

WESTFIELD CORRIDORS MASTER PLAN

FINAL SUBMITTAL: FEBRUARY 6, 2007



TABLE OF CONTENTS

SECTION 1: INTRODUCTION

Project Purpose and Intent	1-1
Goals and Objectives	1-2
Project Structure	1-3
Corridor Input Process	1-4
Using the Recommendations	1-5
Conclusion	1-5

SECTION 2: CORRIDOR ENHANCEMENTS

Introduction	2-1
Corridor Design Process	2-1
Conceptual Corridor Enhancements	2-6
Creating a Town Identity	2-8
Conceptual Corridor Enhancements	2-10
Conclusion	2-30

SECTION 3: ACCESS MANAGEMENT

Introduction	3-1
Purpose	3-1
Roadway Functional Classification	3-1
Access Management Objectives	3-2
Elements of the Access Management Plan	3-3
Implementing the Access Management Plan	3-6

SECTION 4: CORRIDOR APPLICATION

Introduction	4-1
Project Location	4-1
Corridor Design Process	4-1
Existing Corridor Character	4-2
Existing Corridor Conditions	4-2
Corridor Land Use Recommendations	4-7
Specific Areas of Interest	4-11
Corridor Design Recommendations	4-12
Conceptual Cost Estimate	4-28

SECTION 5: DOCUMENT APPENDICES

Appendix 'A'- Steering Committee Survey	5-1
Appendix 'B'- Steering Committee Programming Exercise	5-11
Appendix 'C'- Recommended Plant List	5-19



ACKNOWLEDGEMENTS

MPO Staff:

Kevin Mayfield, MPO Project Manager

Steering Committee Members:

Kevin Buchheit, Director of Development, Town of Westfield

Ann Cavaluzzi, Planner I, Town of Westfield

Renne Goff, Public Works, Town of Westfield

Jack Hart, Director of Transportation, Westfield Schools

Tom Higgins, Senior Planner, BZA, Town of Westfield

Joe Plankis, Chairman, Westfield Steering Committee for the Comprehensive Plan

Jerry Rosenberger, Town of Westfield

Jennifer Miller, Planner, Town of Westfield

HNTB Design Team

Ron Taylor, ASLA, Project Manager

Tom West, AICP

John Myers, PE, AICP

Matt Miller, PE

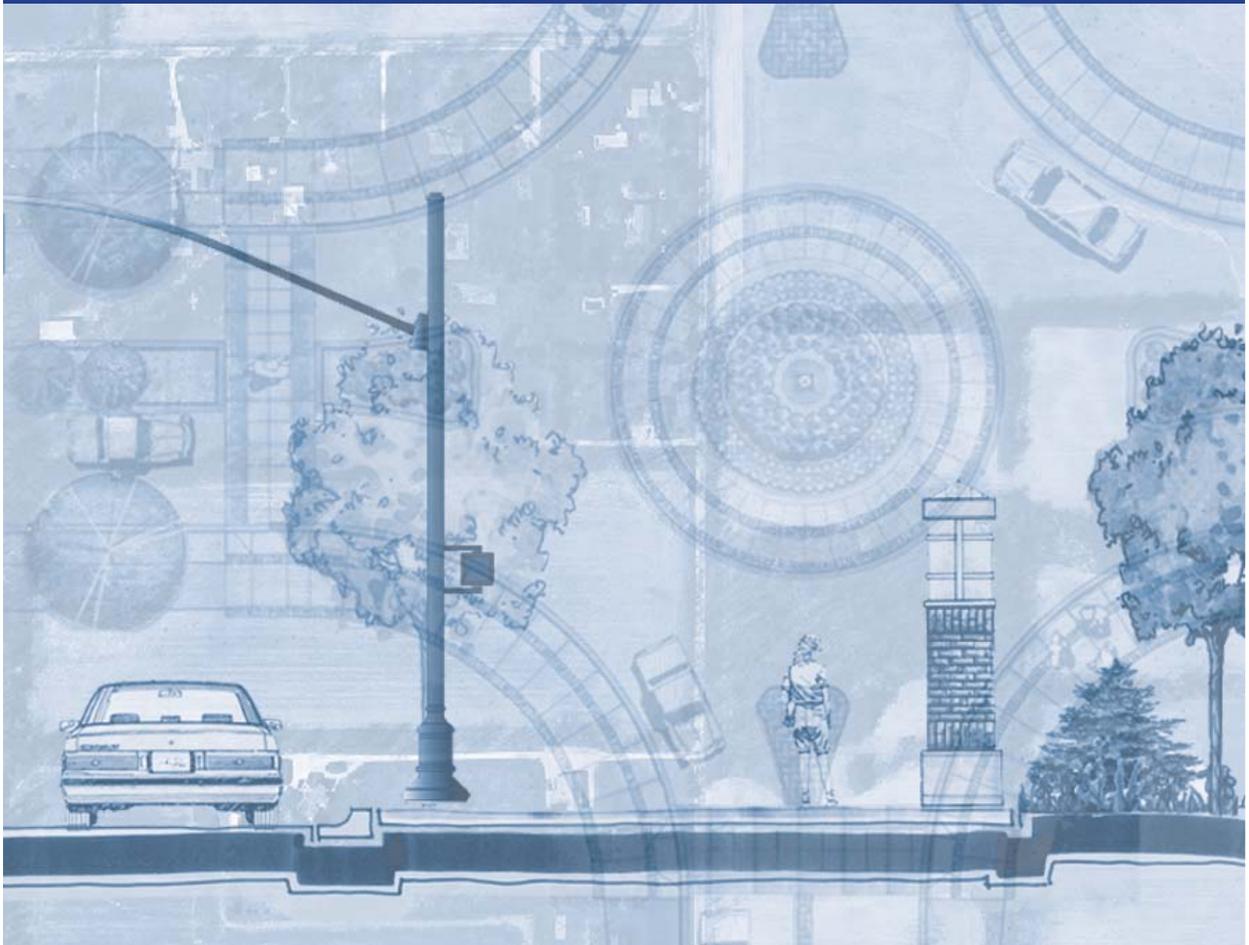
Amy Williams

Katie Clark, ASLA

Dan Syrus

1

INTRODUCTION



1 INTRODUCTION



INTRODUCTION

The Town of Westfield's Corridor Master Plan provides the level of information needed by planners, engineers, agencies, elected officials and the public to make informed decisions regarding the best overall development of all main north-south and east-west corridors in Westfield. The establishment of a corridors master plan is a means for the community to help manage growth and the development of community streets while creating a unique overall character for the roadway system within the Town. While these corridors will ultimately provide critical transit, they will also support and encourage positive development practices. This corridor plan defines critical elements and guidelines that will help the community meet its transportation infrastructure needs and establish a unique character for the Town of Westfield.

PROJECT PURPOSE AND INTENT

As the community continues to grow there are several roadway corridors in and outside Westfield that will soon require improvements for traffic flow and congestion. These upgrades ultimately will change the traffic patterns in Westfield. Of specific interest is US 31, which is the main north-south corridor from Westfield to downtown Indianapolis and to communities north of Westfield. Once the Indiana Department of Transportation begins construction to rebuild US 31 as a limited access highway through Westfield, there will be significant impacts to Westfield's circulation patterns and its main transportation thoroughfares. Proactive steps are being taken to create a new set of corridor guidelines and enhancements that can be used to create a design vocabulary for roadway development in the Town of Westfield- a new corridor standard which can be applied to future roadway corridors as well as existing corridors.

This project is structured to accomplish two primary objectives. The first objective is to establish guidelines for how to best use the space within the right-of-way to enhance the appearance and function of Westfield's major roadway corridors. The second objective is to apply these guidelines to two prototypical corridors: Oak Ridge Road and Carey/Grassy Branch Roads.

Activities to develop and apply these guidelines to the prototype corridors were performed at the same time. In fact, an integrated process was used, whereby the guidelines were developed, applied to the prototype corridors, refined to fit corridor needs, then redefined as guidelines. One of the benefits of this approach is that in addition to the community-wide guidelines presented in this report, Westfield will benefit from the demonstrated application of these guidelines to two real-world corridors.

GOALS AND OBJECTIVES

As a response to the purpose and need for the project, specific project goals and objectives were established to guide the project. The goals and objectives for the Westfield Corridors Master Plan were developed based on information gathered from goal setting exercises with the steering committee, stakeholder interviews, and input from the public.

The goals for the Westfield Corridors Master Plan focus on four elements:

- ◆ Access Management
- ◆ Roadway Engineering Guidelines
- ◆ Transportation Enhancements
- ◆ Non-Vehicular Transportation

These goals are broad statements meant to introduce key concepts and ideas important to the development of roadway corridors in the Town of Westfield. These goals express important values and desired outcomes for the community. Each goal includes a list of objectives with specific, measurable outcomes, which can be used to indicate success in measuring the desired goal. The overall project goals and objectives for the Corridors Master Plan are as follows:

TRANSPORTATION ENHANCEMENTS

Goal #1: In order to make each corridor a signature community piece, design roadway enhancements that establish a unique character for Westfield while promoting the access management guidelines developed for the corridors.

Transportation enhancements are significant in creating a high level of visual integrity along the corridors. Without these enhancements, a roadway can lack a sense of place and character. Roadway enhancement such as ornamental lighting, banners, gateway treatments, wayfinding signage, pedestrian amenities, and special paving treatments can unify a corridor and strengthen the overall plan. They can also create a visual character for users of the roadways unique to Westfield.

The transportation enhancement objectives are as follows:

- ◆ Create or establish aesthetic treatments that improve and define the street edge and access points;
- ◆ Identify key gateway areas and opportunities where design elements can support the desired image for the community;
- ◆ Create aesthetic treatments that establish a unique identify for the community;
- ◆ Develop standards for the appropriate pedestrian access within the corridor.

BICYCLE AND PEDESTRIAN FACILITIES

Goal #2: Create circulation through the corridors that promotes and encourages safe and efficient pedestrian, bicycle, and non-motorized transportation.

Bicycle, pedestrian, and other non-vehicular transportation options are critical to the overall transportation network along and beyond the corridors. Many regional trail networks exist within Westfield and play an important role in maintaining a pedestrian-friendly network. The community has placed an emphasis on the development of pedestrian trails, and has created development guidelines that mandate the incorporation of trails along the perimeter of all new development. It is vital that new corridor guidelines facilitate the connections of these trails, and provide crucial connectivity within the regional transportation network.

The objectives for creating bicycle and pedestrian facilities are as follows:

- ◆ Provide multi-modal access and appropriate facilities in all roadway design guidelines and design standards;
- ◆ Promote connectivity within the corridors;
- ◆ Utilize each corridor as an opportunity to expand the community's pedestrian network and trail system.

ACCESS MANAGEMENT

Goal #3: Develop access management techniques and strategies that optimize the function of each roadway corridor and promote safe and efficient access to destinations within Westfield.

Access management is the systematic control of the location, spacing, design, and operation of the driveways, median openings, interchanges and street connections to a roadway. It also involves roadway design applications such as median treatments and auxiliary lanes, and the appropriate spacing of traffic signals (Access Management Manual, Transportation Research Board, 2003).

Access management utilizes these means to optimize the function of a roadway. The access management techniques established in the master plan are intended to preserve the integrity of the roadway function. In addition, the implementation of these access management strategies will reinforce the roadways as consistent master planned corridors, while maintaining a high level of safety.

The objectives for access management are as follows:

- ◆ Establish the appropriate level of movement and access;
- ◆ Develop standards for the number and appropriate location for access points along each roadway;
- ◆ Identify additional strategies that optimize the movement of vehicles and people through the corridor.

ENGINEERING GUIDELINES

Goal #4: Establish appropriate roadway design guidelines for the corridors that meet the community's development goals while providing efficient and safe movement throughout all corridors.

The engineering portion of the master plan is meant to establish ideal traffic criteria for the development and expansion of the community's roadways. The guidelines established will focus on the efficient movement of people through the corridor and set the construction standard for all roadways in the community. These design guidelines will result in well designed transportation systems that improve the safety and function of the corridors. In addition, the corridor master plan will establish aesthetic guidelines that reinforce the critical engineering solutions being proposed.

The engineering objectives are as follows:

- ◆ Establish roadway design parameters that meet the community's traffic needs for each corridor;
- ◆ Establish guidelines that encourage multi-modal use of all corridors, such as pedestrian corridors;
- ◆ Develop guidelines that can be applied to other developing Westfield corridors.

PROJECT STRUCTURE

The planning process for the Westfield Corridors Master Plan was a collaborative approach that utilized four distinct sets of professionals to form a collaborative corridor design. Land use planners, transportation planners, roadway engineers and landscape architects looked at the project from different vantage points, and were able to create a set of corridor enhancements that are in harmony with the existing and future land uses, and the needs for a safe and efficient transportation system.

Although not all of these components are discussed specifically within this report, they were integrated and coordinated throughout the development of the study to provide a comprehensive corridor master plan. As shown in Figure 1-1, individual roles and responsibilities and the multi-disciplinary project approach were discussed at the first steering committee meeting.

This multi-disciplinary team began a four step design process with guidance from the Town of Westfield and appointed Steering Committee members. The design process included the following parts:

- ◆ Existing conditions analysis
- ◆ Program Development
- ◆ Developing goals and objectives
- ◆ Conceptual corridor master plan design

CORRIDOR INPUT PROCESS

In order to aid the design team in the planning process, an interdisciplinary group of town employees and interested residents formed a project steering committee. This steering committee was charged with overseeing the corridor master plan process and provided meaningful feedback and input at various stages of the process. Beginning in June, the project team and the steering committee met and began discussing the project study area, preliminary project goals and objectives and other relevant information. Over the course of eight months, the project team and steering committee met six times to discuss various parts of the project. Each meeting was focused on a specific topic and updates were given on a variety of project objectives.

The steering committee included:

- ◆ Kevin Bucheit- Director of Development
- ◆ Renee Goff- Westfield Public Works
- ◆ Ann Cavaluzzi- City Planning
- ◆ Tom Higgins- Senior Planner, BZA
- ◆ Jennifer Miller- City Planning
- ◆ Jack Hart- Director of Transportation, Westfield-Washington Schools, Plan Commission
- ◆ Joe Plankis- Chair, Westfield Steering Committee for Comprehensive Plan
- ◆ Jerry Rosenberger, Town of Westfield

ADDITIONAL PUBLIC INPUT

Public Participation- The project also included a public input process. Two public presentations were included as part of the project. At the first public meeting, held on November 16, 2006, preliminary concepts were presented and the public was able to view the conceptual drawings and recommendations for each type of enhancement. Feedback was collected from those attending and incorporated into the final recommendations for the master plan. A second public meeting will be held to present the final recommendations of the plan.

Additional Public Information Coordination- Additional coordination updates and presentations have been included for key agencies and governing bodies. An update presentation was prepared for presentation to the Plan Commission at its November 27, 2006 meeting. In addition, an update presentation was given to the Town Council at its December 11, 2006 meeting. Figure 1-2 documents the public participation process from the November 27, 2006 public meeting.

Another form of community input used for the project was individual stakeholder interviews. Several individual stakeholders along the two prototypical corridors were



Figure 1-1: Images from the first Steering Committee meeting discuss roles and responsibilities for the project.

interviewed for the project. These stakeholders included public officials and agencies, local developers, and facilitators of local facilities. The interviews helped to add additional perspectives to the development of the conceptual treatments and to identify potential concerns on a more specific basis.

USING THE RECOMMENDATIONS

In addition to the steering committee and public input, valuable information was taken from the Westfield Thoroughfare Plan which was being completed concurrently with the corridor master plan study. By using the information found in the thoroughfare plan, the design team was able to create a hierarchy of roadways and priorities which helped aid the design programming phase of the project. In addition, the thoroughfare plan also helped to provide the framework needed to begin to define the spatial requirements needed in order to implement the overall theme and vision of the corridors. By utilizing right of way information from the thoroughfare plan, an ideal cross section was developed which can be applied to all roadway classifications.

CONCLUSION

The following report details access management and corridor enhancement recommendations that can be applied to all roadway corridors within the Town of Westfield. It outlines a new vision for the treatment of roadways in the community. It establishes a set of aesthetic guidelines that give Westfield a new and unique character. Specific recommendations include:

- ◆ Utilize natural and sustainable landscape treatments consistent with more traditional parkway designs. Focus the most extensive landscape treatments at intersections and other areas where increased attention is desired.
- ◆ Emphasize pedestrian environments and pedestrian-scaled details in the design of all corridors. Provide multi-modal access and appropriate space for pedestrian facilities with the designated parkway cross-section. Utilize roadway rights-of-way as opportunities to expand the community's pedestrian network and trail system.
- ◆ Use design enhancements to create a unique character for Westfield's roadways. Create community-specific identifiers and infrastructure to visually unify all of Westfield's major roadways.

