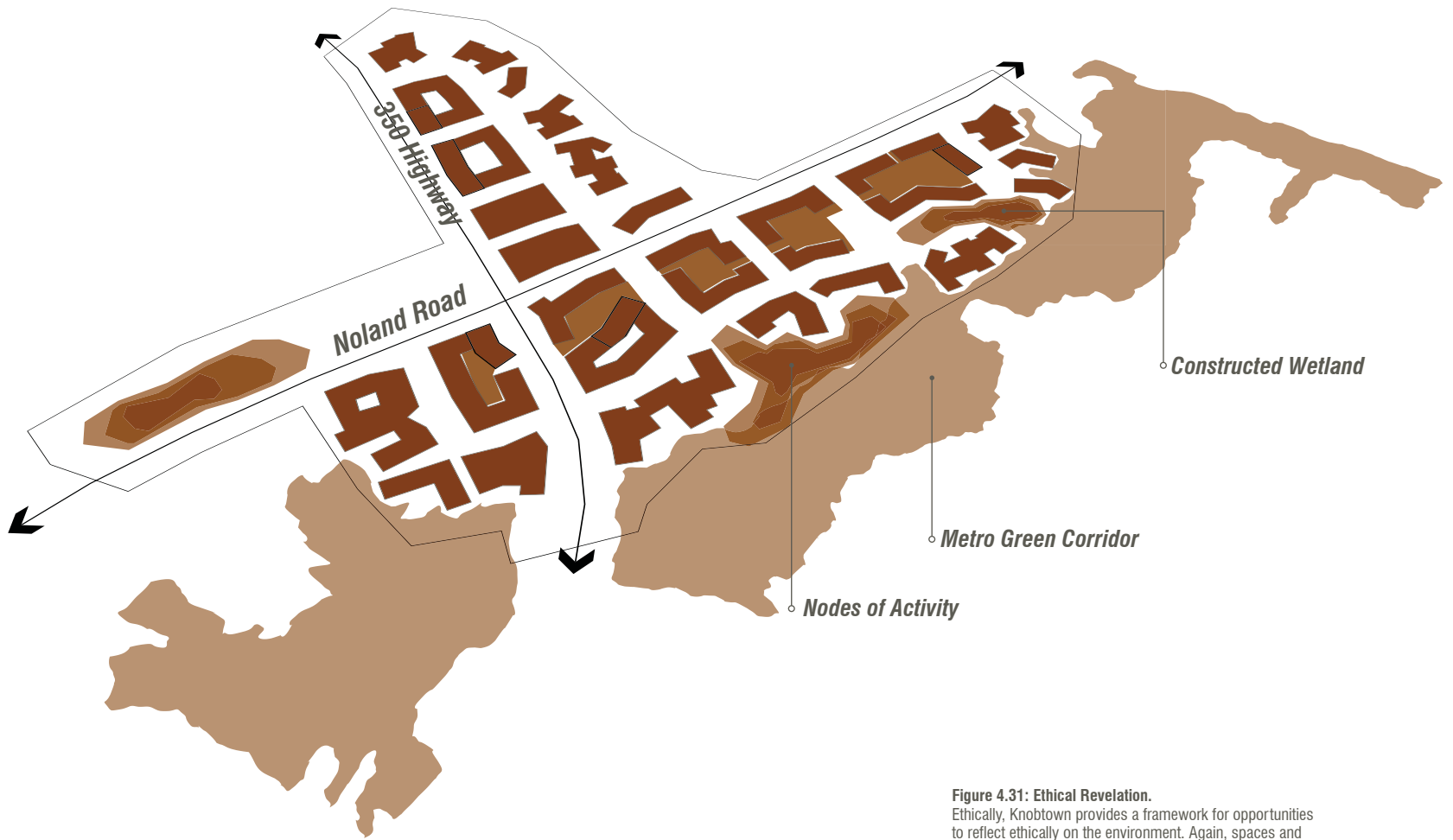
**Figure 4.31: Ethical Revelation.**
Ethically, Knobtown provides a framework for opportunities to reflect ethically on the environment. Again, spaces and environments allow people to establish morals and values addressing sustainability.

*Ethical Revelation.*
[4.31]
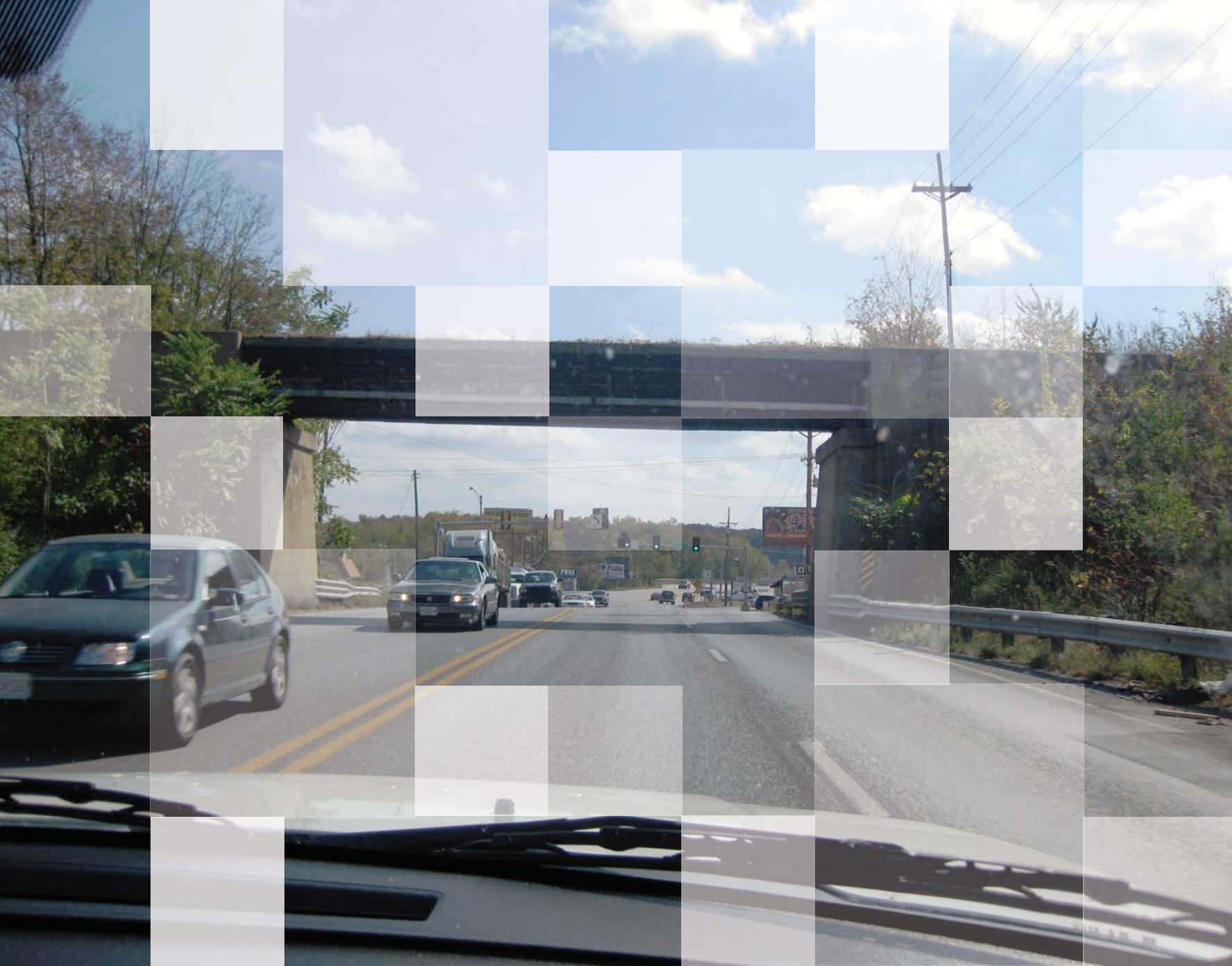
# Conclude + Reflect.

This chapter concludes my Master's Report
with a reflection of design principles,
strategies, and solutions. It will present a brief
summarization of the project, conclusions
of the key design principles and dilemmas,
I have faced throughout the course of the
Knobtown project.

# Introduction.

This master's report concludes the final stage of my educational experience at Kansas State University. In result, I have come to realize the significant amount of knowledge that I have acquired over the past five years.

The Knobtown District has allowed me to introduce an important set of design principles into the Rock Island Corridor. The conceptualization of the Knobtown District has provided me with invaluable experience, that in the future will help me address contemporary issues with a level of depth and expertise. This will allow me to create distinct environments that will help shape the way we learn, grow culturally, and reflect ethically on the environment. This project has allowed me to take a leadership role. As I worked through various stages of the design process I became my own critic, allowing me to understand and reflect on the development of my project. Most importantly, this report has allowed me the opportunity to push my design skills to a level that engages not only my design interests and philosophies, but also those of the Knobtown District creating a project that builds upon the work that has been done by a countless number of individuals.

This final chapter is devoted to the conclusions that I have drawn as the project developed, as well as, how the implications have affected the way I think, process, and design. The chapter will present a summarization of the project, and important findings and conclusions that I have drawn.