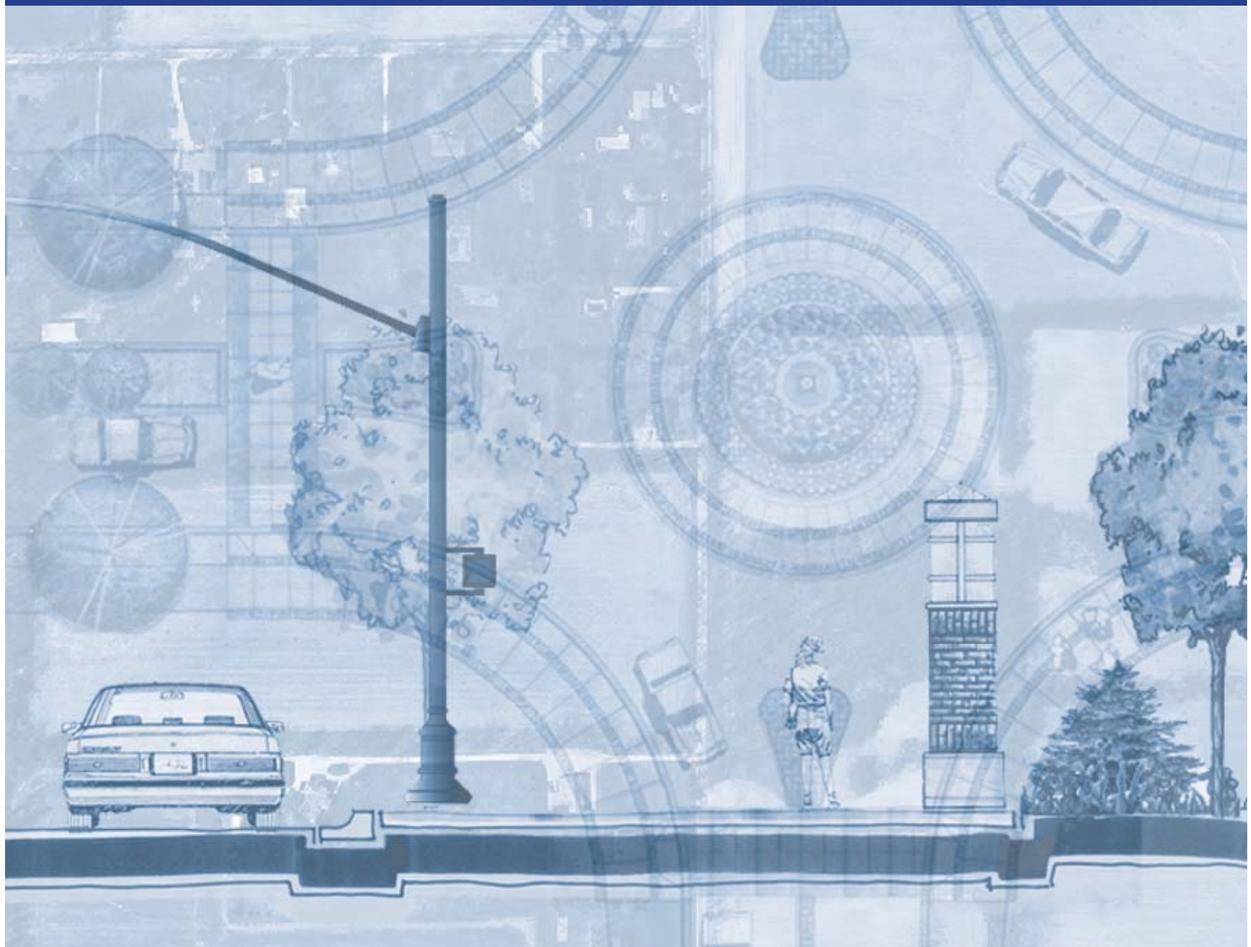
It is recommended that Westfield apply these recommended guidelines in combination with effective access management techniques so that the intended function of the roadways is maintained. A suggested policy for the application of access management techniques within major corridors is presented in the Westfield Thoroughfare Plan document developed during the same time period as this project.



Figure 1-2: The public meeting gave residents of Westfield the chance to give their input on the corridor vision and enhancement concepts.

2

CORRIDOR ENHANCEMENTS



2

CORRIDOR ENHANCEMENTS



INTRODUCTION

The Westfield Corridor's Master Plan is not unlike many other similar corridor studies. The underlying focus is to provide safe and efficient routes for ever growing traffic volumes in the community. Where this plan differs is in the fact that it is providing incredible forethought in the development of the roadway and the surrounding visual aesthetic. By completing this master plan, the community leaders of Westfield realize that the success of a roadway goes beyond traffic counts and travel lanes. The Westfield Corridor Master Plan provides the unique opportunity to establish a design aesthetic and guidelines that will enhance the land use development guidelines set forth in the comprehensive plan, and will influence the corridor's design aesthetic before it is built. This ability to shape the corridor before it happens provides an exciting avenue for establishing a series of goals and having the ability to implement them with fewer constraints.

The design process consisted of a four step process that was completed with guidance from the Town of Westfield, appointed steering committee members and additional input from the public. The design process included the following parts:

- ◆ Existing conditions analysis
- ◆ Program development
- ◆ Developing goals and objectives
- ◆ Conceptual corridor master plan design

CORRIDOR DESIGN PROCESS

Existing Condition Analysis

The entire corridor system within the Town of Westfield was looked at to better understand the hierarchy of roadways, existing land uses and potential areas where corridor right of ways could be restricted. This analysis helped identify opportunities and constraints that could effect future development and conditions that could impede the flow of traffic.

This analysis also offered the design team the chance to look at the corridor system in regards to areas of future development and how those proposed developments will impact the traffic volumes and efficiency along the corridors. The findings allowed the design team to create specific design recommendations for two north-south corridors: Oak Ridge Road and Carey/Grassy Branch Road.

While the design team focused on overall corridor system existing conditions, illustrated in Figure 2-1, specific inventory and analysis exercises will need to be done when designing specific corridors. Examples of specific corridor inventory and analysis can be found in the prototypical applications of these corridor enhancements. This information is included in Section 4 of this report.

Goals and Objectives

Although a series of goals were developed to address the land use and access management needs of the community, the transportation enhancements goal and objectives expressed several important values and desired outcomes for the community. The following broad statement aided the design team in developing transportation enhancements that not only created an unified design vocabulary for the town, but also reinforced the existing and future access management and land use guidelines for the community.

TRANSPORTATION ENHANCEMENTS

Goal #1: In order to make each corridor a signature community piece, design roadway enhancements that established a unique character for Westfield while promoting the access management guidelines developed for the corridors.

Transportation enhancements are significant in creating a high level of visual integrity along the corridors. Without these enhancements, a roadway can lack a sense of place and character. Roadway enhancement such as ornamental lighting, banners, gateway treatments, wayfinding signage, pedestrian amenities, and special paving treatments can unify a corridor and strengthen the overall plan. They can also create a visual character for users of the roadways unique to Westfield.

The transportation enhancement objectives are as follows:

- ◆ Create or establish aesthetic treatments that improve and define the street edge and access points;
- ◆ Identify key gateway areas and opportunities where design elements can support the desired image of the community;
- ◆ Create aesthetic treatments that establish a unique identify for the community;
- ◆ Develop standards for the appropriate pedestrian access within the corridor.

Program Development

Once the existing conditions analysis was completed, a program development phase of the project was initiated to gauge the community's desire for the character of the corridors as well as the anticipated level of investment for

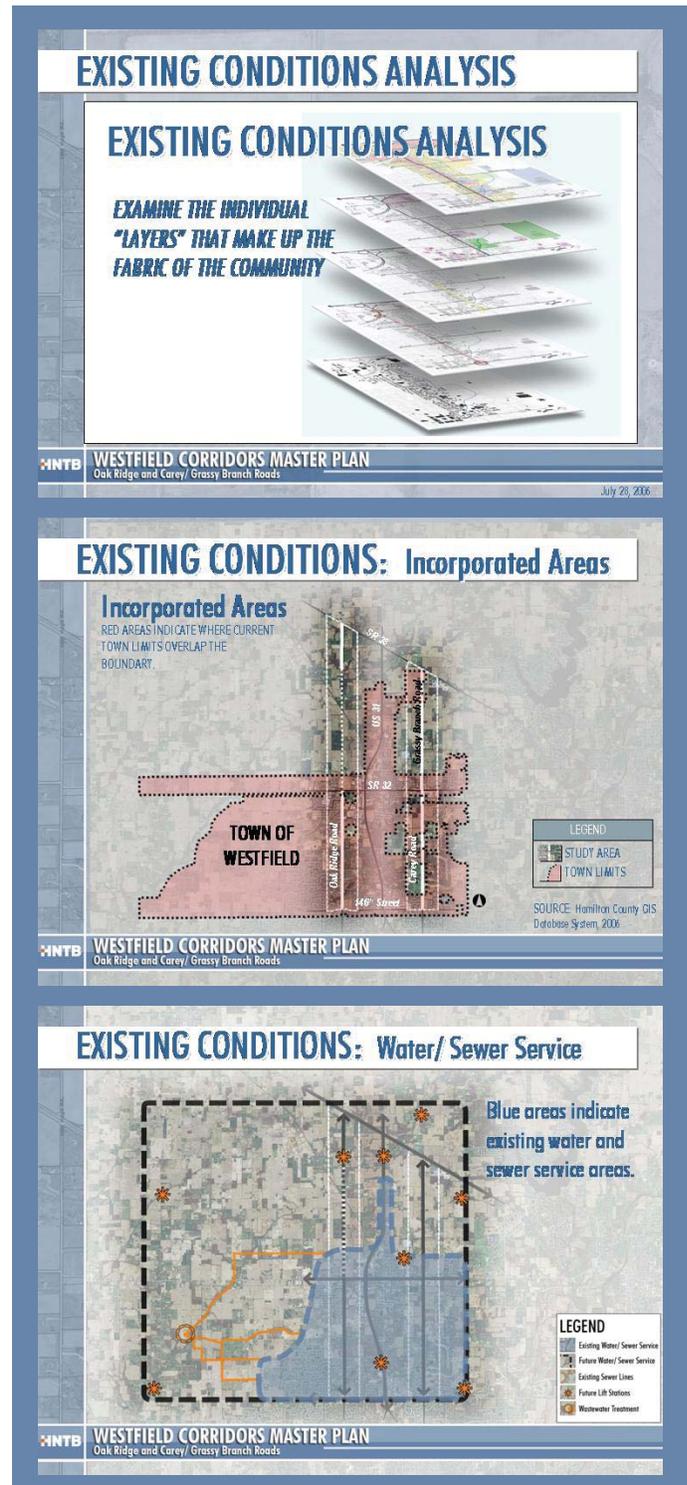


Figure 2-1: Examples of the existing conditions analysis used to determine general areas of opportunity and constraint.

specific corridor enhancements. Several exercises were conducted to collect input from the steering committee and key members of the public. The process used the steering committee to focus the design efforts and provide “informed direction” for the project.

Steering Committee Survey

A survey was conducted with steering committee members. The survey, which can be found in Appendix ‘A’, utilized a series of questions to better understand broader community issues and perceptions. The survey also asked for feedback on general corridor characteristics that were appealing to the steering committee. Representative comments gained from the survey included:

- ◆ The Town of Westfield has no real sense of identity;
- ◆ The corridor design should have a high emphasis on pedestrian issues and connectivity;
- ◆ The corridor design should be more natural in form;
- ◆ Although the community has some historic parts; it is viewed as more contemporary.

Stakeholder Interviews

Another form of community input used for the project was individual stakeholder interviews. Several individual stakeholders along the two prototypical corridors were interviewed for the project. These stakeholders included public officials and agencies, local developers, and directors of local facilities. The interviews helped to add additional perspectives to the development of the conceptual treatments and to identify potential concerns on a more specific basis.

Appropriateness and Priority Exercise

Following the survey, steering committee members were asked to take part in an enhancement priority exercise that focused on priorities and appropriateness of enhancements in general terms. This exercise, illustrated in Figure 2-2, was meant to determine which typical corridor enhancements were appropriate for Westfield. Steering committee members were presented with typical images of several corridor enhancements and first asked to vote on which enhancements were appropriate for Westfield’s corridors system. The results were as follows:

Most Appropriate for Corridor

- ◆ Gateways
- ◆ Lighting and Ornamental Poles
- ◆ Signage
- ◆ Bicycle Facilities

Appropriate

- ◆ Banners and Ornamentation
- ◆ Wayfinding Signage
- ◆ Pedestrian Amenities
- ◆ Structural Enhancements
- ◆ Special Paving



Figure 2-2: The input from the steering committee survey and enhancement priority exercise was used to define programming elements.

Following the appropriateness exercise, steering committee members were presented with the same images of typical corridor enhancements and asked to vote on which enhancements were priorities for the corridors. The results are as follows:

Top Priorities

- ◆ Lighting and Ornamental Poles
- ◆ Bicycle and Pedestrian Facilities

Secondary Priorities

- ◆ Gateways
- ◆ Signage
- ◆ Pedestrian Amenities

Low Priorities

- ◆ Banners and Ornamentation
- ◆ Wayfinding Signage
- ◆ Special Paving Patterns or Materials

Not a Priority

- ◆ Structural Enhancements
- ◆ Public Art

Enhancement Programming Session

Once the survey and voting results were tabulated and presented to the steering committee, they were then asked to take part in a more focused programming session. This programming session, illustrated in Figure 2-3, was used to determine the design direction and level of investment desired for each enhancement that was identified as a priority for the community. Using the results from the previous steering committee input sessions, a preliminary list of corridor enhancements was presented for the corridors along with a series of images depicting varying degrees of treatment.

For each enhancement, three to four images were presented illustrating a range of treatment from minimal to aggressive. Steering committee members were asked to select the image that best represented the level of treatment desired for roadway corridors in Westfield. This information further enabled the design team to determine the level of investment desired for each type of enhancement.

The programming session, which can be found in Appendix B of this report, provided a list of program elements that were used to develop the conceptual corridor master plan recommendations. Descriptions and illustrations of the conceptual corridor recommendations that resulted from this programming session are included on the pages to follow. The results of the programming session identified the following level of treatments that served to direct the development of design concepts for the corridor:



Figure 2-3: The visual preference survey helped determine the level of investment for the corridor systems.

Pedestrian Crossings- Because of the desire to increase pedestrian activity along Westfield's corridors, pedestrian crossings were viewed as a high priority for the town and were chosen to be a moderate treatment along the corridors. In areas of high vehicular traffic, pedestrian crossings can be widened and constructed with colored pavers. In areas of minimal vehicular traffic, or minor pedestrian crossings, striped thermoplastic white lines will be utilized.

Sidewalk Treatments- Overall sidewalk treatments should be kept to a minimal to moderate level of treatment. The simple material palette of a concrete or asphalt multi-use path will allow for minimal maintenance on all pedestrian paths along the corridors. In an ideal situation, sidewalk treatments will be separated from the roadway by a grass buffer strip.

Bicycle and Pedestrian Treatments- A moderate level of treatment should be used when designing enhancements for bicycle and pedestrian traffic. Larger, multi-use paths should be used where possible, which will allow for additional room for pedestrians and bicycles. Multi-use paths create safer bicycle conditions while still allowing room for pedestrian traffic.

Landscape Treatments- Landscape treatments should be encouraged along the corridors and were suggested to be at a moderate to aggressive level of treatment. While the overall level of treatment is in the moderate range of the spectrum, the overall look and feel of the landscape treatment should be a natural planting theme. Preservation of existing vegetation rows, large specimen trees and native trees and shrubs will give the corridors a mature feeling. Areas of special interest can incorporate more aggressive planting treatments such as ornamental trees and shrubs as well as flowering perennials.

Lighting Treatments- The steering committee noted that a moderate level of treatment should be applied to lighting in the corridors. This treatment consists of using a consistent style of decorative light poles and traffic signal poles and arms to create an overall design aesthetic and theme for the town.

Wayfinding Signage Treatments- The treatment selected for wayfinding signage includes both vehicular and pedestrian scaled signs. Signage systems should be kept to a moderate level of treatment. Key destinations both on and off the corridors should be highlighted in the signage system.

Gateway Treatments- A minimal to moderate level of treatment was selected for key points along the corridors. This treatment should provide a striking and elegant gateway to the town. It was also noted that corridor gateways should take into account the existing Town of Westfield gateway structure being constructed at SR 32 and Gray Road.

Structural Enhancements- In areas where walls or bridges are included, additional enhancements should be moderate in treatment and should help to continue the design theme through the corridors.

CONCEPTUAL CORRIDOR ENHANCEMENTS

The selection of design inspiration is a key factor in establishing a unified design aesthetic for a project. Inspiration can come in many forms, and typically provides an easier selection of materials, shapes and forms. For the Westfield Corridor Master Plan, the right-of-way definitions were made by using an overriding theme, or vision. The spaces created were then further inspired by the rich culture and history of the town. By incorporating these two forms of design inspiration a stronger design vocabulary is created.

CREATING A NEW SUBURBAN PARKWAY STANDARD

As a response to the purpose and need for the project, an overriding goal was established to continually guide the project. This goal for the Town of Westfield Corridors Master Plan was developed based on information gathered from exercises with the steering committee, stakeholder interviews and input from the public.

As mentioned in Section 1 of this report, one of the main goals of this project was to make each corridor in Westfield a signature piece to the community, which established a unique character for the town, and promoted the access management and land use guidelines for the town. In order to create effective corridor enhancements and a safe, but efficient roadway system, the design team developed a concept statement that was directly related to the design and implementation of the corridor enhancements.

Historically, the term “parkway” has been identified as a roadway that was designed specifically with a naturalistic landscape of the median and adjacent land areas. The designation was meant to suggest a pastoral driving experience, isolated from the manifestations of commerce and advertising, even when the road passes through populated areas. Many parkways have signature road signs with special emblems that suggest a thematic driving experience and other devices used to create a sense of separation from civilization in the vicinity of the road.

Currently, parkways have been developed for several roadway corridors near the Town of Westfield. Hazel Dell Parkway was identified during the steering committee input phase as a prime example of the ideal corridor that was desired for Westfield. These corridors build upon the historic definition of a parkway including extended right of way limits to accommodate necessary travel lanes, raised medians, planted utility strips on each side of the corridor, pedestrian walks or multi-use paths on either side of the corridors, and additional property for screen plantings, utilities or signage.

A new suburban parkway guideline for use in the Town of Westfield. Specifically, the concept was based on the following design parameters:

- ◆ Create a more natural and sustainable landscape treatment
- ◆ Focus landscape plantings at key locations along corridors
- ◆ Emphasize pedestrian environments and details
- ◆ Create community specific- identifiers including secondary gateway elements, uniform light and signal pole standards and a wayfinding signage system

This master plan creates a new parkway guideline for the community which includes landscape medians and rights-of-way, pedestrian paths and unique materials treatments with a 120' right-of-way. Figure 2-4 illustrates the general cross section for this new parkway. The 120' cross section includes the following:

- ◆ 27'-6" travel lanes (two lanes each direction)
- ◆ 16' raised median
- ◆ 8' planted utility strip along each side of the street
- ◆ 8' pedestrian corridor along each side of the street (walk or multi-use trail)
- ◆ 8'-6" additional right of way beyond pedestrian walks which can include screen plantings or under and overhead utilities

This overriding theme helped drive the program development and became the basis for conceptual design inspiration and design development.

This typical parkway cross section should be applied to north-south and east-west corridors that are viewed as primary arterial corridors. The ample right-of-way will allow for efficient movement of large amounts of vehicular and pedestrian traffic. While the 120' right-of-way dimension is an ideal situation for these highly traveled corridors, the concepts included in that cross section can be applied in a variety of corridor situations. Where existing development restricts the acquisition of right-of-way, specific dimensions and enhancements can be modified or eliminated while still fitting within the overall design vocabulary of the parkway.

In addition, the enhancements in this standard can be applied to corridors of all sizes. Although the typical cross section is used to illustrate primary or secondary arterial corridors, the basic enhancement elements can be applied to secondary and local roadway systems as well. Figure 2-5 illustrates a modified cross section with a 90' right-of-way. The basic corridor elements still exist in this narrower cross section, but dimensions have been adjusted to fit a more constrained area.

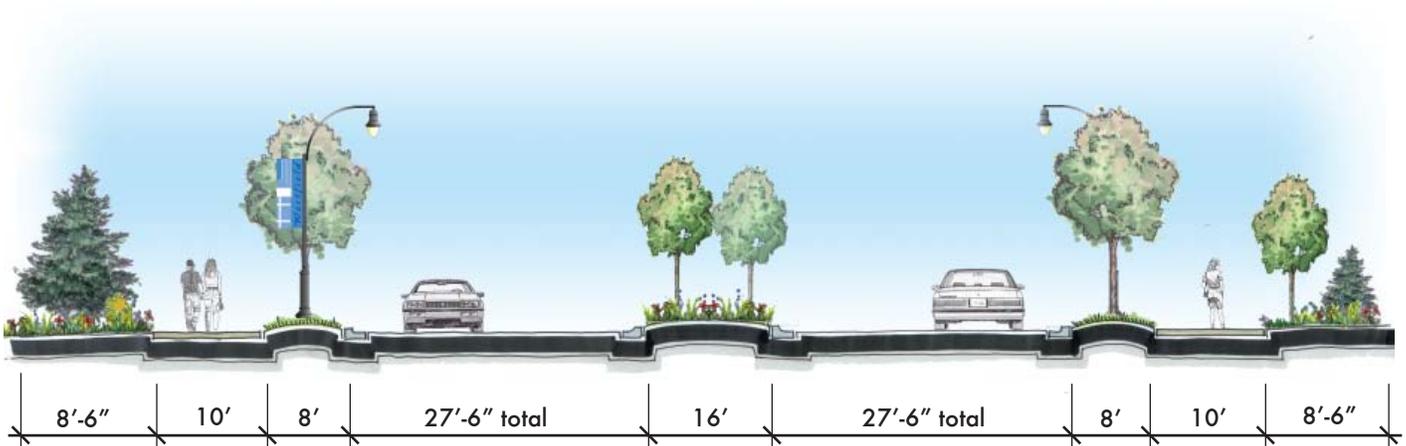


Figure 2-4: The ideal parkway cross section contains a 120' right-of-way.

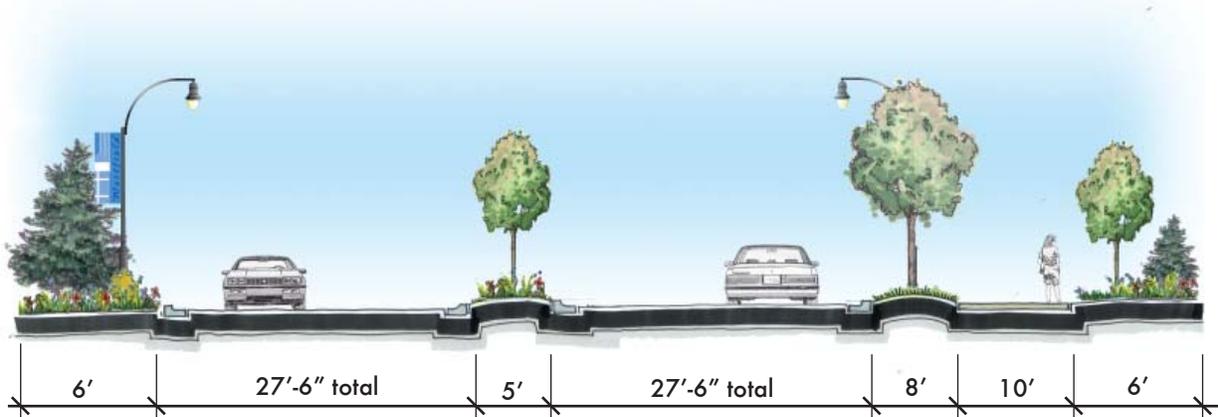


Figure 2-5: The ideal parkway cross section contains a 90' right-of-way.

CREATING A TOWN IDENTITY

Historic Design Inspiration

While the roadway profile itself drew inspiration from the naturalistic parkways found throughout the country, the corridor enhancement elements drew inspiration from the rich, cultural heritage of the town itself. The Town of Westfield was founded on May 6, 1834 by Asa Bales, Ambrose Osborne and Nathan Parker, all Quakers from North Carolina. These three individuals brought with them a set of beliefs and practices unique to their religious group. The Quaker belief began in England in the 17th century by people who were dissatisfied with the existing denominations and sects of Christianity. The various branches of the religion have widely divergent beliefs and practices, and many individual Quakers develop individual religious beliefs based on their own conscience and revelations.

It is this unique group of people and beliefs that drove the design team when it came to selecting a material palette for the corridors. Quakers are synonymous with the idea of plainness, and in fact the Quakers strived to live a simple life in both outward appearance and in their speech. Since the Town of Westfield holds this culture as part of their history, it only made sense to create enhancements that would create the needed statement, but in a simplified and moderate approach. In order to achieve this, the design team chose a material palette of both natural materials and subdued colors. Traditional concrete and asphalt were chosen as standard pavements, while reddish-brown colored brick pavers were chosen to add a subtle, yet striking color difference. In addition, limestone, a native material to Indiana, was chosen to compliment the colors and finishes of the pavement choices. Figure 2-6 and 2-7 illustrate the historic ties between the Quaker inspiration and the chosen material palette.

Westfield was not only the home to many Quaker families, but also the home to Underground Railroad stations and routes. It is believed that abolitionist supporters in the town guided African slaves to freedom from 1810 to 1850. The underground railroad was a network of clandestine routes by which slaves attempted to escape to free states, or as far north as Canada, or south to Mexico. At its height, an estimated 30,000 to 100,000 people escaped enslavement. While the routes and stopping points were kept secret, a series of "signs" were developed to signalize the route. It is known that safe havens were "announced" by attaching a lantern to nearby hitching posts. By following a series of lanterns, slaves were able to navigate themselves to safety. Westfield has embraced this history and incorporated the lantern image into their new town gateway located at SR 32 and Gray Road. The design team used the image and symbolism of the lantern, shown in Figure 2-8, to inspire several corridor enhancements.



Figure 2-6: The idea of simplistic nature of the Quaker principles inspired the material palette for the corridors master plan.



Figure 2-7: Brick and limestone currently existing in the facades of historic buildings in downtown Westfield.

By utilizing two diverse and rich histories, the design team was able to create simple, subtle, yet striking pavement and gateway treatments. These treatments will not only provide a unified look to the town, but will also fit in with existing structures found throughout town.

Material Palette

The intersection material palette is simple, yet makes a much needed statement through color and texture. Broom finished concrete and brown brick pavers are a simple, yet stark contrast to one another. By utilizing these materials in crosswalks and pedestrian nodes, vehicular traffic will have a heightened awareness of pedestrian crossing areas. These materials are seen at all signalized intersections along the corridors, as well as at designated gateway intersections and both regional and local trail crossings. A modified material palette is used at secondary intersections along the corridors.

Where vegetation does not currently exist, ornamental trees native to the area are proposed. These species will fit in with the existing plantings and will provide a seamless planting scheme to the corridors. In addition to trees, native shrubs, grasses and perennials will also be used to create a layered landscape that enhances the overall identity and provides visual emphasis to key points along the corridors. Sample materials and planting types are shown in Figure 2-9 and 2-10.

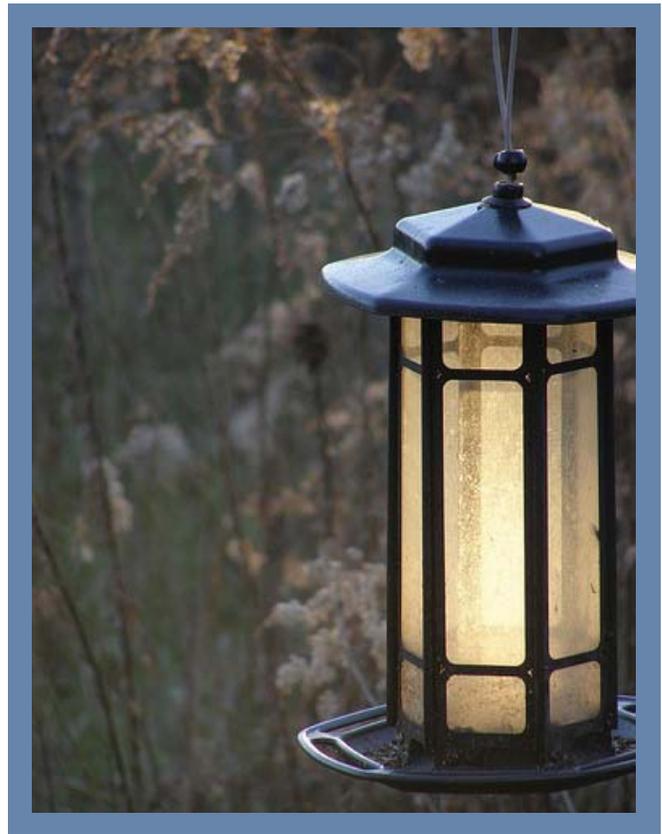


Figure 2-8: The underground railroad inspired the design team to create a modern day lantern for the corridors.



Figure 2-9: Simple and complimentary materials help make the intersection treatments successful along the corridors.



Figure 2-10: Planting treatments at the intersections are used to provide added color and interest while keeping a unified, natural aesthetic.

CONCEPTUAL CORRIDOR ENHANCEMENTS

A series of enhancement concepts were developed for the corridor that reflects the analysis and input received from the community, staff and steering committee. When these concepts are applied to a prototypical right-of-way, design guidelines emerge that can be used throughout the community. The set of guidelines developed for the corridor master plan are an important tool for the Town of Westfield. Design guidelines provide the unique opportunity to influence the visual character of a corridor before it is built, promoting high quality and unique design treatments that reinforce the community's vision for the corridor.

The intent of the design guidelines is to set standards to help guide the future design and construction of roadway corridors within the town. These guidelines build on the overall vision of a corridor and help to further enhance the parkway design elements. The result of utilizing these design guidelines along each corridor will be a high-quality design statement along an entire corridor that attracts and maintains a similar high-quality level of development. These corridor enhancements are a collection of ideas meant to provide a visual distinction between Westfield and surrounding communities.

It is intended that these corridor enhancement recommendations be applied throughout the course of each corridor's development and it is understood that this may be a long process. The recommendations contained in this document are meant to serve as guidelines. They are not meant for construction; rather they are meant as a visual guide for designers and decision makers. Construction details should be developed during the final design phases of each segment of the project.

Corridor enhancement concepts were developed for the following items:

- ◆ Raised Medians
- ◆ Landscape Treatments
- ◆ Pedestrian Treatments
- ◆ Ornamental Lighting
- ◆ Intersection Treatments
- ◆ Secondary Gateway System
- ◆ Wayfinding Signage System
- ◆ Trail Crossing Treatments

These corridor enhancements were then broken down into two broad categories:

Standard Enhancements deal with specific enhancements applied consistently to the entire corridor. These enhancements affect the look and character of the entire roadway. For this study, these included raised medians, landscape treatments, pedestrian treatments, and ornamental lighting and signal poles.

Special enhancements are those that go beyond the typical roadway applications and provide unique treatments at very specific spaces along the corridor. These enhancements reinforce character, create added interest at specific locations and typically provide very specific functions for portions of the corridor. Special enhancements recommended for the Town of Westfield include intersection treatments, community gateways, wayfinding signage systems and pedestrian amenities.

The following corridor enhancement concepts are broad ideas used to create a unique identity for the Town of Westfield. These drawings are general in nature and are meant to illustrate the typical dimensions and treatments of each enhancement. In Section 4 of this report, the following corridor enhancements are applied to two prototypical corridors; Oak Ridge Road and Carey/Grassy Branch Road, to further illustrate the typical applications of the conceptual corridor enhancements.

STANDARD ENHANCEMENTS

The following are standard corridor enhancements and are meant to be applied consistently to the entire corridor. These enhancements, when applied, affect the entire corridor and generate a continuous design aesthetic.

RAISED MEDIANS

Raised medians offer access management controls for the roadway, while creating additional enhancement opportunities as well. The overall width of the median is 16' and includes a concrete curb on both sides. The median areas are reserved for moderate landscape treatments which will be discussed later in this section. Where the median tapers to accommodate a left turn lane, the planting areas tapers as well and transitions to a complete raised area of colored pavers. An irregular landscape design of the medians will allow a natural vegetation pattern to be applied. The typical roadway median treatments are illustrated in Figures 2-11 and 2-12.