# Reflection of Design Principles and Strategies.

*Aesthetic Eminence*

Aesthetic Eminence can be defined as having a sense of the beautiful; characterized by the love of beauty through a position of prominence and superiority *[Meyer 2008]*. As an underlying principle, aesthetic eminence became a main focus for how users interact with education, culture, and how they reflect on the environment. The design proposal used aesthetics as a device enhanced the users experience. Embedded in the DNA of the development, the Knobtown District uses aesthetics to highlight natural processes in locations that made it easy for the user to interact with systems.

Much of the intrinsic value associated with aesthetics resides in its change over time.

These changes are multiple and overlapping, operating at numerous scales and tempos: successional vegetation growth, the rhythms of constructed wetlands, and seasonal changes in temperature and plant growth.

Due to the existing lack of aesthetic appeal, it was essential to engrain the District with an aesthetic that would not only provide identity, but a unique sense of places that made Knobtown a inspiration to users. The building character is such that reflects the sustainable design strategies that facilitate prosperity for the area. Not only did aesthetics address structural elements and infrastructure, but natrual systems and existing corridors. The development is envisioned as an innovative place that incorporates the

responses that aesthetics create leading to a positive outlook on the built and natural worlds.

*Educational Exploration*

"A beautiful landscape works on our psyche, affording the chance to ponder on a world outside ourselves." *[Meyer 2008, 17]*. Through this experience, we are decentered, restored, renewed, and reconnected to the biophysical world. It is essential that the experiences in which we are a part of, begin to shape the way we learn and function as a society.

As part of the four-part framework, educational exploration aims at developing awareness of the environment and its

associated problems, attitudes, motivations, knowledge, commitment and skills to work collectively towards solutions of current issues.

Educational exploration becomes evident primarily in wetland and rain garden areas. Wetland areas allow users to interact and engage in natural systems. Similarly, rain gardens and detention basins allow for users to learn through interpretive signage.

### Cultural Expression

Culture can be defined as the ability to exhibit emotion through a behavior and belief; characteristic of a popular social group. A set of shared attitudes, values, goals, and practices enlightening societal issues [Meyer 2008]. In essence, culture describes the

meaning of a place in which these attitudes, goals, and values are present.

The Knobtown District seeks to establish a culture that is grounded in function and sustainability. As buildings are important in any development, so are the experiences in the transition spaces. Culture manifests in theses spaces by the opportunities they provides. Public spaces have been designed in a fashion that influence a diversity of uses. Whether it be farmer's markets, art shows, or music festivals spaces act as a mediator to build a cultural based around the key design principles.

Nodes of activity act as destinations that give the District and identity. Not only are these nodes infrastructural, but also naturally

occurring. The constructed wetland areas, as discussed previously, have become a major part of the Knobtown District. Each wetland area provides the opportunity to interact and spread environmental ethic through the way we view and learn about the environment. In result, a new culture is built reflecting on sustainability within the development, area, and region. Easy access via commuter rail, vehicle, and bicycle will create a culture that can easily be shared throughout the Rock Island Corridor.

### Ethical Revelation

Emphasizing the hydrologic and wastewater processes of the site, the Knobtown District incorporates several green technologies. Stormwater is directed to constructed wetland areas located at the southern and eastern ends

of the site. Similarly, rooftop runoff is infiltrated in a variety of different ways. For much of the site, greenroofs allow water to infiltrate and is collected in cisterns to be used elsewhere on the site. Where rooftop gardens are not possible, water is directed to rain gardens in private courtyards and public plaza spaces. Green spine corridors extending out from Metro Green act as green streets where water is directed to centrally located swales where water is filtered before entering the Little Blue Trace River.

Besides constructed wetlands, rooftop gardens, and rain gardens, a second component of wastewater treatment became a significant aspect of the districts current water crisis. The area currently does not possess infrastructure to support a Transit-Oriented

Development of this size. The Knobtown District proposal addresses these issues with the implementation of a sustainable wastewater alternative.

The Living Machine offers the community wastewater treatment that reduced the amount of by-product while improving the water quality in the area. This soultion has been distributed throughout the development. These units have taken in the amount of wastewater the associated land uses will produce. Not only are these systems seen as an ecological service, but one that can provide educational benefits with aesthetic appeal. The evidence within the proposal is intended to show stakeholders that conventional wastewater techniques and expensive infrastructure expansions may not be the best solution.

The Living Machine system provides the community with clean water that can be reused day-in and day-out.

Perhaps one of the most important parts to a sustainable future, education allows users to understand that sustainability is a necessity. Public investments such as these will have a forever lasting effect on the minds, of those who experience them.

### The Living Machine®
Perhaps one of the most important issues addressed in Knobtown, wastewater treatment presented the opportunity to create a sustainable wastewater alternative. This alternative, known as the Living Machine® is a complex system of microorganisms and

wetland plants. The ecological wastewater treatment system produces high quality re usable water that allows the district to locally manage wastewater avoiding costly sewer hook-up fees. The energy efficient wetland system provides aesthetic and ecological advantages over other on-site treatment systems while providing the performance, control, and monitoring benefits of state-of-the-art systems. The Living Machine® system offers distinct benefits when compared to conventional systems.

The Living Machines® located throughout the Knobtown development allows for easy and affordable wastewater treatment. The development has been divided into wastewater districts adequately treating blackwater. The Living Machine® within Knobtown is a comprehensive strategy, supporting the rehabilitation and life extension of current critical centralized infrastructure, reducing downstream water treatment loads. In turn, the process offsets potential water load growth creating sustainable, renewable water resource cycles.

The strategies presented throughout this project are intended to create a greater interest in sustainable development. The Knobtown District is ripe for development and presents great opportunities to connect local communities through the Rock Island Rail Line and progressive design strategies.

# Conclusions.

The Knobtown District is conceptualized to provide Mid-America Regional Council and fellow stakeholders the opportunity to explore potential design strategies that can create a sustainable region that balances a thriving economy, social equity, and a healthy environment. As a framework, the Knobtown District can inspire development and design strategies that can bring the area into the future. Although, much of the details are still to be researched it is important to understand that the framework is a foundation for the region that can inspire people to live more sustainably.

The design principles that are presented are utilized as a means of stimulation, helping to bridge theory and practice. The application of these principles have proven to be a dynamic piece of my project that can evolve and grow as development in the region continues. Educational exploration, cultural expression, and ethical revelation emerge throughout the project helping to display sustainability on a level that allows people to understand its significance in the world and also how it can help to alleviate stresses that the built environment is putting on the environment.

In addition, it is important to understand how aesthetics play a vital role in the way natural processes are perceived. In order to provide a positive impact on users and the environment, we need to understand how aesthetic can influence the way we live, think, and feel.

# appendix A: Glossary.

This appendix presents key terms that play an important role in the understanding of the Transit Oriented Development in the Knobtown District. These terms are referenced throught this document and are derived from literature.

# A

**Aesthetic Eminence:** Having a sense of the beautiful; characterized by the love of beauty through a position of prominence or superiority. *[Meyer 2010]*

**"Anti-Consumer Landscape:**
**1.** A landscape that recognizes or speaks to connections of our everyday consumption, to broader land uses and the global environmental crisis.
**2.** To create and altered perception of what is to flourish and to enjoy a "high" standard of living.
**3.** Inspiring new modes of human pleasures and self-realization *[Meyer 2010]*

# B

**Beauty:** A quality or combination of qualities which afford keen pleasure to the senses ow which charm the intellectual or moral faculties, through inherent grace, or fitness to the desired end. *[Meyer 2010]*

# C

**Culture:** The means by which a society has defined criteria for coordinating symbolic practices that affirmed a coherent identity and differentiate its way of life from that of others. *[Papastergiadis 2005]*

**Cultural Clusters:** A geographic concentration of creative sector producers and consumers, stimulating the support of the local artists providing positive spillover effects on immediate communities. *[Stern + Seifert 2010]*

**Cultural Expression:** The ability to exhibit emotion through the behavior and beliefs; characteristic of a particular social group.