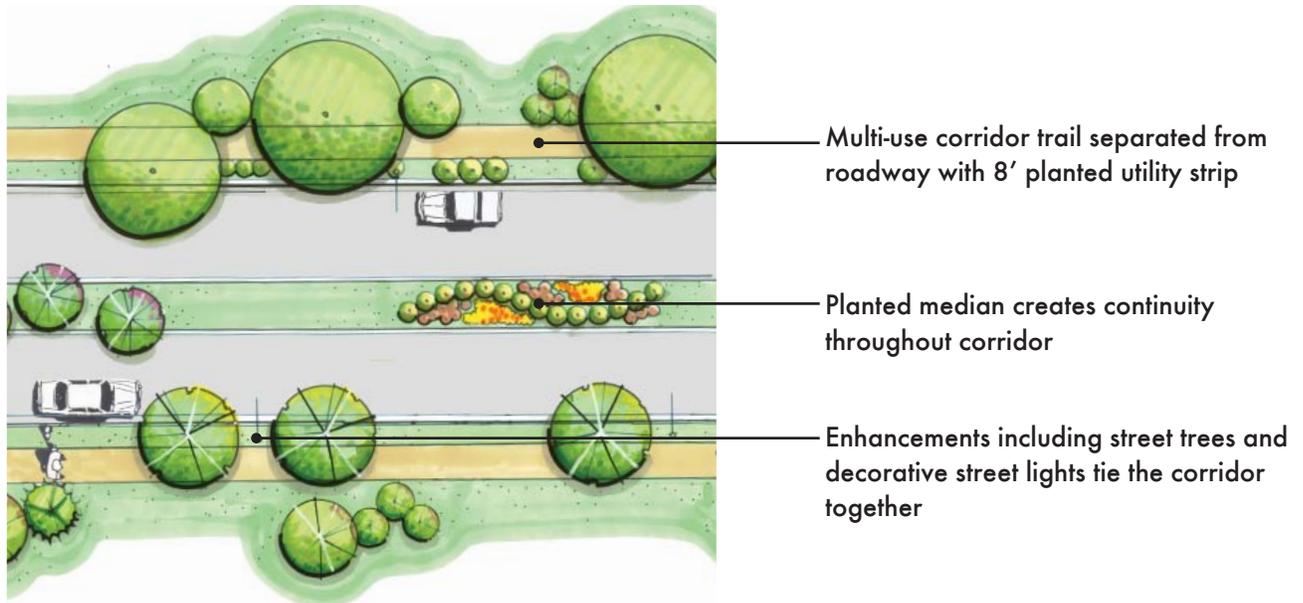


Figure 2-11: Raised median treatments, illustrated in this typical plan, allow for efficient access management techniques while accommodating enhancement opportunities.

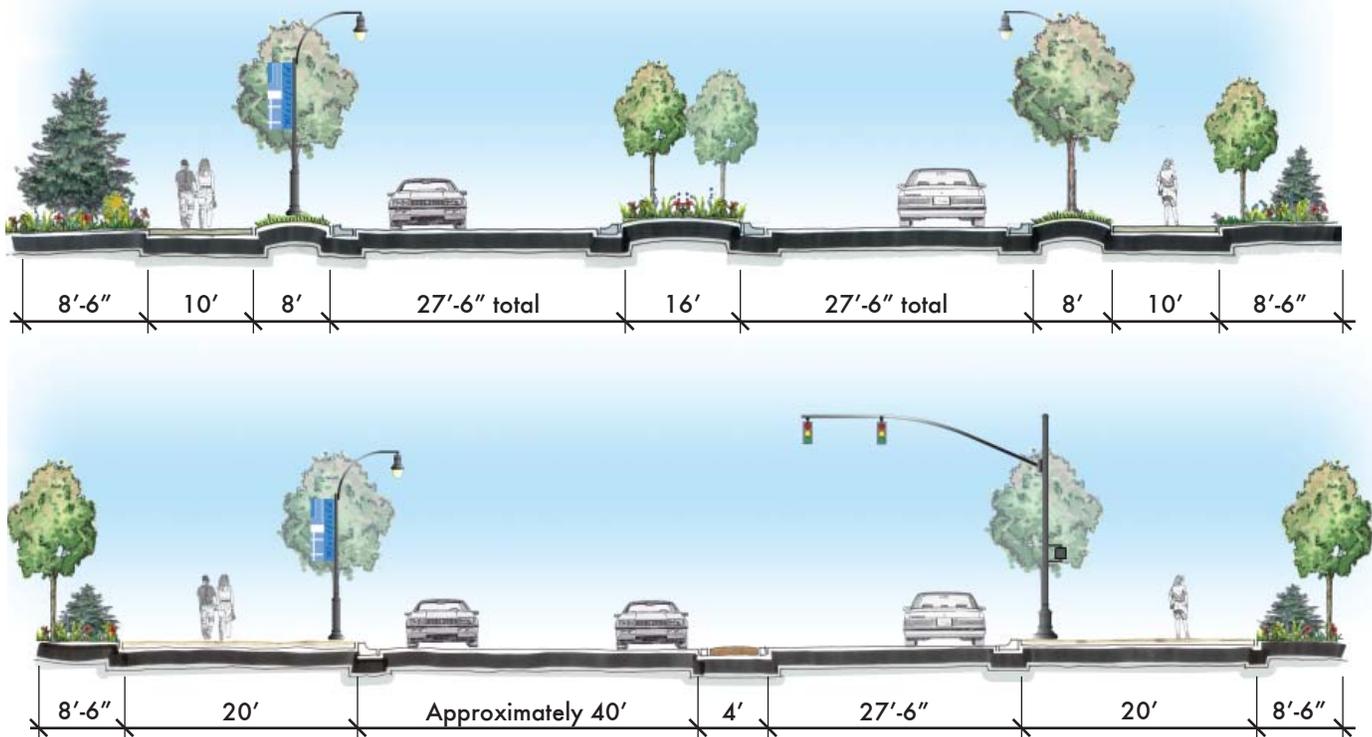


Figure 2-12: Typical cross-sections illustrating how the raised median enhancements should be applied to roadway corridors with 120' right-of-ways.

LANDSCAPING TREATMENTS

Corridor Landscaping

A moderate to aggressive level of treatment was selected for all landscape areas within the right-of-way in order to provide richness in the look and feel of the corridor. Landscape treatments are proposed for the 8' buffer strip, right-of-way areas on the outside of the roadway as well as in the raised medians. To create a more inviting and natural entryway to the town, existing plantings should be retained where possible to create an establish, mature aesthetic. In addition, shade trees, evergreen trees and shrubs have been placed at irregular intervals to fill in any vegetation gaps along the corridor. Additional plantings added to the corridor should mimic the spacing and size of the existing vegetation masses along the corridors. This treatment takes place on both sides of the road way within the 8' planted utility strip and on the outside of the multi-use trail. Planting treatments within the planted utility strip and outside of the trail are illustrated in Figure 2-13 and 2-14.

Planting treatments are also included in the medians. Ornamental trees are shown and spaced in irregular groves of three to four trees. In addition to the ornamental trees, evergreen shrubs, ornamental grasses and native perennials are included to give the median an aesthetic appeal but also a natural look. These natural planting masses will be planted throughout the median at irregular intervals to achieve a natural planting scheme that will compliment the existing vegetation along the corridor. Specific areas within the median will also feature colorful shrubs and perennials. These plantings will not only enhance the median they will also provided visual interest to key areas along the corridors. Median planting treatments are illustrated in Figure 2-13. Planting species will be chosen according to specific locations along the corridor. Height, width, growth characteristics and maintenance needs will all be considered when determining final plant species.

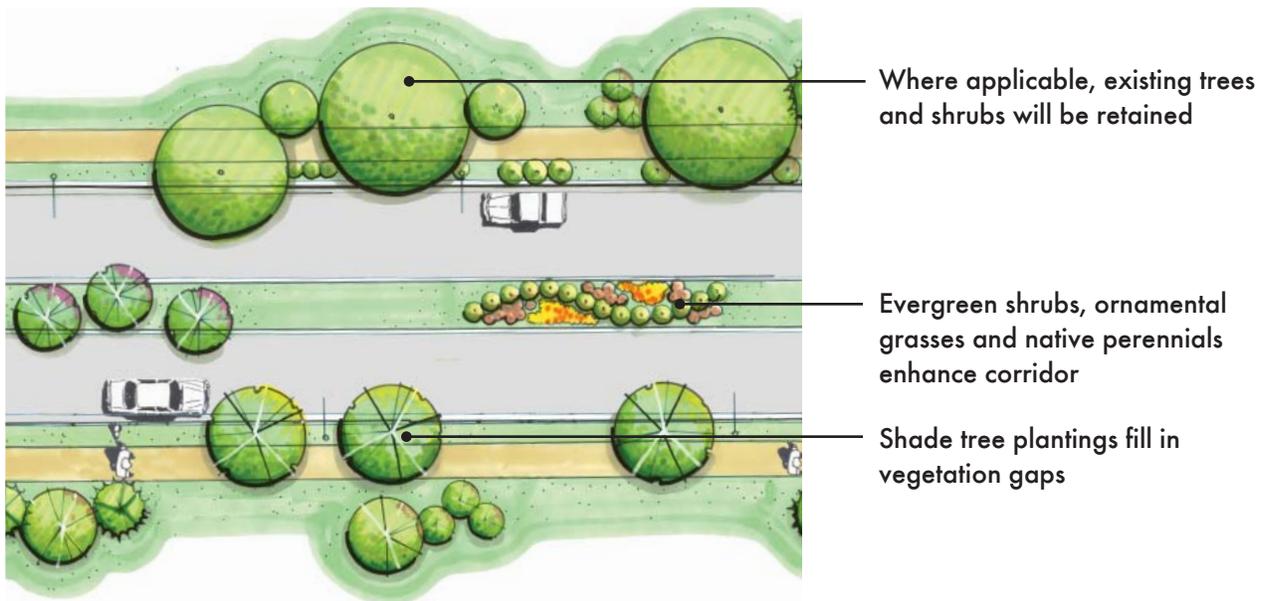


Figure 2-13: Typical plan illustrating the preferred landscape treatments along each corridor.

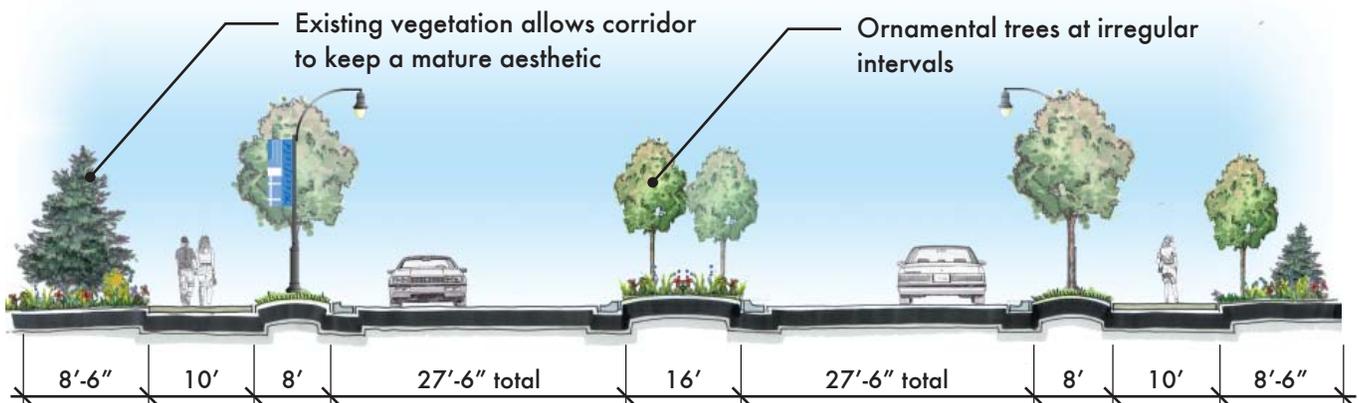


Figure 2-14: Typical cross-section illustrating the typical landscape application to a 120' right-of-way.

Roundabout Landscaping

There are several locations within the Town that roundabouts may be used as an alternative to a signalized intersection. At these locations ornamental plantings will be used to heighten the attention of drivers. Planting treatments will be included in the medians that approach the roundabout and will transition to colored paver crosswalks to allow for pedestrian traffic. Ornamental trees are shown and spaced in irregular groves of three to four trees in the raised median. In addition to the ornamental trees, evergreen shrubs, ornamental grasses and native perennials are included at the termination of the medians to add an aesthetic and natural look. These plantings will be kept low to ensure appropriate site distances around the intersection. The center of the roundabout will be planted with evergreen shrubs, ornamental grasses and native perennials in a cascading pattern. Lower plants will be placed on the outside with slightly larger plants being reserved for the center. These plant choices keep in harmony with the rest of the corridor while creating a low maintenance area of vegetation. The planting choices will also provide seasonal interest and will visually compliment the gateway lantern that is proposed for the center. Ornamental trees are not proposed for the outside of the intersections to ensure appropriate sight distances. Roundabout planting treatments are illustrated in Figure 2-15 and 2-16.

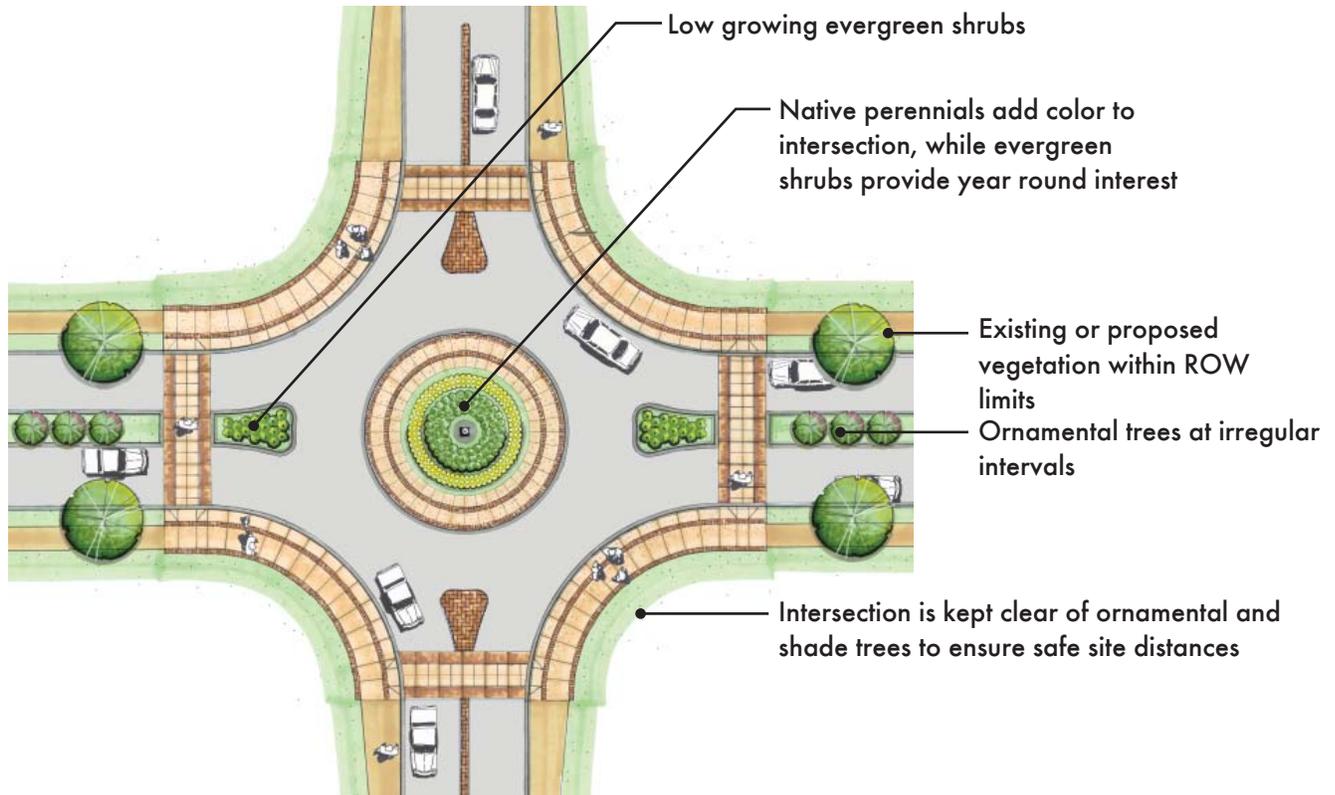


Figure 2-15: Typical plan for roundabout landscape treatments.

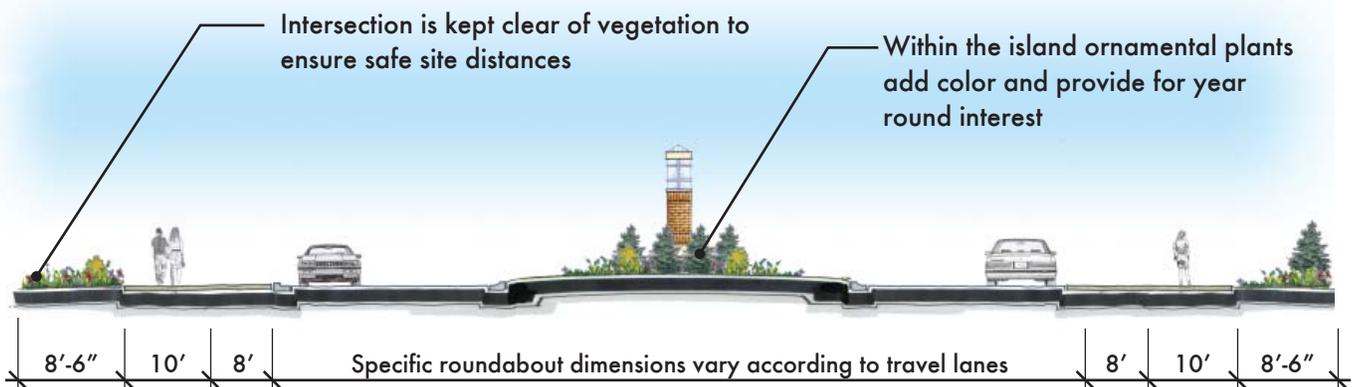


Figure 2-16: Roundabout intersections will feature native and ornamental landscaping to place additional emphasis on these locations.

Plant Palette

There are several existing fence rows and groves of trees along the corridors that can be incorporated into the final alignment and design. These existing areas of plantings will provide a mature aesthetic to the new construction and will provide additional screening to existing neighborhoods and businesses. In areas where vegetation will need to be removed, or where vegetation does not currently exist, large shade trees native to the area are proposed. These species will fit in with the existing plantings and will provide a seamless planting scheme to the corridors. In addition to trees, native shrubs, grasses and perennials will also be used to create a layered landscape that enhances the corridors as a whole and also provides visual emphasis to key points along the corridors. Typical planting types are shown in Figure 2-17-2-19, while a complete list of proposed trees, shrubs and perennials is listed in Appendix C.



Figure 2-17: Existing vegetation along the corridors will be preserved where possible to provide a mature visual aesthetic.



Figure 2-18: A mixture of shade, evergreen and ornamental trees will be used along the corridor to provide a natural aesthetic.



Figure 2-19: Perennials and ornamental shrubs will be used at key locations to provide added visual interest.

CORRIDOR PEDESTRIAN TREATMENTS

The following pedestrian amenities should be applied to all corridors within the town. The illustrations are meant to depict the right-of-way needs for a multi-use path system. The following pedestrian recommendations can be used to guide pathway development associated with new subdivisions or commercial development. In areas where development has not yet occurred, these illustrations can be used to determine approximate right-of-way widths needed to incorporate the pathways.

Pedestrian Trails and Walks

Pedestrian amenities are integral to the overall transportation network within and beyond the corridor. Not only do these amenities play an important role in establishing a pedestrian-friendly network, but they are crucial in establishing connectivity throughout the town. Pedestrian and bicycle connectivity is a high priority for Westfield and to accommodate that need, 10' wide multi-use pathways are proposed for both sides of the roadway corridor. These pathways will be constructed out of asphalt and will unify the series of pathways already established along many of the town's corridors. The pedestrian paths are separated from the roadway by an 8' planted utility strip. In addition to the multi-use paths, increase pedestrian and bicycle traffic has been accommodated at intersections and trail crossings. These areas will be described later in this section. Figure 2-20 and 2-21 illustrates the 10' multi-use path system.

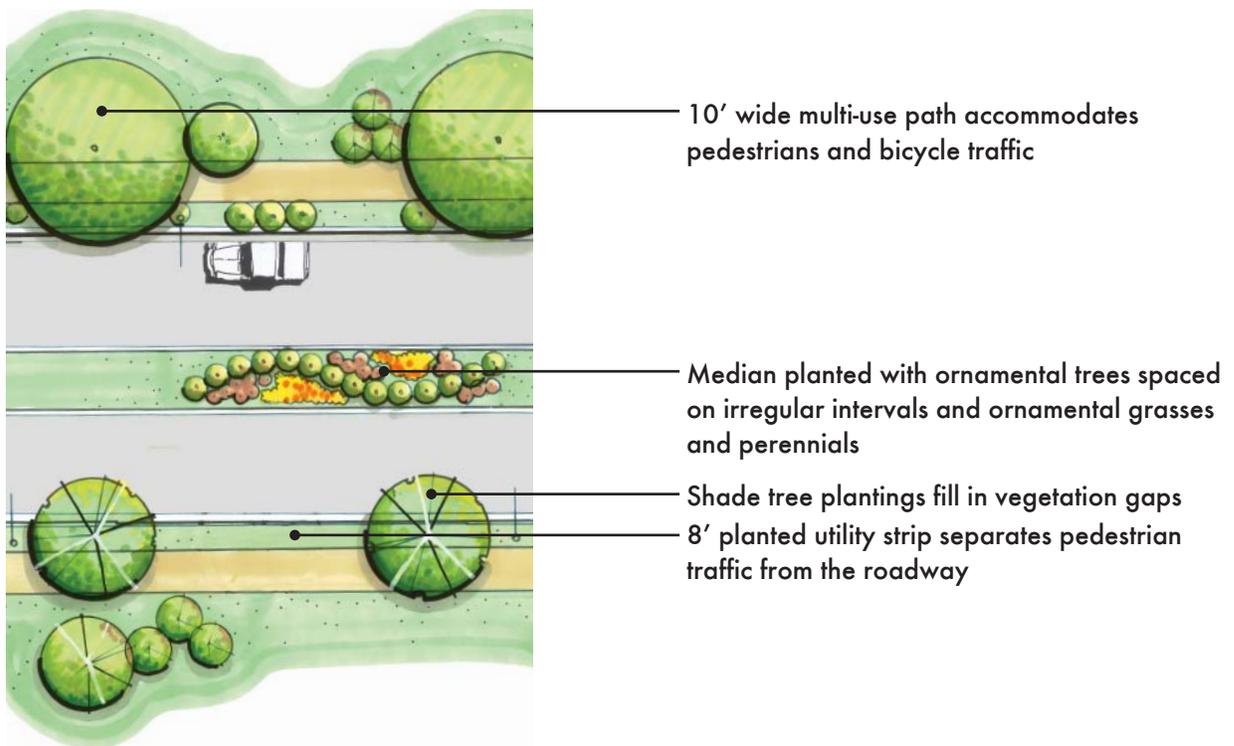


Figure 2-20: Typical plan illustrating how multi-use paths are incorporated into each corridor.

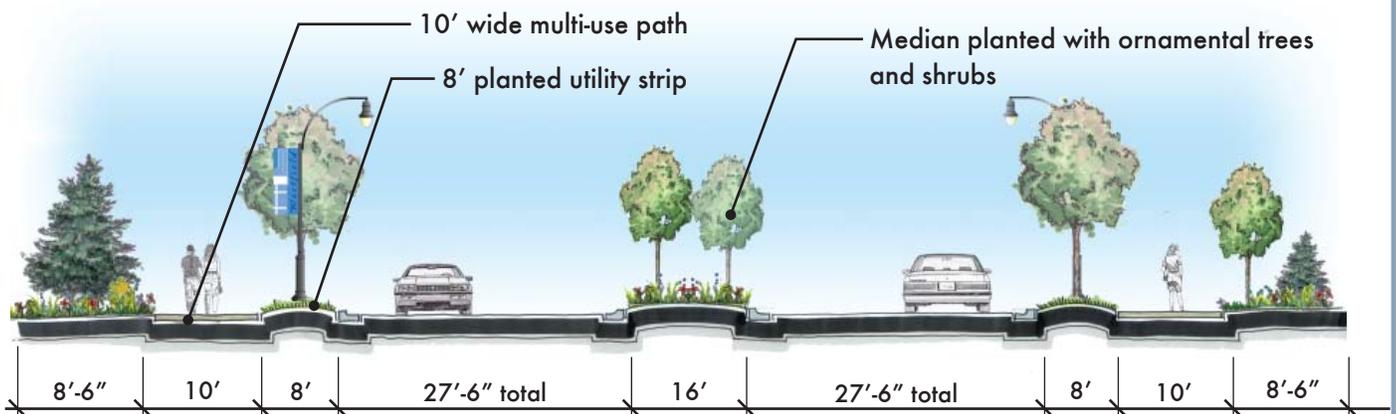


Figure 2-21: Typical cross-section illustrating how multi-use paths are incorporated into each road section.

Pedestrian Nodes

With the addition of multi-use pathways along each corridor, a community wide trail system will be developed. To accommodate this expanded trail system, pedestrian nodes are recommended at major intersections. This additional paved area at intersections will allow a safe place for additional pedestrian and bicycle traffic to wait before crossing the intersection. At major intersections, this pedestrian node consists of scored concrete with ornamental brick paver bands. At non-signalized intersections this same pattern is used without the ornamental brick pavers. Also at the pedestrian nodes are wayfinding signage panels to direct vehicular and pedestrian traffic through the area. Where space allows, pedestrian furniture can also become an integral part of the node. Figures 2-22 and 2-23 illustrate the treatment of pedestrian nodes at both signalized and non-signalized intersections.

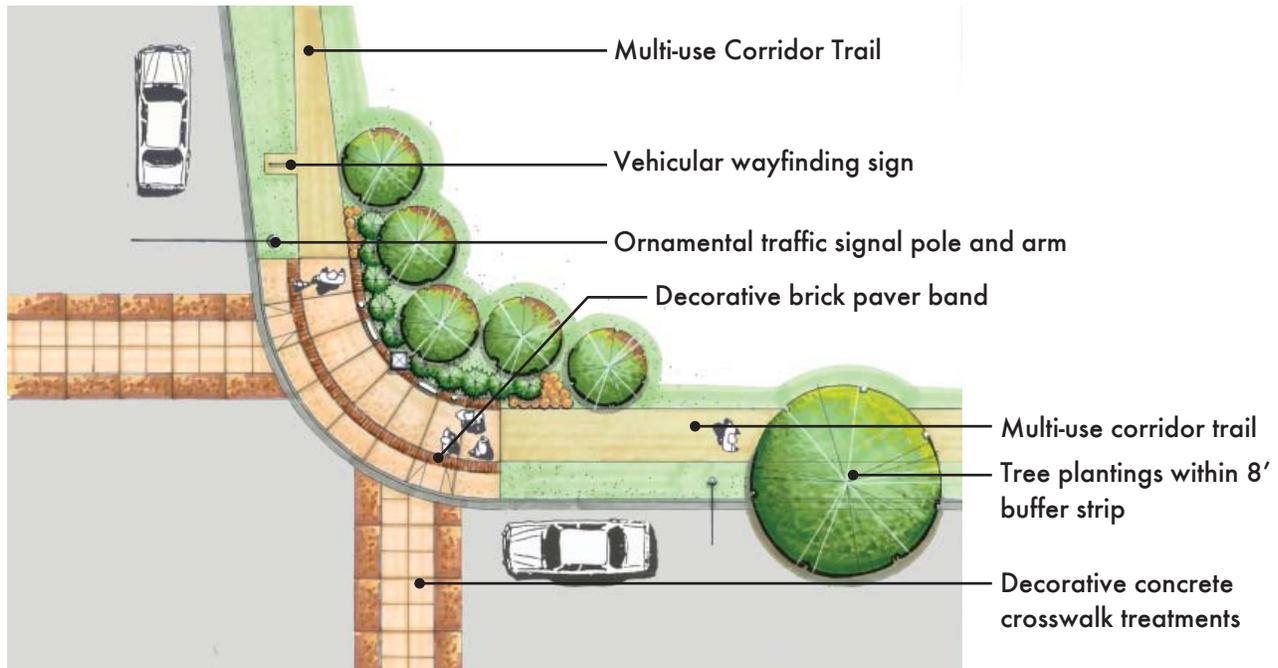


Figure 2-22: Typical plan of pedestrian areas at signalized intersections.

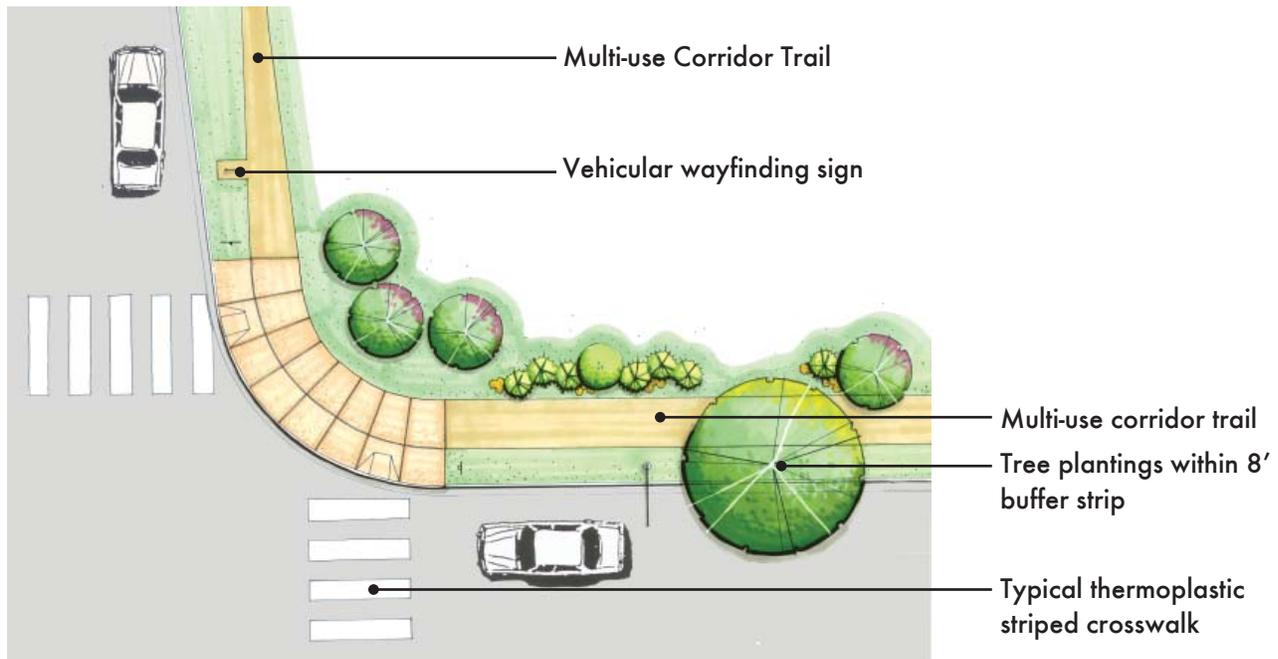


Figure 2-23: Typical plan of pedestrian areas at non-signalized intersections.

Regional Trail Crossings

Pedestrian connections throughout town are even more critical given that two regional trail systems cross several main corridors. The Midland Trace and Monon Greenway systems connect various communities through central Indiana and pedestrian and bicycle traffic on these routes will only increase as time goes by. At these various locations further enhancements should be utilized to set the crossings apart from other intersections in the neighborhood and to provide additional safety to pedestrians and trail users. In order to protect the integrity of the historic rail corridor, regional trail crossings will be allowed to continue across the corridor utilizing existing rail corridors. Additional pedestrian paving treatments have been added to increase the safety in these areas along with additional signage. At each trail crossing, a pedestrian node is proposed that serves as visibility and a trail head, and also a place for individuals to stop, rest and get trail and community information. At each node, pedestrian pavement is used to create a large area of refuge for trail users. This area is constructed of concrete and brick paver bands, similar to those at the primary intersections along the corridor. Decorative bollards are included at the trailheads to prohibit vehicular traffic from turning onto the trail and to also alert trail users to the crossing. Regional trail crossing treatments are illustrated in Figures 2-24, 2-26 and 2-27.