# E

**Education:** The act or experience that has a formative effect on the mind; character or physical ability of an individual. *[Meyer 2010]*

**Ethical Revelation:** The act of revealing the system of moral values within a local culture strengthening environmental ethic. *[Meyer 2008]*

# H

**Hybridity:** The strategic integration of societal characteristics and cultures in effort to transform cultural dialects allowing them to coexist in harmony.
**1.** The visible manifestation of differences within identity as a consequence of the incorporation of foreign design.
**2.** The process by which cultural differences are either naturalized or neutralized within the body of the host culture. *[Papastergiadis 2005]*

# L

**Life-Support System:** A complex composition of natural forces and man-made components that are essential for our well-being, happiness, and physical existence within the environment. *[Lewis 2001]*

**Living Machine:** An ecological wastewater treatment system that treats wastewater for re-use -- allowing communities or institutions to locally manage wastewater, create high quality re-use water, avoid sewer hook-up fees while dramatically reducing water and energy consumption and their associated costs. The Living Machine is a "turbo-charged" wetland system which speeds up natural processes for a smaller footprint and a faster return on investment.
*[Worrell 2009]*

# O

**Ontological Security:** A stable mental state derived from a sense of continuity in regard to one's individual experiences. *[Dovey 2001]*

# S

**Sense of Place:** Our appreciation of design elements, styles, and materials that encompass the particular characteristics of a district, a region, or a nation. *[Lewis 2001]*

**Slow Landscapes:** Design solutions that address political and cultural systems in a manner that belies conventional wisdom about the desireability of speed, instant gratification, and maximizing personal profit. *[Meyer 2010]*

**Structure:** Within landscape ecology, the spatial pattern or arrangement of landscape elements. *[Lewis 2001]*

**Sustainability:**
**1.** The ability to meet the needs of present day systems [environmental, economic, social, cultural] while projecting a working framework into the future that preserves viable resources, systems and other necessities that are necessary for our existence *[Benedict 2006]*
**2.** A region or location that balances a thriving economy, social equity, and a healthy environment, meeting today's needs without compromising the needs of future generations. *[MARC 2011]*
**3.** Humans, as individuals and societies, conciously trying to go with the grain of nature. *[Lewis 2001]*
**4.** The degree to which our methods of using a life-support system will provide our descendants with as good of a life as ours, or better; preserving or restoring the environment in which they live so as to be stable in the relationship of all parts of the system. *[Lewis 2001]*
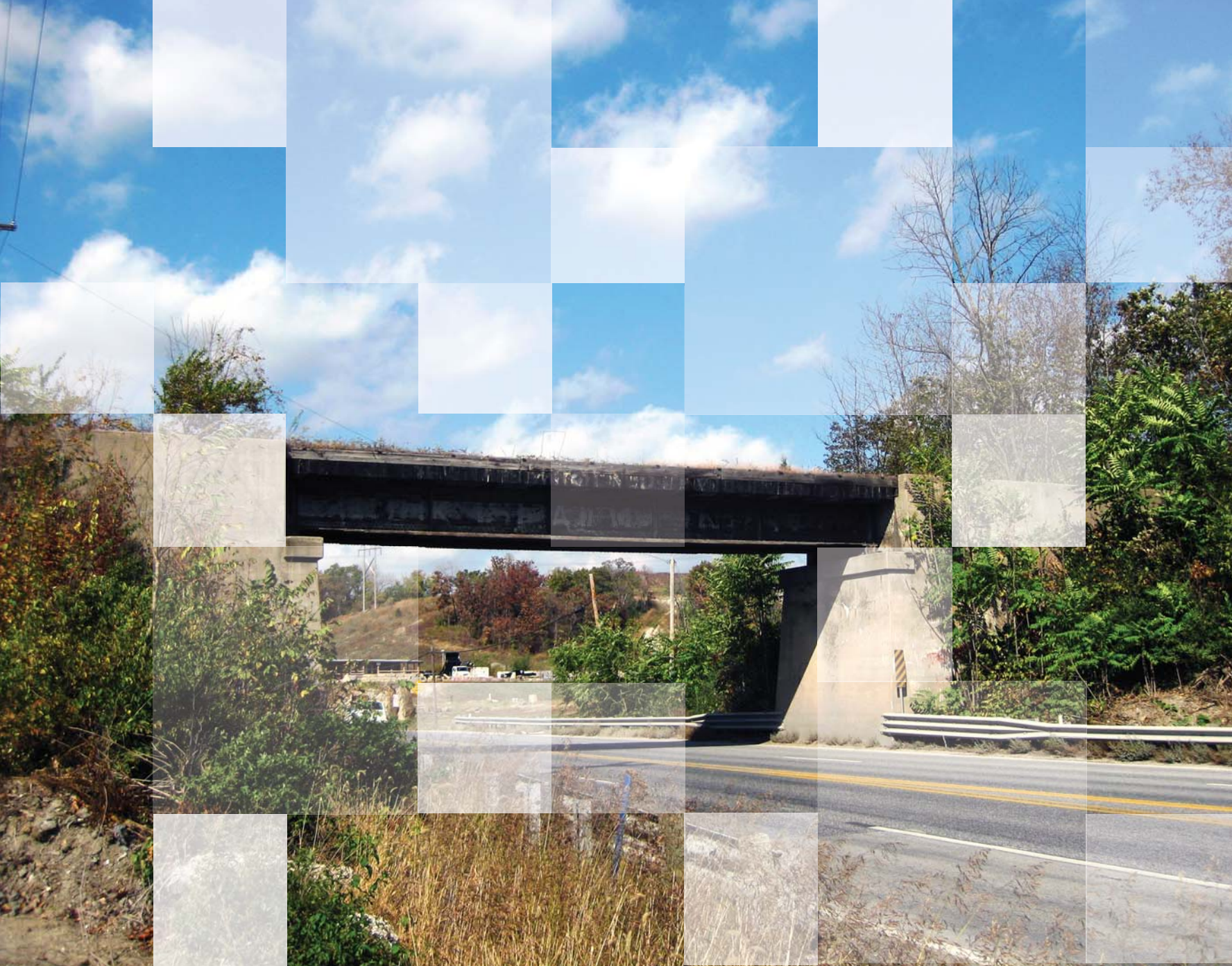
# appendix B: Literature Review.

This appendix presents key pieces of literature that were inflential in the development of the Knobtown District. Each piece of literature in this section summarizes the key points of the text. In addition, the literature is referred to throughout this document.

## Introduction

The process of the literature collection is a critical step in the systematic development of a project. The process of analyzing literature was based on four key principals[aesthetic eminence, educational exploration, cultural expression, ethical revelation] that have thus far shaped the theoretical boundaries of the project development. Each component became influential in the selection and analyzation of  literature. The reviews include the most essential information to the literature and how it serves significance to the development of mixed-use, transit supportive developments.

*"Aesthetics, Well-being, and Health"* in Aesthetics, Well-being and Health: Essays within architecture and environmental ethics.
*Birgit Cold [2001]*

*"The Aesthetics of Place"* in Aesthetics, Well-being and Health: Essays within architecture and environmental ethics.
*Kim Dovey [2001]*

Cultural Clusters: The Implications of Cultural Assets Agglomeration for Neighborhood Revitalization.
*Mark J. Stern + Susan C. Seifert [2010]*

Sustaining Beauty- the Performance of Appearance: A Manifesto in Three Parts.
*Elizabeth K. Meyer [2008]*

Slow Landscapes: A New Erotics of Sustainability.
*Elizabeth K. Meyer 2009]*

Hybridity and Ambivalence: Places and Flows in Contemporary Art and Culture.
*Nikos Papastergiadis [2005]*

Tomorrow by Design: a regional design process for sustainability.
*Philip H. Lewis [1996]*

Sustainable Education: Re-Visioning Learning and Change.
*Stephen Sterling [2001]*

Downtown Development Handbook: Second Edition.
*Susanna McBee [2001]*

Planning for a New Century: a regional. agenda
*Eugenie Birch [2001]*

 Knobtown Land Use and Development Plan.
*City of Kansas City, MO. [2011]*

350 Highway/ Blue Parkway Corridor Plan: A Land Use, Transportation, Aesthetic, and Implementation Strategy for the Redevelopment of the Corridor.
*MARC [2011]*

Stormwater as an Amenity: The application of artful rainwater design.
*Stuart Echol + Eliza Pennypacker [2008]*

# Aesthetics, Well-being, and Health: Essays within architecture and environmental ethics

**Keywords:** Aesthetic Perception, Aesthetic Philosophy

## Summary

Birgit Cold begins by discussing the idea of aesthetic knowledge with varying interest focused under three categories; the perceivable side of the world through the senses, the nature of beauty, and the theoretical and philosophical theories of aesthetic criticism in the arts *[Birgit 2001]*. Our impression's of the surrounding world is aesthetic, through the senses of sound, smell, touch, movement, and vision. Our aesthetic sense allow for our emotional and cognitive processes to become aware, discover, and stimulate our perceptions of the surrounding environment.

Cold also discusses the evolution of aesthetic theory through time, place, and the action in which it has been adapted. Man is stimulated culturally through spirit, intellect, emotion, and senses emphasizing the intensity of influence in cultural ideals, visions, and conditions within a time and place. Within the literature, Cold emphasizes the importance that we understand both our aesthetic relationship to the environment and of the importance of acquiring an aesthetic repertoire enabling us to compare aesthetic phenomenon *[Birgit 2001]*.

"Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. …it is a state or condition that is defined in relation to the constituents of all the environmental and human characteristics that make up the daily lives of people and the reciprocal relations between them."

-World Health Organization

The roots of our health and well-being lie in the sensory experiences that have stimulated our emotions and cognitive process categorized in beauty. It is stated that in modern day society there is a tendency to omit an aesthetic, direct perception, or reflection which requires awareness and engagement. Consequently, our modern behavior and instrumental attitude to time and quality has suppressed our ability to interpret the landscape and our willingness to "look upon the world as if it were new".

## What have I learned?

The paradox that we consider a "real beauty experience" cannot be defined if we are not prepared to learn and search for it; being engaged through our senses. Culturally, our history was shaped through "beautiful works" that survived and became "classical" through the dependence of perception. Throughout time our perception has been mislead through advancements in culture, resulting in the misconception of pure beauty. In order to engage a user, they must first be aware of what beauty truly is, and how it can affect the mind, body, and soul in ways that improve physical and mental health.