Gateway lanterns, which are discussed later in this section, are also found within each node and in the median. These three lanterns, when seen together from the corridor, mark the crossing for pedestrian and vehicular traffic. Plantings are used to amplify the visibility of major pedestrian crossing locations, and are also used to control pedestrian crossings to very specific locations on the corridors. Pedestrian wayfinding signs and site furniture are also located within the pedestrian node. Wayfinding signage will be used to direct regional trail traffic into Westfield, as well as show a larger context within the trail system.

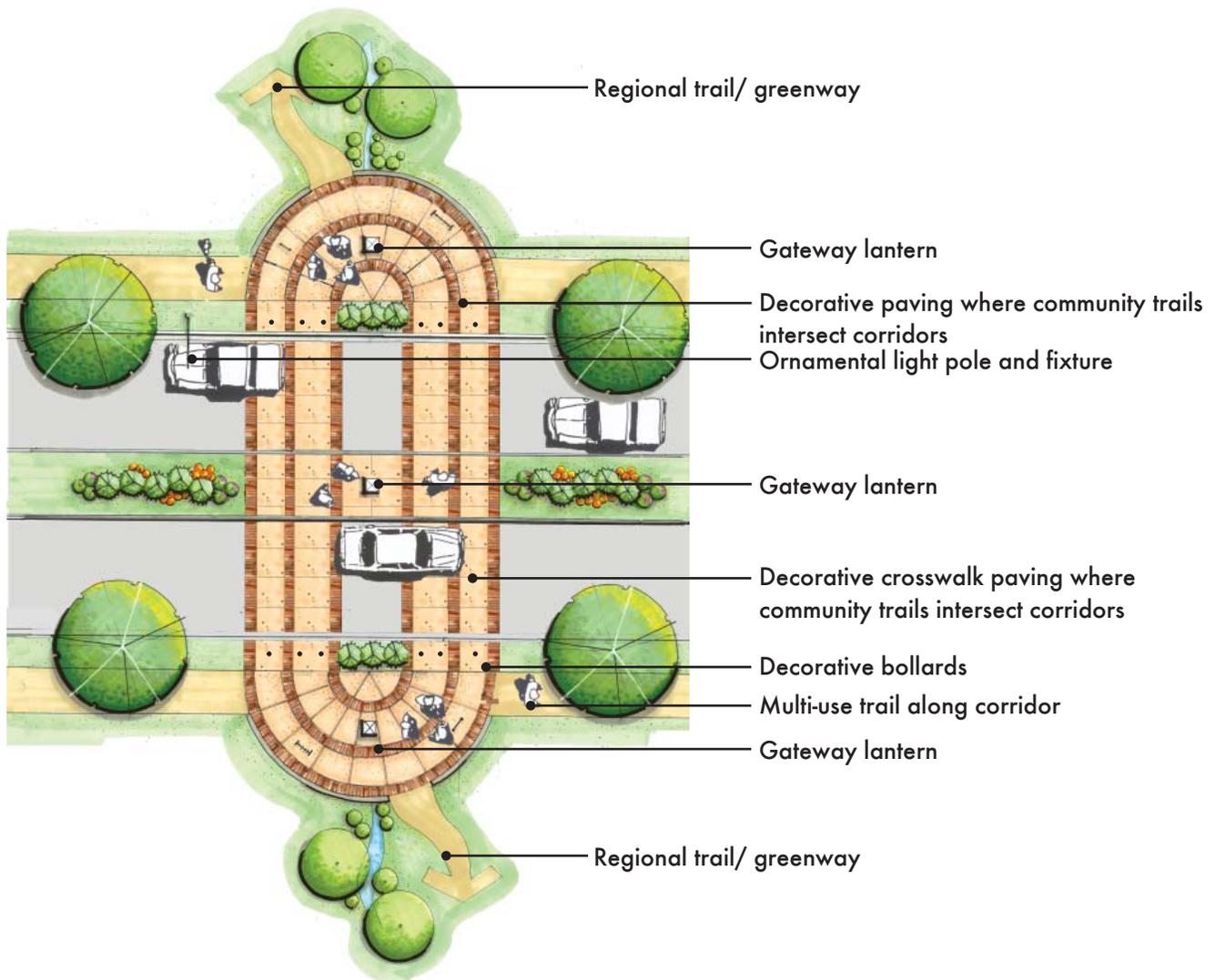


Figure 2-24: Typical plan of regional trail crossings, illustrating enlarged trailheads and widened pedestrian crosswalks. Design enhancements are intended to heighten driver awareness of crossings to ensure safety for trail users

Local Trail Crossings

In addition to the regional trail crossings, local trails, created by the multi-use pathways are also present. These trail systems connect small commercial and business developments to the neighboring communities and subdivisions. At various locations, these pathway systems will intersect main north-south and east-west corridors, and these locations should also be utilized to set the crossings apart from other intersections in the neighborhood and also to provide additional safety to pedestrians and trail users. Additional pedestrian paving treatments have been added at these locations to increase the safety for trail users. At each trail crossing, a pedestrian node is proposed that serves as visibility and a trail head, and also a place for individuals to stop, rest and get trail and community information. Rather than providing a larger paved crosswalk across the roadway, trail users are directed to nearby controlled intersections for crossing. Heavy plantings within the 8' utility strip are used to control pedestrian crossings, and to provide further visibility of the area. Gateway lanterns, along with ornamental plantings within the median are also used at local trail crossings. Local trail crossings are illustrated in Figures 2-25- 2-27.

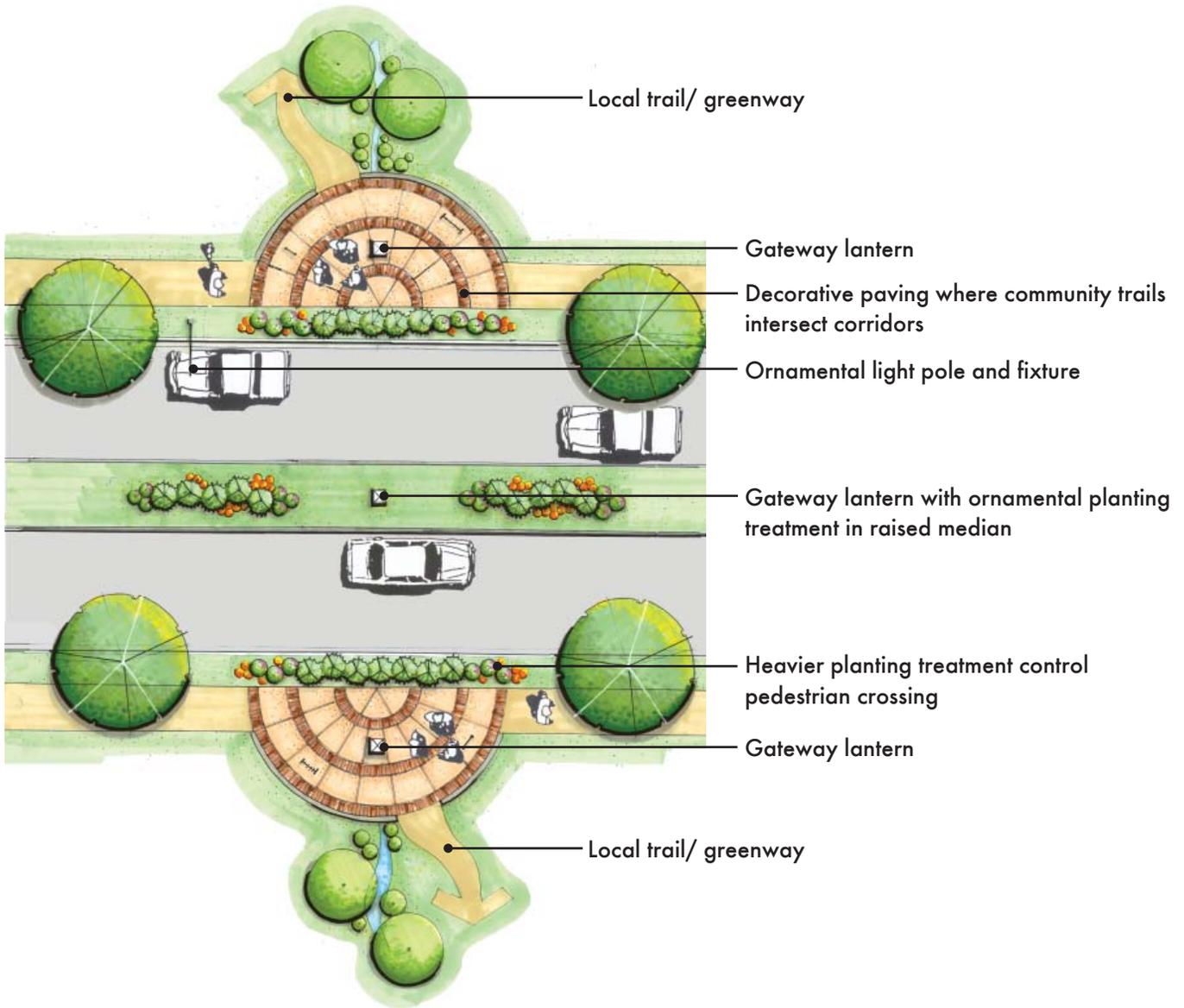


Figure 2-25: Typical plan of local trail crossings, illustrating enlarged trailheads and plantings. Design enhancements are intended to heighten driver awareness of the trailhead to ensure safety for trail users.

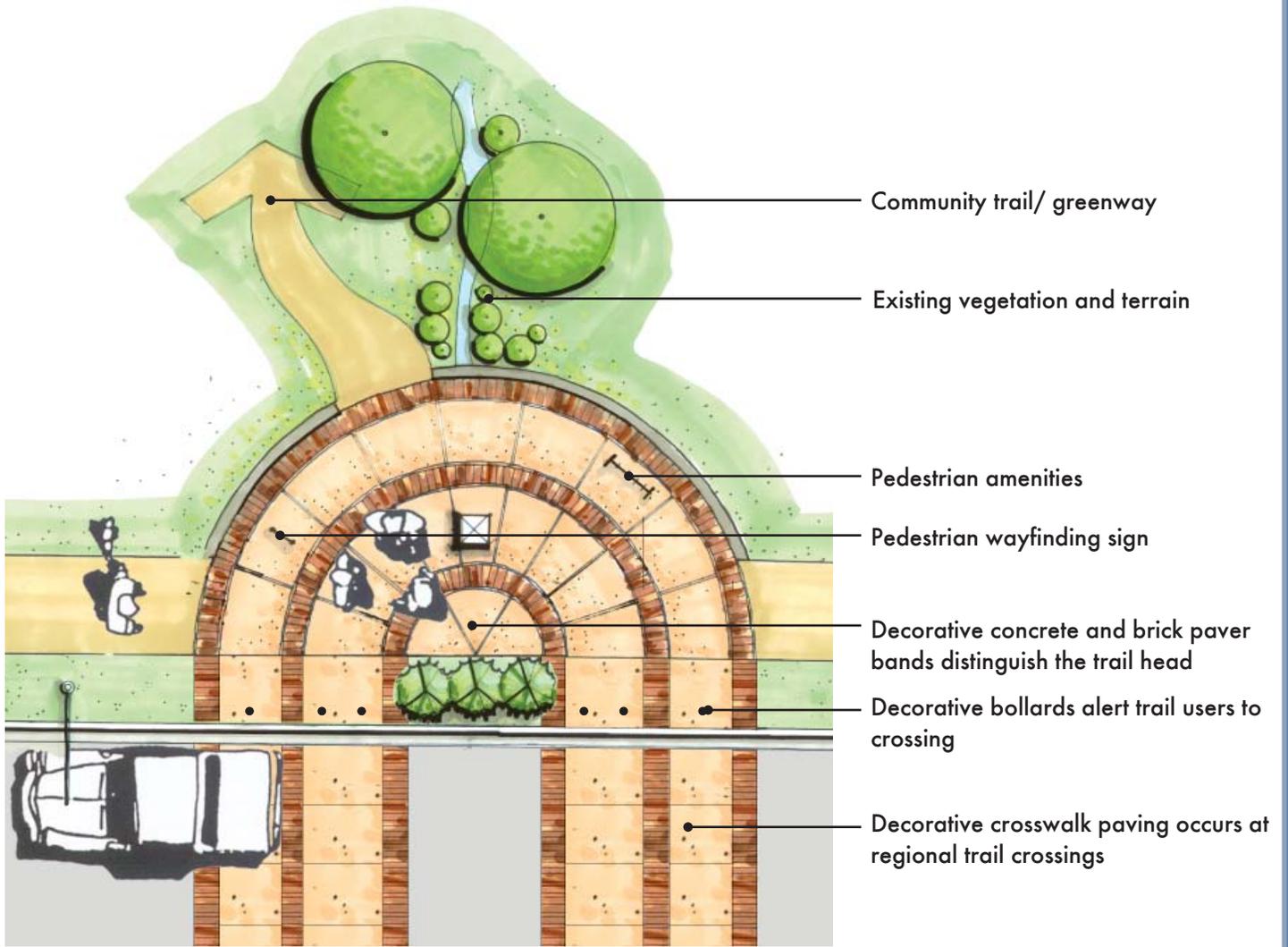


Figure 2-26: Enlarged plan of pedestrian nodes at regional and local trail crossings. The trailhead provides amenities for trail users while also providing a safe crossing location across the corridor.

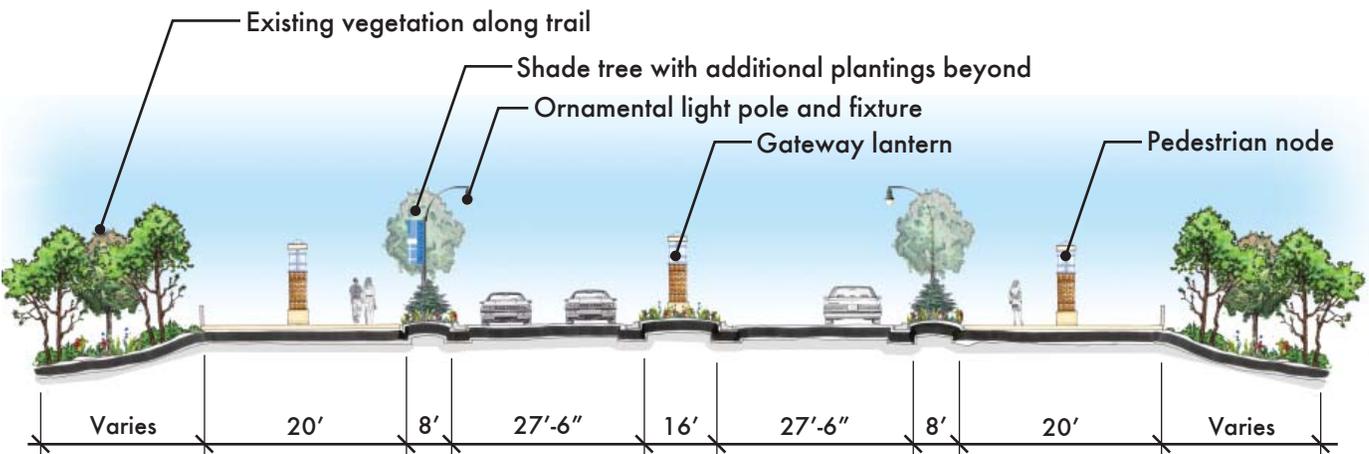


Figure 2-27: Typical cross section illustrates the crossing of regional and local trails. The three gateway lanterns visually announce the crossing to vehicular traffic in the area. Median and utility strip plantings are eliminated at regional trail crossings to allow for additional hardscape pavement and visibility.

CORRIDOR LIGHTING TREATMENTS

Decorative Light Poles

Lighting features are a necessary component of any major roadway and provide the opportunity to create a safe and unified character for the corridor. Ornamental features can be applied to the light poles in a very simplistic manner, yet create a strong and lasting character. A single design for ornamental lighting will help to achieve a cohesive design character along the lengths of all corridors. The lighting style was inspired by the historical setting of Westfield and the light fixtures are an abstract interpretation of the lantern typically found along the underground railroad. Currently, a separate corridor lighting standard is being drafted that will describe in detail the standard fixtures and specifications for all light fixtures within the town. A family of light fixtures and bases has been chosen that can be applied to corridors and developments in the town that will create a unified look, while minimizing maintenance for the Town. Figures 2-29- 2-31 depict the chosen pole and fixture appropriate for a primary or secondary arterial application. While this pole fits the ideal parkway application, other corridors may be better suited by another fixture from the family and final selections will need to be made during specific design projects.

These ornamental poles and fixtures are conceptually being placed every 100' along both sides of the corridor. Additional design and lighting studies will need to be completed to determine exact locations for the poles.