# Aesthetics, Well-being, and Health: Essays within architecture and environmental ethics

**Keywords:** Vitality of Education, Adaptability

## Summary

In this essay, Kim Dovey begins to identify the importance of fundamental properties that create a healthy place. Enabling a strong sense of "being at home" allows for one to connect to a place or space through the resemblance to a familiar comfort zone. The experience of home is about ontological security and thus fundamentally important to human health. The aesthetics of home is in many ways the most mysterious because it is the most ideological, the least conscious and the most deeply connected to human well-being.

Typically places that are more public or urban are construed in a way that is interpreted as less "healthy", but in many instances "healthy" places share a unique sense of cohesion and emotional connection between the human and built form. The urban context presents itself as one that provides cohesion between not only the people in the space, but how they can coexist in a setting that generates diversity of social and economic relationships. "Healthy places are "transparent" in the sense that they create educational opportunities for users to learn about the physical settings of their lives, the processes which create them and the ecology of which they are a part." *[Dovey 2001, 96].* A healthy place changes in response to changes within, changes of occupancy, culture, lifestyle, size, and meaning. Thus healthy places connect people to the future as a vehicle for their hopes and dreams to evolve, by providing opportunities for their active and creative participation.

## What have I learned?

In order to create a place that is socially viable it must connect to the senses of the inhabitant. The ambiguity between aesthetics of everyday life and contemplative judgment will remain a struggle until the experience of a place allows the user to learn about the environment they are in. A healthy place is one that is not static, but embodies cyclical and irreversible change promoting sustainability through evolution. The healthy places that have been created were allowed and designed to grow through time. To me it seems that a great deal of the meaning of a place stems from its sheer dynamism.

# Cultural Clusters: The Implications of Cultural Assets Agglomeration for Neighborhood

## Summary

Stern and Seifert review the current focus on the agglomeration of cultural assets to increase tourism and lure suburbanite's downtown. An emphasis is placed on cultural districts as social attractors becoming a strategy for urban economic development. This article examines alternative uses for art in the community, cultivating neighborhoods through cultural clusters, and cultural participants *[Seifert 2010]*.

Cultural clusters that evolve organically from cultural producers and participants differ from cultural districts in that districts are typically more focused on creating venues that bring large crowds, whereas, the cultural cluster perspective requires a greater understanding of how changing character of cultural production and the complex and active interactions between participants of the art community. To me, it seems as if cultural clusters are already existent within the urban fabric and cultural districts are infused into areas declining in industry. These districts re-invigorate the community with attractions that bring much of their revenue from out-of-towners. Cultural clusters have stimulated planning into recreate clusters on a larger scale introducing other types of cultural attractions and arts.

Studies of cities across the country show that diverse communities are the fertile soil in which arts and culture flourish. The studies demonstrate that heterogeneous communities with differences based on social class, ethnicity, and household structure are more likely to have cultural assets.

## What have I learned?

The paradox that we consider a "real beauty experience" cannot be defined if we are not prepared to learn and search for it; being engaged through our senses. Culturally, our history was shaped through "beautiful works" that survived and became "classical" through the dependence of perception. Throughout time our perception has been mislead through advancements in culture, resulting in the misperception of pure beauty. In order to engage a user, they must first be aware of what beauty truly is, and how it can affect the mind, body, and soul in ways that improve physical and mental health.

# Sustaining Beauty. The performance of appearance: A manifesto in three parts

## Summary

Sustainable landscape design is generally understood in relation to three principle- ecological health, social justice, and economic prosperity. Meyer's article begins to examine the role of beauty and aesthetics in the sustainable agenda. She argues that it will take more than ecologically regenerative designs for culture to become sustainable. What is needed are landscapes designed to provoke those who experience them to become more aware of how their actions affect the environment.  This involves considering the role of aesthetic environmental experiences, such as beauty, and how it influences perception of the built and natural environments.

"This is an aesthetic that celebrates motion and change, that encompasses dynamic processes, rather than static objects, and that embraces multiple, rather than singular visions. This is not a timeless aesthetic, but one that recognizes both the flow of passing time and the singularity of the moment in time, that demands both continuity and revolution. This aesthetic engages all the senses, not just sight, but sound, smell, touch and taste, as well." [Spirn 1988, 108].

"Nature is not out there but in here, interwoven in the human urban condition." [Meyer 2008,16].

Meyer's explains the modern day image of sustainability within the profession and makes efforts to introduce aesthetics inducing a better understanding of the environment, culture, and the education interlaced in our experiences with the environment. I find it really interesting how she applies the tactics of a photomontage or collage to the idea of hyper-nature helping to make the unnoticed noticed. Hyper-nature was promoted by pragmatic acknowledgements od the constrictions of building on tough urban sited and the recognition that designed landscapes are usually experienced while distracted, in the course of everyday life. [Meyer 2008,17].

## What have I learned?

By celebrating social, ecological, and cultural systems through artful expression, a more thorough understanding and appreciation of the landscape will result. The cultural value of the landscape provides memorable experiences through form and space challenging, expanding, and altering the human perception of what a truly beautiful landscape may be. "A beautiful landscape is one that works on our psyche, affording the chance to ponder the world outside of ourselves." *[Meyer 2008,17].* The main focus of Meyer's article is the emphasis on nature as a stimulant for sustainability exhibited through hyper-nature. I plan on using her philosophical background as the foundation for my project focusing on education, aesthetics, environmental ethic, and cultural expression.

# Slow Landscapes: A New Erotics of Sustainability

**Keywords:** Slow Landscapes

## Summary

The beginning of the organic movement had a mistaken attitude, because it didn't place any emphasis on pleasure. It was an ideological, almost religious approach. It ignored pleasure. Pleasure is not antithetical to health, pleasure is not the enemy of sustainability. Pleasure is moderation, and with moderation we can be sustainable. An environmentalist or an organic farmer that is not also cultivating pleasure is just out of this world *[Meyer 2008].*

"It has been said that beauty is a guarantee of happiness. Conversely, the possibility of pleasure can be the beginning of beauty" *[Meyer 2011, 23].*

Meyer begins her article by explaining how the standards set for designers [LEED criteria, best design practices] limits sustainable design to one-third of what is should be – the environment. She furthers her argument by exploring the disconnect or ignorance between ecological issues and those of social equity and economic prosperity the other critical components of sustainable design. Slow landscapes can be described as, design solution that addresses political and cultural systems in a manner that belies conventional wisdom about the desirability of speed, instant gratification, and maximizing personal profit. "It is a new form of beauty known through the pleasure experienced through the unhurried enactment of everyday life." *[Meyer 2011, 26].*

Philosopher Alexander Nehamas writes that beauty is…"a call to look attentively at the world…. To find something beautiful is inseparable from the need to understand what makes it so, the features that make it stand out in my world." *[Meyer 2011, 31].*

## What have I learned?

I think the most important point to take out of this reading is that there is a possibility to create an "anti-consumer" landscape that can still bring vitality to an area helping to connect society by means of  new ways of thinking about human pleasure and self-realization in relation to the old way of thinking which seemed to appear as materialistic or economic oriented.

# Hybridity and Ambivalence: Places and Flows in Contemporary Art and Culture

## Summary

The globalization of the movement of ideas, capital, and people has increasingly made the world more interconnected. Cultural dynamics have presented new challenges to existing culture models and patterns resulting in a misunderstanding of the unique expression of activities and ideas occurring in particular places. Papastergiadis, explains that the culture of a region of a place cannot exist [in the contemporary realm] in isolation, demanding that there is a process of hybridization and deterritorialization of cultures and people.

The concept of translation can act as a tool that can provide both a sense of the broader dynamic exchange and explains the specific forms of cultural within a region or corridor.  Not only has environmental literacy become important in modern day society, but also cultural literacy; being bi-lingual or bi-cultural being able to understand and relate to other local cultures. In parallel, conceptual frameworks for hybridity in the viability of culture has become a dilemma that can provide the opportunity for society to learn and grow from each other.

## What have I learned?

As cultures change and evolve so should the techniques in addressing them. By this I mean, with the implementation of new communities and places, local and regional cultures should be present within the design. The concept of translation has become part of the landscape architectural vocabulary allowing society to connect with not only other cultures, but also mother earth. I can see this article becoming inspiration for how I address the diversity of culture along the Rock Island corridor.

# Tomorrow by Design: A Regional Design Process for Sustainability

**Keywords:** Regional Design Process, Sustainability

## Summary

In this chapter, Lewis comments briefly on social and land ethics and then outlines an integrated ethic for sustainability that encompasses our life – support systems, quality of life, intersections between art and life, sense of place, diversity and the available range of choices among all the actions possible in a democracy.

"There is as yet no ethic dealing with man's relation to the land and to the animals and plants which grow upon it… The land relation is still strictly economic, entailing privileges but no obligations."*[Lewis 1996, 19].* A land ethic, then, reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. The "key-log" which must be moved to release the evolutionary process for an ethic is simply this; quit thinking about decent land-use as solely an economic problem. Examine each question in terms of what is ethically and aesthetically right as well as what is economically expedient." *[Philip 1996, 22].*

Lewis identifies the significance of land ethic in today's culture and often refers to Aldo Leopold's ideals on land ethic. He explains that land ethic provides guidance for identifying, protecting and enhancing our life – sustaining resources to assure clean air, clean water, productive soils and preservation of biological diversity and the beauty of the land.