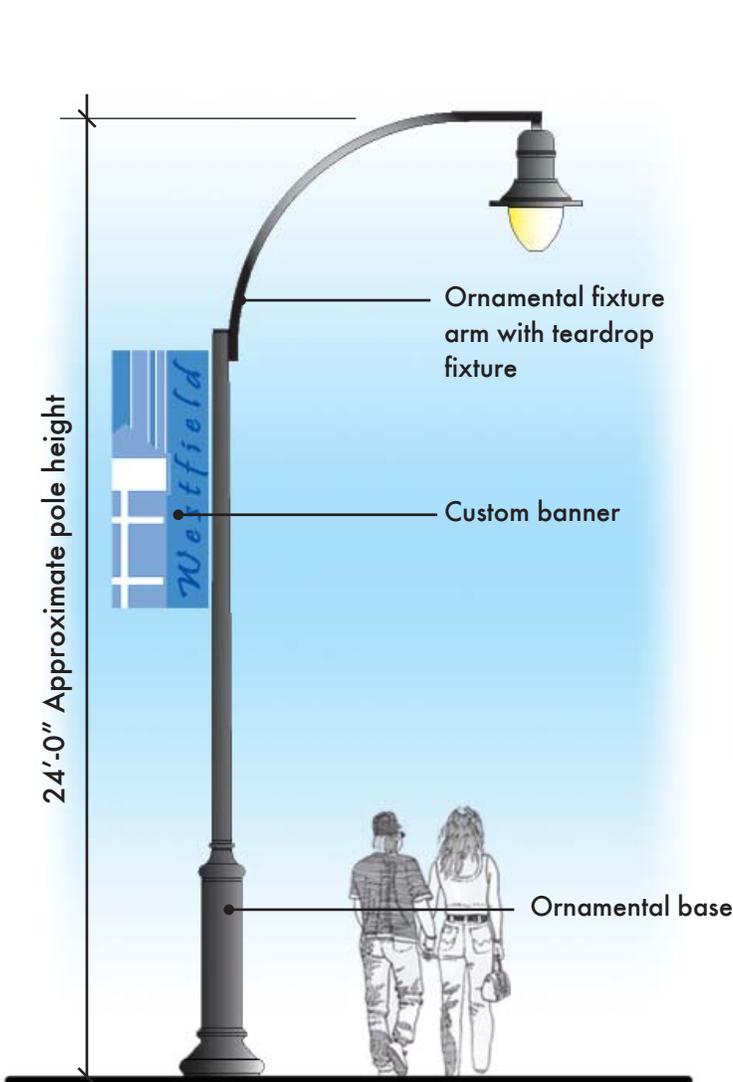


Figure 2-29: Typical elevation of the contemporary light pole and fixture selected for all corridors within the town.



Figure 2-30: Typical teardrop fixture with black powdercoat finish.

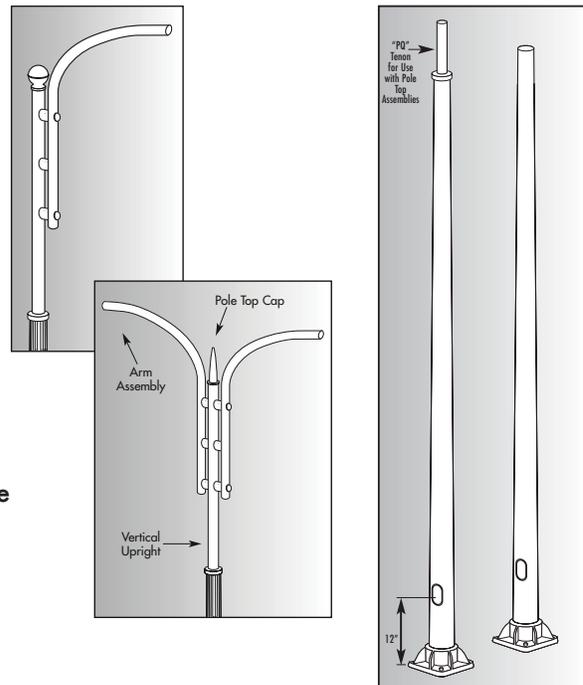


Figure 2-31: Typical pole and fixture arm style with black powdercoat finish.

Decorative Signal Poles

A consistent signal pole concept was created to further unify the corridor visually. A standard (non-custom) pole was selected to meet the level of investment desired by the community. Specific finishes and treatments were then incorporated into the pole design to give the pole a more unique and custom look.

Ornamental traffic signal poles are required at all primary intersections along the corridor. In addition, all signal poles should be consistent in their manufacturing techniques and materials. A black, powder-coated finish has been selected for the signal and light poles to continue with the classic character of the corridor. In addition pedestrian signals should be integrated into all poles that are located at crosswalks.

The selected poles contain the same bolt circle patterns as typical INDOT signal poles to allow immediate replacement by the proper authorities should one of the poles be struck by a vehicle. Figure 2-32 illustrates the signal pole and its features.

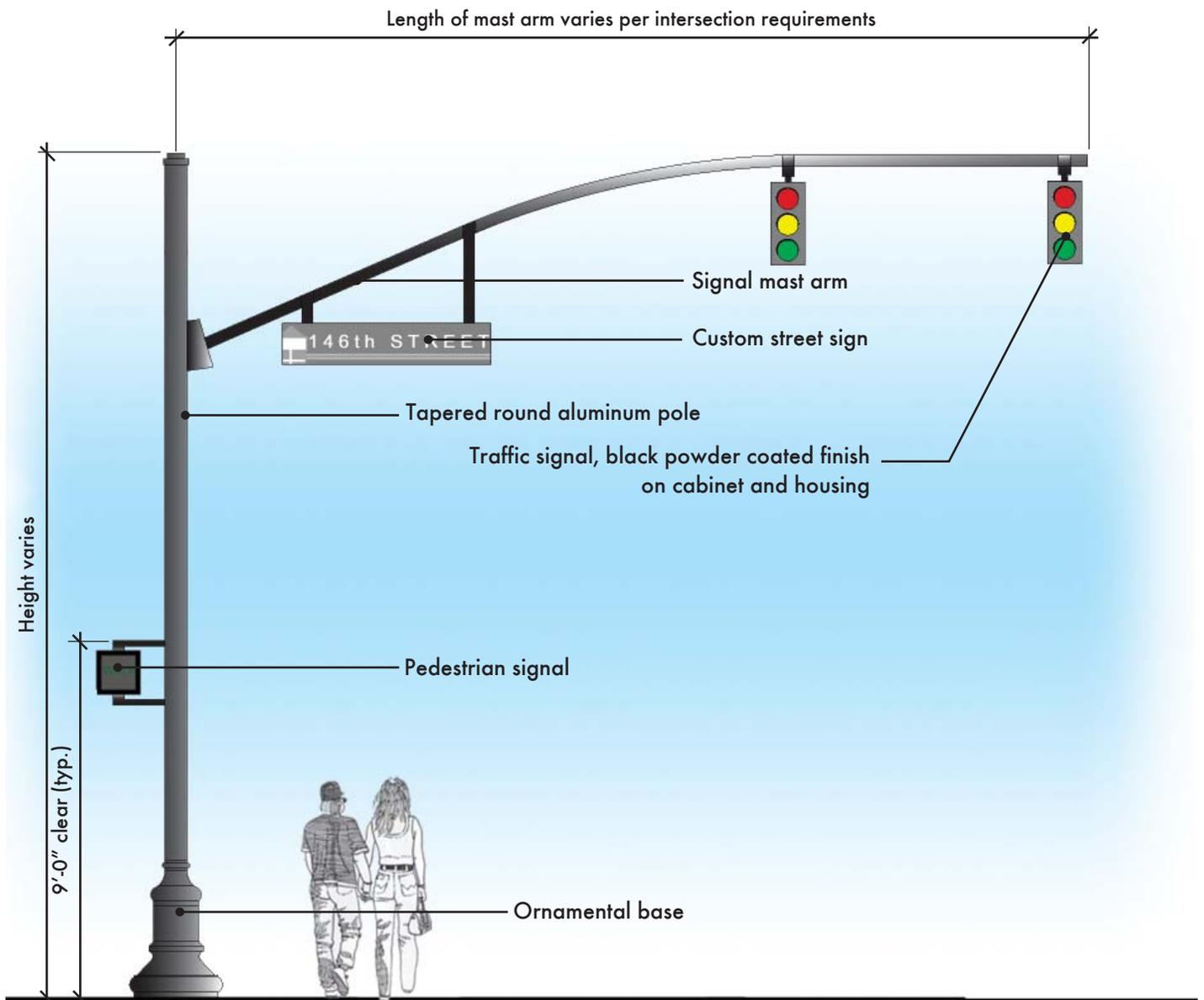


Figure 2-32: Typical elevation of the contemporary traffic signal pole selected for the intersections in Westfield. The pole complements the ornamental light pole and fixture used elsewhere.

SPECIAL ENHANCEMENTS

The following are special corridor enhancements and are applications that go beyond the typical roadway treatments. These enhancements provide unique treatments to specific spaces along the corridor. These enhancements reinforce the character, create added interest at specific locations and serve very specific functions along the corridor.

TYPICAL INTERSECTION ENHANCEMENTS

Throughout the corridor system in Westfield there are three types of intersections; signalized, non-signalized and roundabouts. Each type of intersection should be treated differently to provide a varying level of awareness along the corridor.

Primary Intersections

Primary intersections are those that are signalized. These intersections typically have heavy traffic counts in both the north/south and east/west directions. These intersections need to be enhanced further for the safety of pedestrians and vehicular traffic. The primary intersections along both corridors feature wider paved pedestrian crosswalks, ornamental signal poles and arms, vehicular wayfinding signs and enhanced ornamental vegetation. The intersection consists of a simple material palette that includes concrete and brick pavers. Within the pedestrian crosswalks, heavy duty concrete pavement is lined with a row of brick pavers. The bricks will be shades of brown which will blend well with the concrete color. At the corners, concrete pavement is visually broken up by the brick paver bands running through the area. These brick paver bands allow for a continuity of materials between the gateway lanterns discussed later in this section, and the crosswalk pavement. Each primary intersection is also highlighted by ornamental plantings behind the pedestrian node. These plantings consist of ornamental trees and low growing shrubs, grasses and perennials. The plantings, along with the wider pedestrian crosswalk also provide a visual cue to pedestrians and vehicular traffic that they are approaching a critical interface point and greater caution is warranted. Figures 2-32 and 2-33 illustrates the typical treatment at signalized intersections.

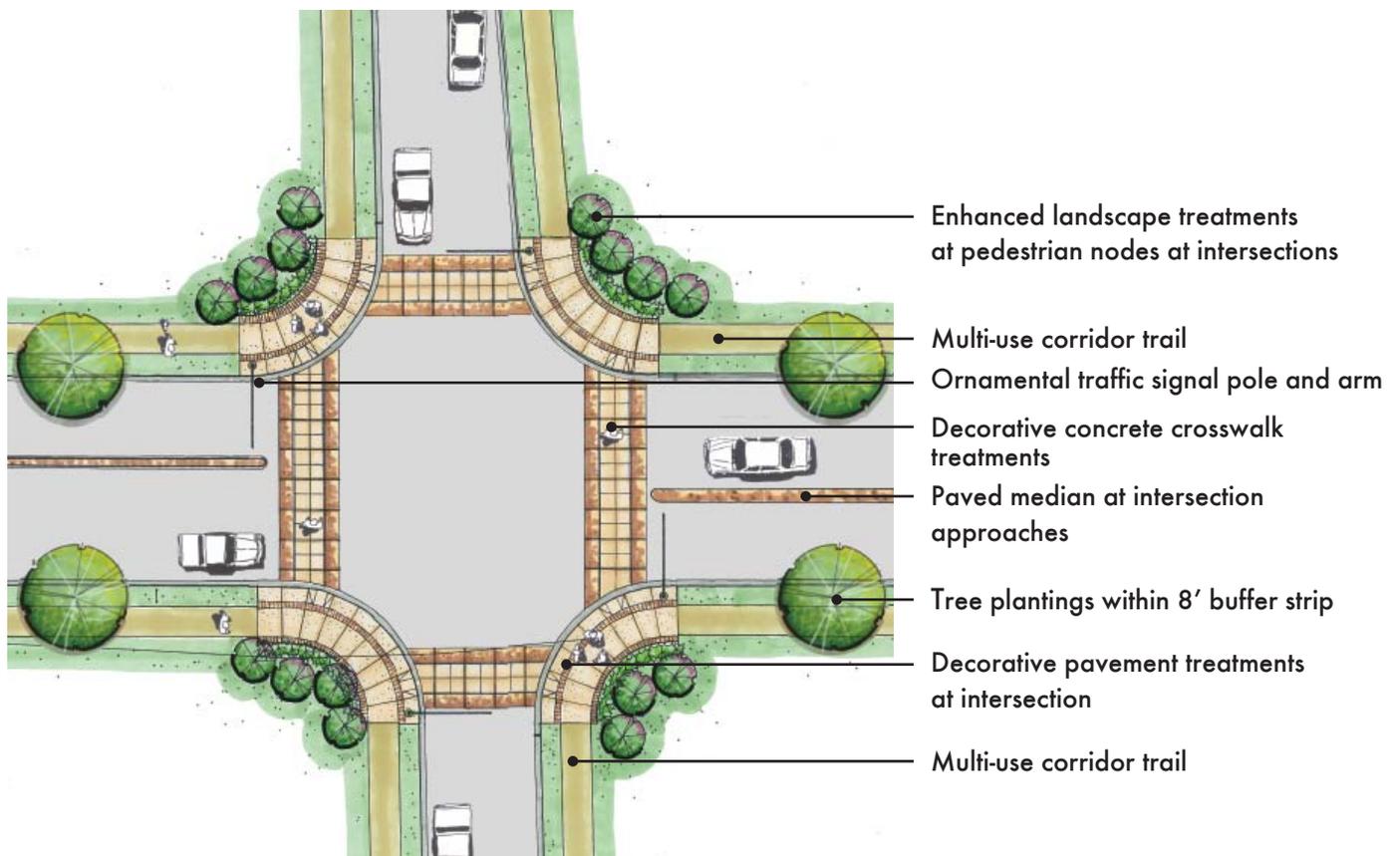


Figure 2-32: Typical plan illustrating primary intersection treatments with concrete and colored brick pavers crosswalks and additional plantings.

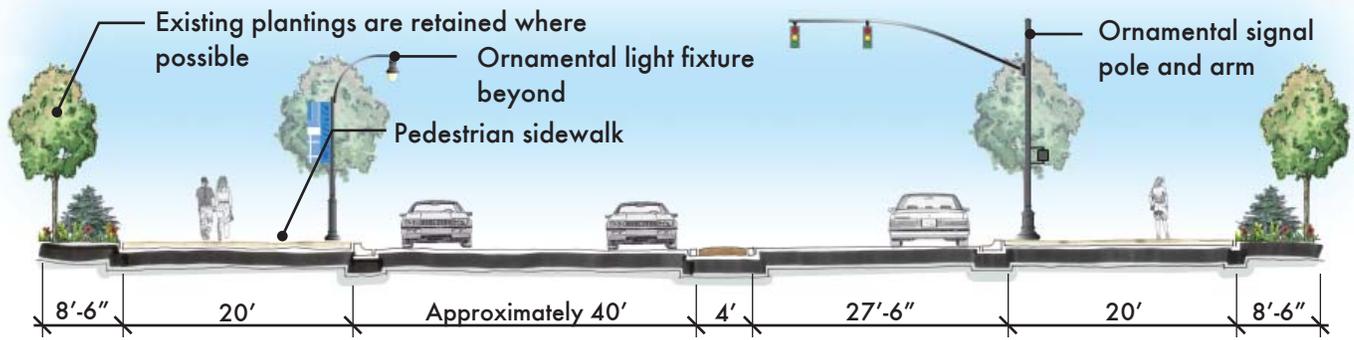


Figure 2-33: Typical cross-section near primary intersections illustrating decorative signal poles, ornamental lights and a tapered median constructed of colored pavers.

Secondary Intersections

For purposes of this study, secondary intersections are those that are not signalized, but do contain traffic control devices. These intersections have lower traffic counts in both the north/south and east/west directions. Although these intersections need to be enhanced to ensure pedestrian and vehicular safety, the level of treatment identified are different than the primary intersections. The secondary intersections along the corridors feature wider pedestrian crosswalks, ornamental signal poles and arms and vehicular wayfinding signs. The pedestrian crosswalks will be constructed of striped thermoplastic white lines in order to draw driver's attention to the crosswalk. At the corners, concrete pavement is used throughout the pedestrian node area. Each secondary intersection is also highlighted by ornamental tree plantings behind the pedestrian node. Secondary intersection treatments are illustrated in Figures 2-34 and 2-35.