## What have I learned?

Joining social and land ethics is called for because human and natural habitats are part of a continuous system. Resources critical to both must be the determinants of the form of human growth patterns. An integrated ethic can create a foundation for how to approach in words and deed both people and the land that supports our life – support system. Destroying the natural landscape diminishes not only the physical resources but also the physical and aesthetic enjoyment of its many sensory aspects and opportunities it affords for recreation of all kinds. In understanding the natural landscape, come the benefits of sensible land-use decisions as well as personally and socially rewarding benefits of enjoyment.

# Sustaining Education: Re-visioning Learning and Change

**Keywords:**  Educational Principles, Change Strategies, Educational Needs, Roles of Education, Educational Needs

## Summary

Today, most learning is functional or informational, which is oriented towards socialization and vocational goals that take no account of sustainability. Reinforced by Western educational systems, managerial views of education parallel recent economic restructuring. Sterling is critical of contemporary schooling in the industrial world, seeing it as having been re-structured and re-packaged to conform to the philosophy and perceived needs of market and of managerialism. He considers that the approach of 'modernization' and globalization is not as claimed, at the forefront of change, but in many sense actually behind the times. He sees it as:

**1.** Still informed by a fundamentally mechanistic view of the world, and hence of learning

**2.** Largely ignorant of the sustainability issues that will increasingly affect all aspects of people's lives as the century progresses

**3.** Blind to the rise of ecological thinking which seeks to foster a more integrative awareness of people and the environment *[Sterling 2011, 12-13]*.

In the first chapter Sterling poses three central questions to his debate: what is education for; what is education; and whose education? He notes that in the current 'frantic' concern with standards, assessment, quality control and performance, these fundamental questions are pushed aside. Sterling contributes to the debate by suggesting, in relation to the first and second questions, four functions or roles of education. They are:

**1.** Socialization Function- to replicate society and culture and promote citizenship

**2.** Vocational Function- to train people

**3.** Liberal Function- to develop the individual and his/her potential

**4.** Transformative Function- to encourage change towards a fairer society and better world *[Sterling 2001, 25]*.

Sterling suggests that sustainable education is about reconciling all four of these, but also it is sensitively aware that we need to educate for sustainability  and community in the constantly changing world.

 Sustainability is the ability of a system to sustain itself in relation to its environment, given that all systems are made up of sub--systems and parts of larger supra-systems. A system that either undermines the health

of its own sub-systems or of its supra-- system is unsustainable *[Sterling 2001, 54].* Sustainability is about appreciating and respecting what is already there, while conserving and developing creative potential and involving self-realization and resilience. This leads him to discuss the possibilities of education as sustainability.

"Knowing is seen as approximate, relational and provisional, and learning is continual exploration through practice.... There is a keen sense of emergence and ability to work with ambiguity and uncertainty. Space and time are valued, to allow creativity, imagination, and co-operative learning to flourish. In this dynamic state, the process of sustainable development or sustainable living is essentially one of learning, while the context of learning is essentially that of sustainability." *[Sterling 2001, 61].*

## What have I learned?

The great value of Sterling's book is the recognition that sustainability will only happen if changes occur in harmony in both the educational system and the social, economic, and cultural systems. In response to a recognition that the social, economic, and cultural systems are themselves nested in a biophysical system which will eventually destroy them if they don't become sustainable. It is not sufficient for education to transform towards sustainability; both education and society have to transform through mutual interaction. Educators for change need a clearer understanding of an ecological, participatory world view from which a strong ecological educational paradigm requires vision, design, and action from all concerned with achieving healthy, ecologically sensitive societies.

# Downtown Development Handbook: Second Edition

McBee, Susanna et al. 1992. Community Builders Handbook Series. *Downtown Development Handbook: Second Edition.* Washington, D.C.: ULI-the Urban Land Institute. ULI Catalog Number D13.

**Keywords:**   Mixed-Use Development, Principles of Urban Design, Transportation and Parking, Downtown Housing

## Summary

In today's society a diversity of uses is one of the most important characteristics of a vital downtown--so much so that cities encourage a mix of development types through zoning and financial incentives. The primary reason mixed-use development has become so preferred in revitalization is that it allows and provides housing in areas of employment. As the age of suburban sprawl is coming to a close, concerns about transportation and the most efficient use of land and existing infrastructure is beginning to mount.

Susanna McBee has broken this into several sections discussing many of the key components within a mixed-use development. I have decided to focus my research on four of the chapters discussed in her book, "Downtown Development Handbook: Second Edition." (Mixed-Use Development and urban design principles)

The primary focus on the first section, 'Mixed-Use Development' is to summarize only the essentials of of mixed-use development, particularly as they relate to downtown development in the present age. McBee explains that public policy is not the only push for mixed-use. Some believe that for less 'new' development could actually encourage mixed-use developments. Further, she discusses that the implementation of these urbanized environments can allow for a more competitive market than that of a free-standing project.

**Key Features of Mixed-Use Development:**
**1.** Three or more significant revenue-producing uses that are mutually supporting (retail, office, residential, entertainment/cultural/ recreation uses, typically 500,000 sq. ft.)

**2.** Significant physical and functional integration of project components, including uninterrupted pedestrian connections(providing an adequate pedestrian circulation network to and from principle components)

**3.** Development in conformance with a coherent plan (which typically stipulates the type and scale of uses, permitted densities, and related items)

"create a spectacular environment, not spectacular architecture
                    -Stan Eckstut

The goal of urban design is to develop and area whether a downtown or an entire city, as a system of spaces, structures, and inhabitants rather than a series of unrelated buildings, streets, and spaces. The following urban design principles have been identified as key attributes to a successful development:

**Develop according to an organized pattern**
- A clear pattern provides a framework that helps residents and visitors in understanding space

**Accentuate the downtown's distinctive identities**
- Exploit elements that reflect the areas past and explain how the space was developed, distinctive exisiting and natural features. ("authentic places")

**Foster variety**
- Provide a mix of uses-- offices, different types of shops, such as urban storefront shops, urban specialty centers, farmers' markets, and street vendors, cultural attractions like museums and performing arts centers entertainment and restaurants, and housing

**Keep it tight**
- The best downtowns are compact, easily accessible by pedestrians, vehicular traffic, and light rail helping to facilitate access and maximizing convenience.

**Create "People Places" by enhancing street-level activity**
- Provide outwardly- focused experiences that promote human interaction on the street level encouraging pedestrian foot traffic.

**Encourage visual continuity**
- Providing a unified development whose individual merchants success depends on the ease with which potential patrons can locate and identify their businesses.

**Architecture**
- Similarities in building materails and in the massing of building form, spaces between buildings, positive relationships in the location and proportions of facades should be encouraged.

**Streetscapes**
**-** Well-designed streetscapes can function as unifying visual elements that can help vistors in wayfinding.

## What have I learned?

Perhaps some of the most useful information, McBee has provided me with guidelines and principles that can guide the design of a mixed-use development in Knobtown. I plan on applying these principles in a way that can address the exisiting plan and improve upon it. A lot of what McBee was identifying applies to areas of higher density downtowns, however I feel that these principles are very universal no matter the size of the development.

# Planning for a New Century: The Regional Agenda

## Summary

The primary source of Birch's argument comes from the importance of that social and economic roles have on the housing industry in the United States. "...Nearly 4 percent of the nation's Gross Domestic Product is created by residential development, meaning that consumers not only spend money on the homes themselves, but also the furnishings, appliances, etc. have effect on the economy when it comes to the housing market. In this chapter, Birch identifies the present day issues with housing quality and affordability

**The attack on poor housing conditions has taken many forms:**
  -Adoption of housing code enforcement programs
  -Construction of public housing linked with the elimination of slum dwellings
    -Promotion of rehabilitation through incentives and the creation of income supplements

Birch argues that these issues require coordinated approaches that integrate housing with other public and private actions. There is no absolute shortage of housing in the United States, however there is a lack of affordable units for certain households.

Today's median house price: **$146,000**
A household should have a combined income of **$58,000 to $60,000** to purchase a house at the median price.
National median household income: **$37,000**
People meeting the national median household income would only be able to afford a house costing **$92,000**

These low-income households naturally experience the greatest difficulty finding affordable housing. The units that are affordable for the lower-income communities present the issues that older homes and lower quality materials present, the cost of maintenance ensuring a safe place to live.

**Recent programs for making housing more affordable:**
  -The Low Income Housing Tax Credit
  -Targets for the Secondary Mortgage Market
  -Leveraging Community Block Grants
  -Improving Public Housing

-The Community Reinvestment Act
-Targeted Federal Housing Programs

## What have I learned?

The biggest piece of information that i
can take from this reading is more so the
concept of affordable housing in relation
to the current status of the economy. It is
important, especially in the area in which I
am working, that identify the most feasible
way to implement affordable housing, and
how that can have an affect on the growth not
only of the development, but how it will help
surrounding communities grow and thrive.

# Knobtown Land Use and Development Plan

## Summary

The Knobtown Land Use and Development Plan is a very important piece of literature in the guidance and development of my master's report. Building on the recommendations of council men and women, the plan strives to address issues with the existing land use, infrastructure, transportation, and public spaces of the area.

**Goals of the Knobtown Development Plan:**

- Build on the foundation created by the 350 Highway/Blue Parkway Corridor Plan and the Little Blue Valley Area Plan to establish a specific, implementable strategy for the development of the Knobtown district.

- Create a vision for the future development of the Knobtown district and a strategy to achieve that vision.

- Establish consensus among area stakeholders.

- Promote the creation of a thriving, sustainable and desirable community, through strategies that address:

     -Landuse

     -Zoning

     -Infrastructure

     -Area identity and marketability

     -Urban design

     -Transportation

     -Public safety

The document emphasizes the development of the Knobtown District as one that, in the future, will be a u ique community, rich with cultural heritage, natural beauty, and rural character in an urban setting. Through high quality, sustainable growth, Knobtown will

enhance its position as the "Southeastern Gateway" for Kansas City. The area's historical values, environmental resources and vistas, and "small town" charm will be preserved and enhanced and enhanced as new development occurs. Knobtown will be a distinct place that creates a visually pleasing sense of arrival and place to Kansas City that all Kansas Citians will be proud of.

## What have I Learned?

I plan on using this document as a guiding device to my master's report, looking at ways to improve upon the current plans. I also see this as an opportunity to display design skills that can address the Knobtown area and how it can become a successful transit hub for surrounding communities.

# 350 Highway/ Blue Parkway Corridor Plan: A Land Use, Transportation, Aesthetic, and Implementation

**Keywords:** Land Use, Transportation, Implementation

## Summary

The report studied the urban design, aesthetics, zoning, land use, topography, public facilities, parks and open spaces, as well as infrastructure and transportation. Four key elements were identified as determining factors in the existing character, condition, and resultant issues of the corridor:

**1.** The Route- The roadway itself is the major contributing factor the existing character and nature of the corridor.

**2.** Age- The age of the roadway itself, and municipalities in relation to the development of the greater Kansas City Metro.

**3.** Boundaries- The corridor is comprised of 5 separate jurisdictions, contributing to a wide range of guidelines, codes, regulations, and agendas.

**4.** Infrastructure- Much of the corridor has not been developed due to the lack in sanitary sewer, and storm water management practices.

These factors contribute greatly to the existing conditions of the corridor and represent the challenges and opportunities for development.

**Goal: Enhance the long term vitality and attractiveness of 350 Highway/ Blue Parkway corridor as a quality, mixed use environment.**
Objectives:

- Promote an efficient and compatible land use pattern that establishes community focal points throughout the corridor.

- Strengthen aesthetic quality and a sense of identity for the community through development tools that foster: harmonious site planning, architectural and landscape design for development, and encourage aesthetic improvements at existing business locations.

- Maintain a diverse visual character od the natural landscape by encouraging protection of sensitive and unique environmental features and views of special significance, and integrating them as key amenities of future development.

- Provide for a diversity of innovative housing types including creative designs that are responsive to changing population needs and compatible with surrounding neighborhoods.

# Stormwater as amenity: The application of artful rainwater design

**Keywords:** Amenity, Design, Landscape, Stormwater, Techniques, Urban Drainage

## Summary

In this journal article, Echols and Pennypacker discuss specific design techniques that can transform stormwater management into experientially rich artful rainwater design. The concept of "artful rainwater design" is based on the premise that new stormwater management techniques focusing on non-point source pollution, water balance, and small storm hydrology can also be used to create new site amenities. Echols and Pennypacker make the argument that the design of artful rainwater techniques have a greater affect on a users satisfaction and perceived value. In other words, addressing stormwater management in ways that tend to the needs of the environment while also being transformable into amenities that can be used by users.

**Design Techniques to Enhance Aesthetic Richness:**

- Create water collection basins as features/focal points.

- Create visual emphasis on water direction change using scuppers, basins, cisterns, and splash blocks

- Juxtapose river rock and riparian grasses for compositional contrast

- Create a variety of sounds and volumes by allowing stormwater to fall from various heights onto different materials

-Use a variety of water-related plants within visitors' reach, such as rushes and grasses

- Dramatize an implied axis by aligning treatment systems, basins, and runnels connected by the water trail

-Create unified design themes by repeating systems of bioswales, basins, weirs, ponds, rain gardens, etc. Rainwater management is a longstanding concern for landscape architects that will only accelerate in significance as land is developed.

## What have I Learned?

Perhaps the most important thing to take from this article is the ability of rainwater to be used as an educational device, as well as an aesthetic pleasure. With the Metro Green corridor running adjacent to Knobtown, it presents the opportunity to use the creek channel as an amenity to visitors and the environment.
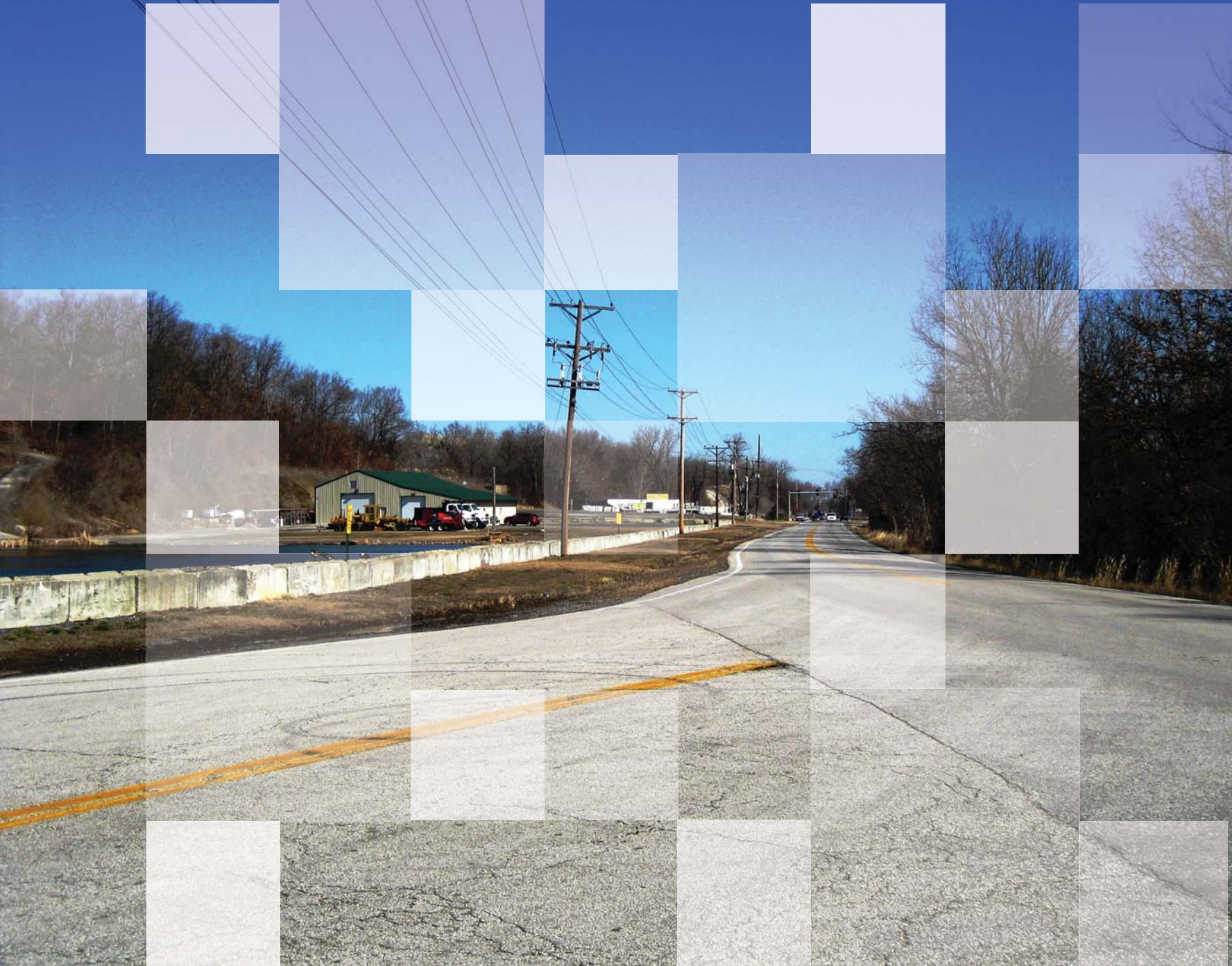
# appendix C: Precedent Study.

This appendix explores the Belmar development in Lakewood, Colorado as a precedent to help inform the development of the Knobtown District. In particular, the precedent study aims at methodological strategies that dempnstrate the relevance in unearthing the complexity and significance of aesthetics, education, culture, and environmental ethic, within sustainability.

## Intent + Critical Dimensions

The purpose of case studies is to allow landscape architects reveal the strengths and weaknesses of a project. These studies can allow a designer to analyze the performance of the built environment helping to inform future design and development of key factors that influence the place in which they are implemented. For the purpose of this case study, the analysis will involve for identifiable steps including:

**1.** Designing the case study
**2.** Conducting the case study
**3.** analyzing the results
**4.** disseminating the results
   *[Francis, 1999]*

From the range of knowledge that can make up a case study, there are several levels of information to be processed and analyzed. For the purpose of this study, I will focus solely on one case study analysis typology; the full case study identifying material with information included of a more contextual and specialized nature. *[Francis, 1999]*

## Case Study Typology

### *Full Case Study*

Project Name
Location
Date Designed and Planned
Construction Completion
Cost / Size
Landscape Architect(s)
Clients / Consultants
Context
Project Background and History
Genesis of Project
Design, Development and Decision Making Process
Maintenance and Management
How does it enhance Aesthetic, Education, Culture and Environmental Ethic?
Program Elements
Site Plans
Photographs

**Site Selection**

■ **Case Study**

□

- Location
- Size
- Cost
- Context
- Project Objectives
- Background + History
- Program Elements
- Project Genesis

[C.1]

**Analysis**

Design Development + Decision Making

political process?
decision making process?
how does the project come together?
**who influences decisions and outcomes?**
*design process?*              implementation process?

Program Elements

how was program developed?    *scale relationships to similar projects?*
*who developed programming strategies?*
**key design concepts?**      how is the project used?
                              *was program modified during course of project?*
inspiration of form?          dimensions?

Project Genesis

                              **did goals change during course of project?**
                    how were goals set?   were other problems solved?
*what are the key goals [social, ecological, aesthetic]?*
**what is the problem the project is addressing?**

Project Significance + Impact

meaning?          how is the community served by the project?
          social impact?   *contribution to sustainability?*
how were constraints addressed?   environmental sensitivity?
*how is the profession served by the project?*

*what does it contribute to my/professional knowledge base?*

Evolution

how is the place percieved and valued?
**how well does the place fare over time?**
*how does the project age incramentally?*

**Vibrant. Connected. Green.**

Sustainable Education

Local Culture

Environmental Ethic

Aesthetic eminence

**Synthesis**

How does the project address **sustainable education**, **local cultures**, **environmental ethic**, and **aesthetic eminence**?
How can this project be influential in future design strategies and techniques?

**Figure C.1: Case Study Methodology.**

*appendix C: Precedent Study.*     _140
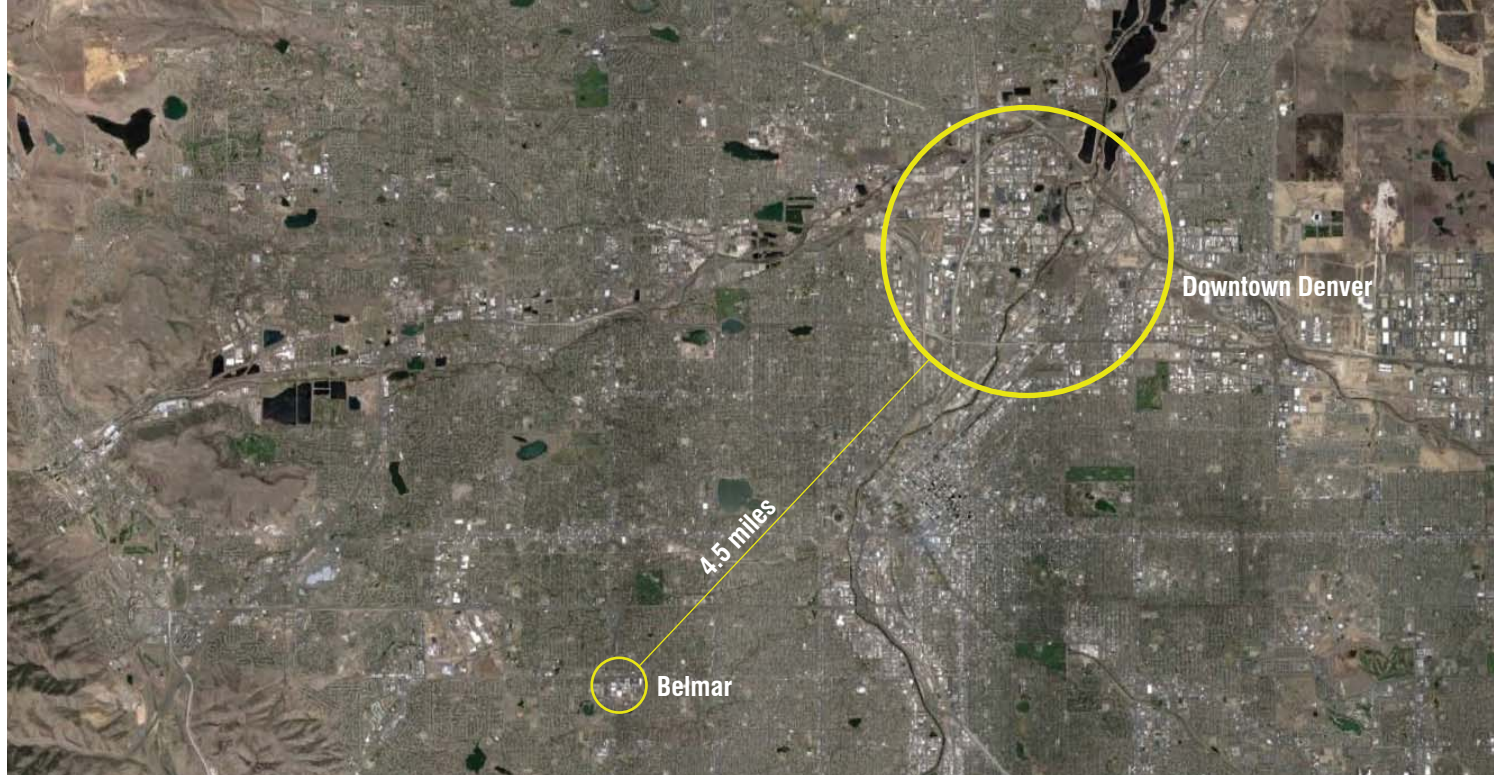
# Belmar.  Lakewood, Colorado

**"Enriching Your Life, Not Your Lawn"**

**Project:** Belmar (3.3 million sq. ft.)

**Location:** Lakewood, Colorado between South Wadsworth Boulevard and South Pierce Street. (Near Denver)

**Date Designed/ Planned:** Design completed early in 2003, groundbreaking taking place that same year

**Construction Completed:**  2001-2012, first phase opened in May 2004

**Percent Complete:** Retail: 60%; Office: 25%; Residential: 15%

**Construction Cost:** Brownfield development = $750+ million

**Size:** 23 city blocks, 104-acres

**Lead Developer:** Continuum Partners LLC

**Planning and Urban Design:** Elkus-Manfredi Architects and Civitas

**Residential Developers:** McStain

Neighborhoods, Trammell Crow, Sunburst Design LLC, and Harvard Communities

**Architects:** Elkus-Manfredi Architects, Van Meter Williams Pollack, and others

**What it Replaced:** Villa Italia (1.2 million sq. ft. enclosed regional mall)

**Key features:** publicly owned streets, LEED-certified buildings, and sustainable site design

Figure C.3: Belmar Site Context Map.

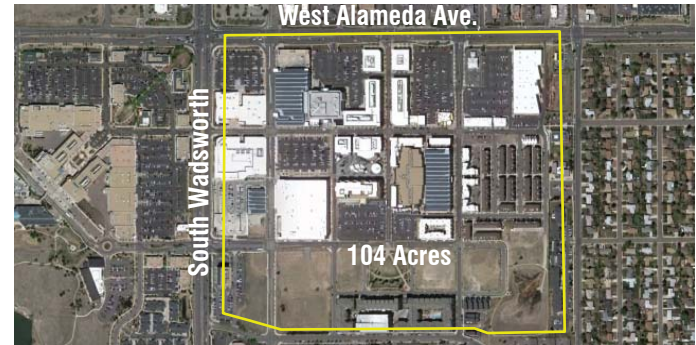# Design Development + Decision Making

Belmar is an example of exceptional sustainable urbanism, having overcome many of the inherent limitations and challenges in retrofitting. The development provides a dense, varied urban environment that acts as a downtown hub for the sprawling suburb of Lakewood, Colorado. *See Figure 1.2 'Site Boundary Map'* Working closely with the city of Lakewood, the developers of Belmar converted the 104-acre site that formerly held an enclosed mall in a sea of parking, into a mixed-use, walkable destinations. Belmar nearly triples the built area, combining shopping, residences, and office and civic uses on twenty-three urban-scaled streets and blocks.

A diverse range of household types and tastes are accommodated in the project's 1,300 housing units in the form of rentals over retail space, townhomes, loft condominiums, and zero-lot-line houses. The architecture is designed with durable materials and simple detailing in mind. Designed by several architects, the mixed-use buildings at the core of the project are mostly built of masonry cladding in a style dubbed "American Mercantile." The strictly residential buildings near the boundaries of the site are wood construction and employ more color emulating the history and climate of Denver.

The privately held development company plans long-term ownership of the project. Working in unison, the city and developers employed strict retrofitting strategies that extend into the local community, bolstering the commitment to infill and urbanize Lakewood, Colorado.

## Retrofitting Decisions and Strategies:

**1.** Scraping and rebuilding of a dead mall greyfield superblock into a mixed-use downtown by dividing the site with public streets that connect with adjacent streets to form discrete urban blocks.

**2.** Blocks developed in phases where the mix of uses on each is subject to adjustment over time, while the street matrix is fixed.

**3.** A continuous  network of streets and open spaces  within which avant-garde arts programming occurs to enliven the atmosphere and enrich the experience of going "downtown"

*appendix C: Precedent Study.*    _142

# Project Programming

### Key Design Concepts

**1.** Create an environment that reflects the local culture on a scale that is pedestrian and car friendly.

**2.** Emphasize the importance of local connections and pride through utilizing existing building patterns helping to maximize development in terms of square footage, store frontage, and human interaction.

**3.** Provide opportunities to educate and inform the public of sustainable design techniques, spreading the awareness of sustainability.

### Design Elements

Design elements throughout the development speak to the local culture of Lakewood and also the greater Denver area.  Thinking about the inhabitants, a variety of housing types were provided supporting several lifestyles within the urban setting. In particular, artists are given the opportunity to become a major part of the community with rentable design studios and art education spaces. For the most part the development is made up of a mix of uses ranging from retail and commercial to higher density residential. As of today, the development consists of nearly 60 percent retail; 25 percent office; and 15 percent residential. In addition to the mix of uses, gathering spaces (the plaza and the green) allow for visitors to interact with a variety of local events ranging from farmers markets on the weekends, to concerts, and art exhibits.

### Circulation and Connections

A major objective of the master plan is to connect the surrounding suburban with the urbanized downtown core. Belmar becomes directly linked through the existing block structure of the surroundings neighborhoods. The development consists of nearly 23 standard sized Lakewood blocks. *Figure C.5.*

# Land Use + Program



Multi-Family Residential

Mixed-Use(Residential, Office, Retail)

Retail

Commercial
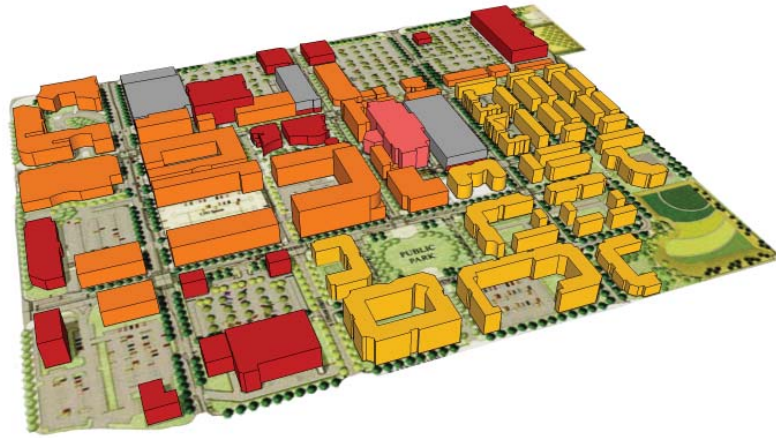
# Connections + Circulation

Line segments identify road networks based on their location, access, and road hierarchy. Belmar not only connects into adjoining streets, but also blends with the existing road structure of surrounding residential neighborhoods.

## Site Evolution



**West Alameda Ave.**

**Wadsworth Blvd.**



Figure C.6: Site Evolution.
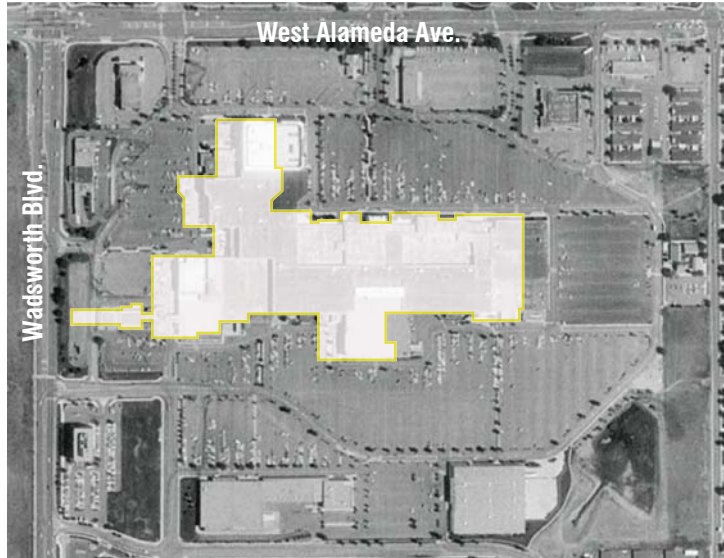
**1975**

1.2 million sq. ft. mall

**2015**

3.3 million sq. ft. of new construction

"Retrofitting does NOT imply the wholesale redevelopment of existing neighborhoods, rather it provides existing neighborhoods with urban nodes on targeted under-performing sites-raising  the question, **how to connect the dots**?"

# Morphological Analysis

Urban morphology can be defined as the physical form of cities *[Dunham-Jones 2009].* The following series of figure-field diagrams illustrates the sites morphological transformations through time. One can see how the pre-urban (160-acre) Public Land Survey grid has influenced the siting of building footprints in relations to major road networks (Building footprints in the 1975 and 1995 figure-field diagrams identify that the locations were influenced by road frontage along Alameda Ave. and Wadsworth Blvd.) The block structure of Belmar identifies the large scale of Public Land Survey blocks and knits the historic morphology with a new human-scale grid creating an easy accessibility for car and walker.

## Suburban Tissues:

1. **Static Tissue** (planned subdivisions)
2. **Campus Tissue** (apartment complexes, shopping mall)
3. **Elastic Tissue** (most transformable land types found along arterial roads)



Figure C.7: Morphological Analysis.

## How has it influenced culture, environmental ethic, education, and aesthetic?

### Culture

The programming of pubic spaces in Belmar are multi-layered, complex, and expansive. Focusing on community connection, Belmar has a yearly Italian Festival that draws crowds of nearly 10,000, weekly farmer's markets, and contemporary art lectures and events. These regular events often attract weeknight audiences of more than 100, many of which travel from Denver.

The two most explicit public spaces are the plaza and the green. The public spaces act as anchors to the development, serving an analogous role to the department store anchors of a conventional mall. The plaza space(a) is located just off the intersection of the two main streets, Alaska and Teller, in the center of the downtown. The green(b) culminates on the axis of Teller Street and serves as a gateway to the downtown.  *See Figure 1.10 'Cultural Context'*

### Environmental Ethic + Sustainable Education

Belmar became one of four developments nationwide to qualify for "Green Bonds" under the American Jobs Creation Act of 2004. The criteria was based strictly on green development techniques and how they affect the environmental impact. Under the program, selected developers who demonstrate energy-efficient construction were allowed to borrow money and not have to pay taxes or interest. This presented huge opportunities to Belmar funding nearly 200 million dollars to the project. With this new grant given, Belmar developers were able to introduce sustainable design techniques such as, 1.8-megawatt rooftop photovoltaic systems, parking lot wind farms, and evaporative cooling systems.

Belmar has also become a demonstration site for the Colorado Public Utilities' legislated mandate to increase renewable energy use statewide. Many of the buildings in Belmar have achieved a LEED Silver Certification in building construction. Also, passive solar site

Figure C.9: Downtown Mixed Use.


Figure C.10: Multi-Family Units.


Figure C.11: Art Studio Spaces.

design strategies are included in the project, like using highly reflective paving materials and harvesting and planting several large ponderosa pine trees in the plaza spaces.

A third route of sustainable urbanism was achieved through the reduction in car trips and vehicle miles traveled per day. The mixed use and nearly tripled density at Belmar addresses the goal providing easy access and a walkable community. In accordance with the design, eight regional bus routes thread the streets of Belmar allowing for easy access from inside and outside the surrounding communities.

## *Aesthetics*

Different aesthetic qualities occur throughout Belmar, whether it be nature or architectural. Building type and land use can be identified not only by their location but, also how they are represented. With the use of these distinct aesthetic qualities, it helps to identify the user with the culture that has been set in place. The architecture is nothing out of the ordinary, hinting at the use of sustainable materials and design techniques. The style is that of an area that is very oriented in the art world, whether it be sculptures or building fronts. *Figure C.9*

# Programmatic Elements

Although Belmar is not 100 percent complete it still has been valuable to see how the site had evolved from a 1.2 million sq. ft. conventional mall into a 3.3 million sq. ft. mixed use development. The developers really focused on creating a place that the residence of Lakewood could be proud of. They created a sense of pride that radiates throughout the community. Belmar has a strong potential to age well in that it is constantly changing and evolving. Construction is projected to end in 2012, however it is seen as a dynamic place that will present visitors with new attractions experiences on a seasonal basis. By this, Belmar plans to provide activities that can grow and adapt through events that specifically address the local culture. Site design accommodates human use in every season. For example, the main plaza space acts as an outdoor social space for dining, and water recreation in the summer and an exterior ice skating rink in the winter months.

Lakewood City Manager Mike Rock expressed the communities excitement towards the community stating, "Ten minutes from downtown, but why bother?" The people of Lakewood have truly fallen in love with Belmar. The government and staff of Lakewood approached design and public interaction in a completely different way. The represented government felt that the days where over when citizen groups were asked, "what do you want? What should we do?", officials felt that it was their responsibility for appropriate participation. Rather, they chose to take an iterative process talking about the components that make a place interesting and livable.

The impact on the community has proven to be significant, helping to bring people together in a place that addresses sustainability through artistic form and expression. Perhaps one of the biggest successes of the project is the amount of diversity across the development, addressing numerous housing types while also providing gathering spaces linked by retail shops and art galleries.

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