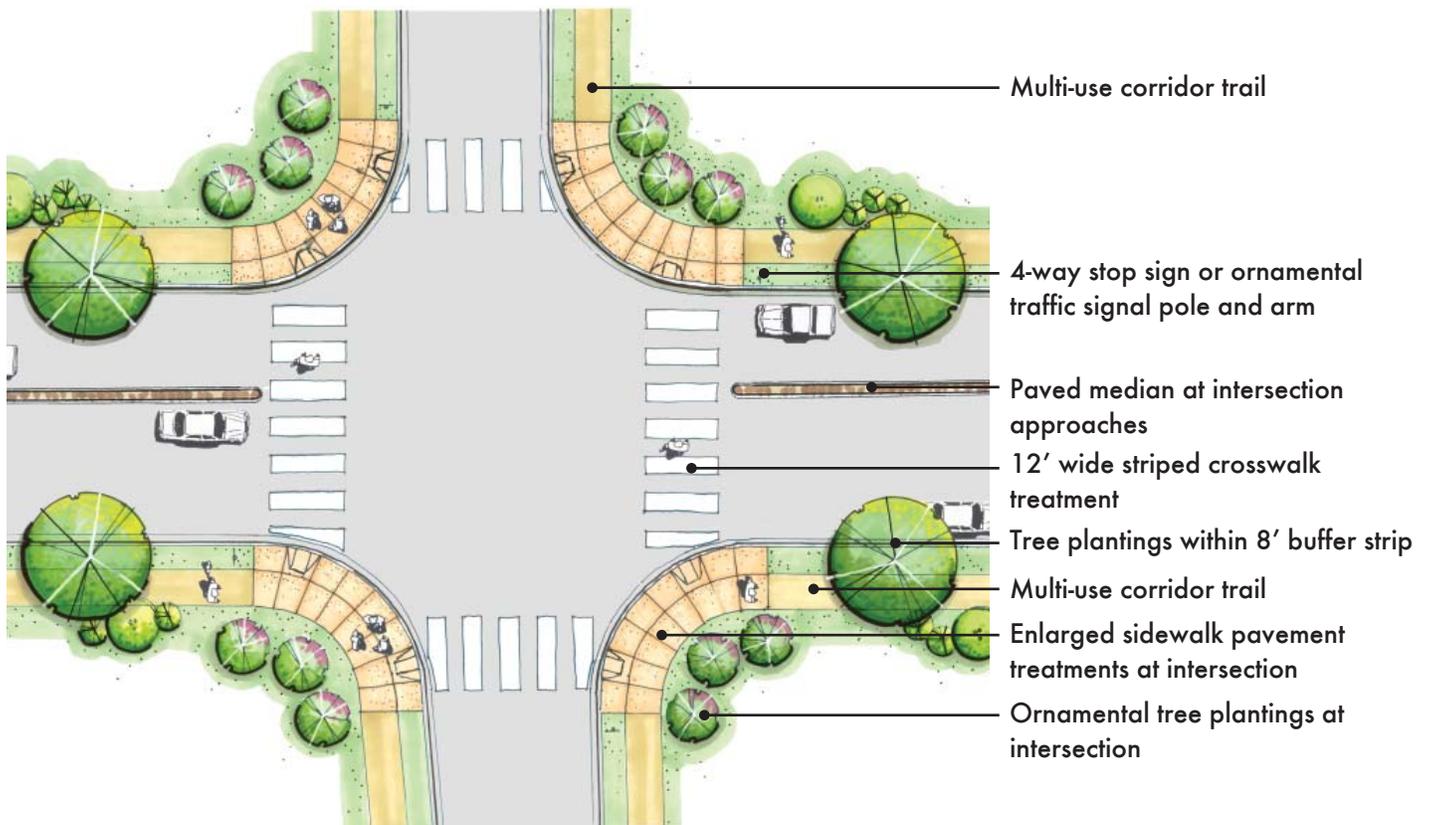


Figure 2-34: Typical plan illustrated intersection treatments at secondary intersections. Secondary intersections provide additional pedestrian at all corners while utilizing a minimal crosswalk treatment.

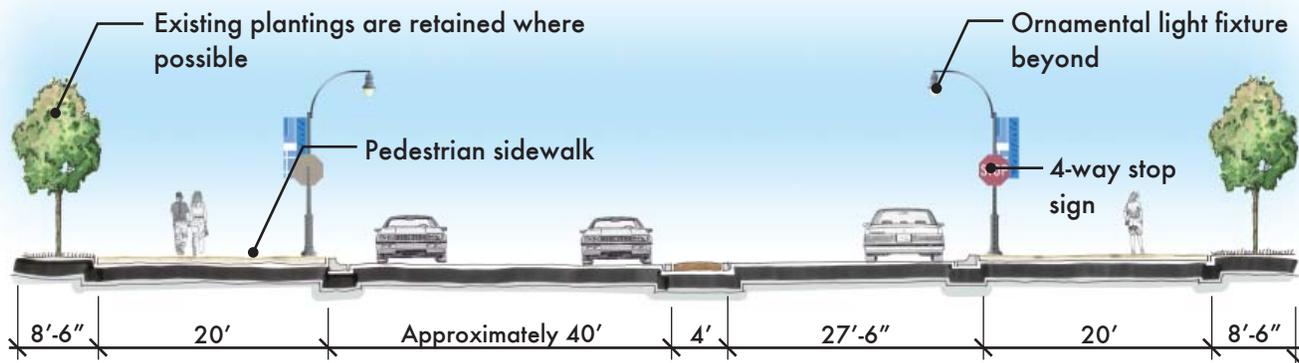


Figure 2-35: Secondary intersections use four way stop signs, and accommodate a tapered median constructed of colored pavers.

Typical Roundabout Treatments

Roundabouts are typically used to ease traffic flow and congestion. While specific sites have not been chosen, roundabouts are a feasible intersection alternative for the Town of Westfield. At future round about locations, similar materials and treatments will be used to provide a continuous design aesthetic for all corridors. Concrete pavement and brick paver bands will be used at the intersections to provide enlarged pedestrian areas of refuge. Concrete and pavers will also be used in the widened pedestrian cross walks to accommodate pedestrian traffic.

Median plantings are incorporated in two different ways. Ornamental trees spaced in irregular groves of three to four trees along with native shrubs and perennials will be used in the approach to the roundabout, while masses of shrubs and perennials will be used at the termination of the median. The center of the roundabout will be planted with evergreen shrubs, ornamental grasses and native perennials. The planting choices will also provide seasonal interest and will visually compliment the gateway lantern that is proposed for the center. The center island also features a mountable curb and additional pavement to protect the landscaped area.

The gateway lantern reinforces the presence of the roundabout and provides a vertical cue that traffic must move around the center island, and further reinforces the visual identity of the corridor. The gateway lantern island is unique to Westfield and creates a signature design element that sets the roadway apart from those in neighboring communities. Additional ornamental trees are not proposed for the roundabout intersections to ensure safe sight distances. Existing vegetation will also be removed as needed outside of the pedestrian sidewalk to ensure appropriate sight distances are met in the area. Roundabout intersection treatments are illustrated in Figures 2-36 and 2-37.

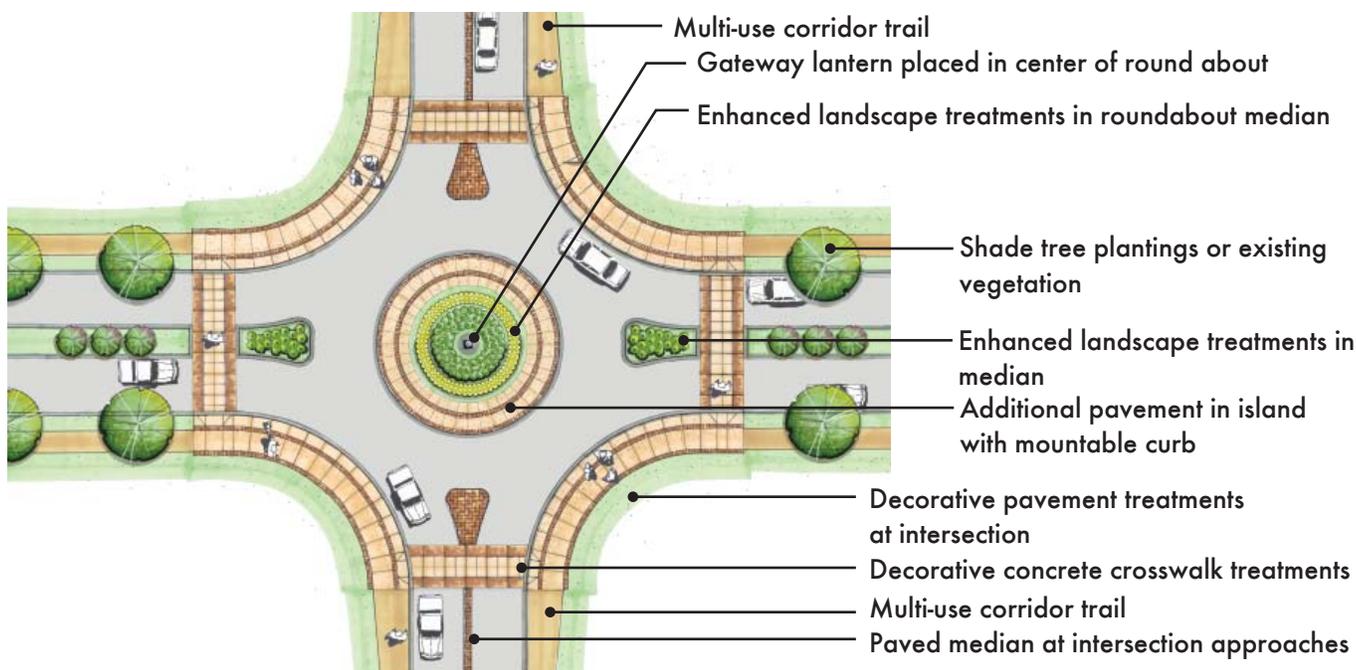


Figure 2-36: Typical plan of roundabout intersection treatments. Roundabout intersections will include similar crosswalk treatments as the primary intersections along the corridor.

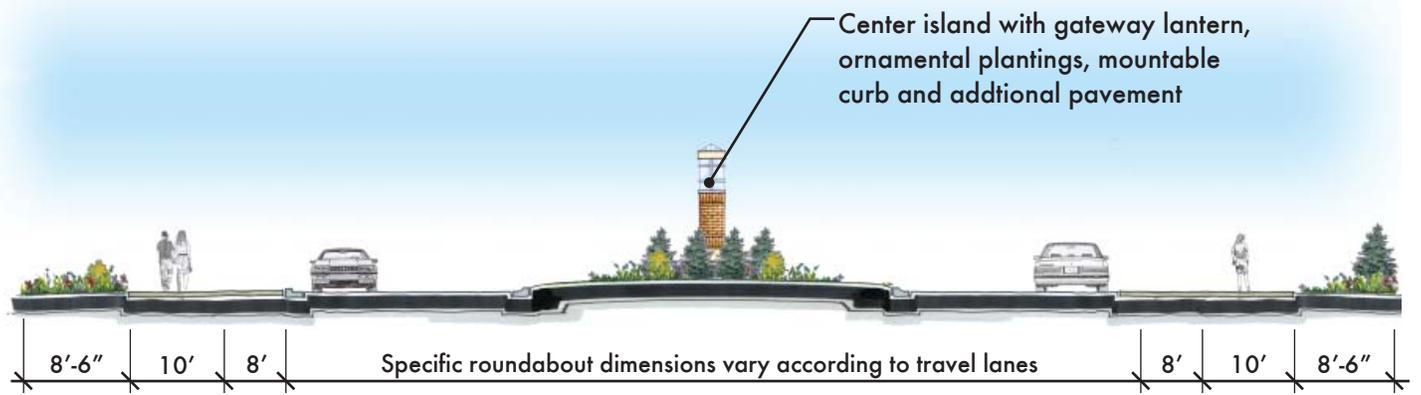


Figure 2-37: Typical cross-section of roundabout treatments. Roundabout intersections feature similar pavement treatments as primary intersections to continue the design theme.

CORRIDOR GATEWAY TREATMENTS

The Gateway Lantern

Gateway monuments have been developed as signature design elements for the corridors. As one of the single most important features for creating a memorable impression for those who travel its path, gateway features will set the corridors apart from others in neighboring communities. The gateway lanterns are used to create a unifying theme for the corridors as well as the entire community. Currently the Town of Westfield is installing a city gateway at the intersection of SR 32 and Gray Road, which will be constructed of brick and limestone and incorporates the lantern symbology. The same materials and shapes were used when designing the gateway lanterns for the corridors master plan. Like other major design enhancements, the symbols were abstracted creating a very contemporary design that is still suggestive of its historic and cultural roots. The intent is not that these lanterns become the official gateway for the community, but that they provide one more repeated icon that connects to the new overall identity being created for Westfield.

The lantern structure consists of a two foot limestone base, and a ten foot brick column. The brick column showcases both running bond and soldier coarse patterns that mimic the community gateway currently being constructed. At the top of the lantern, a three foot section of paned glass allows the lantern to cast a subtle glow. The top of the lantern is a metal panel. While the lantern will cast a subtle glow, it is not intended to provide adequate light for the roadway or the pedestrian nodes. Because of these specifications, the lantern will not cast unneeded light to areas developments or residential areas. The gateway lantern can be seen in Figure 2-38.

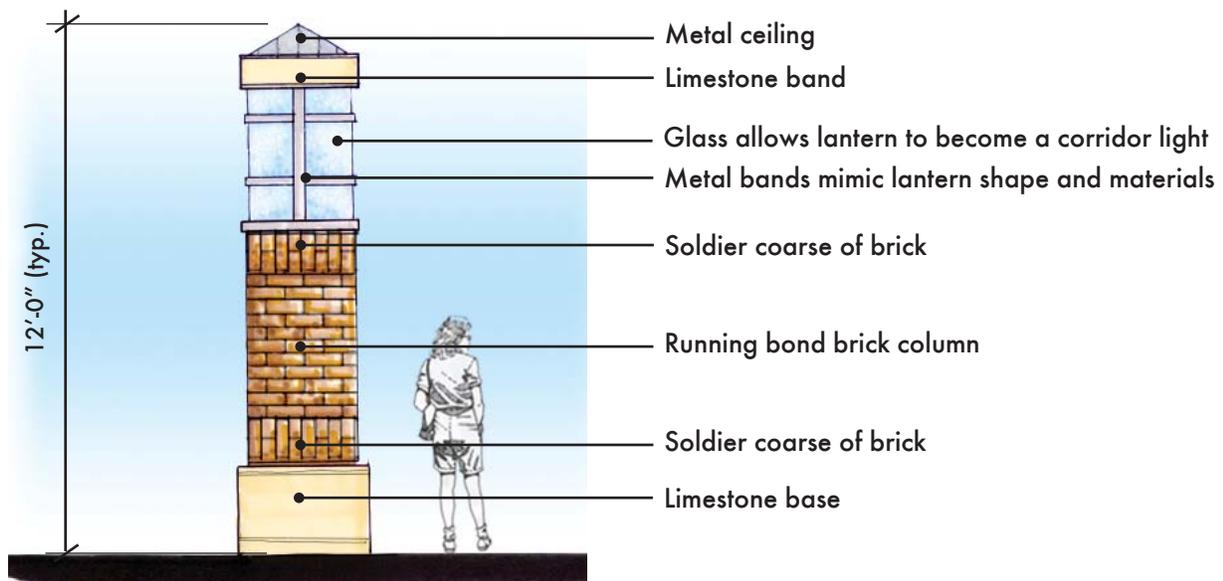


Figure 2-38: Typical elevation of the gateway lanterns- a modern interpretation on a lantern which has become a symbol for the Town.

Gateway Intersections

At key intersections a gateway lantern will sit on opposite corners and will become a beacon for the pedestrian node at those intersections. The gateway lantern will also be used to announce key structures and land uses, such as schools or parks, along the corridor. Specific locations will need to be identified for each corridor. At these locations the lanterns will be placed on either side of the corridor as well as in the raised median. Typical intersection placement is illustrated in Figures 2-39 and 2-40.

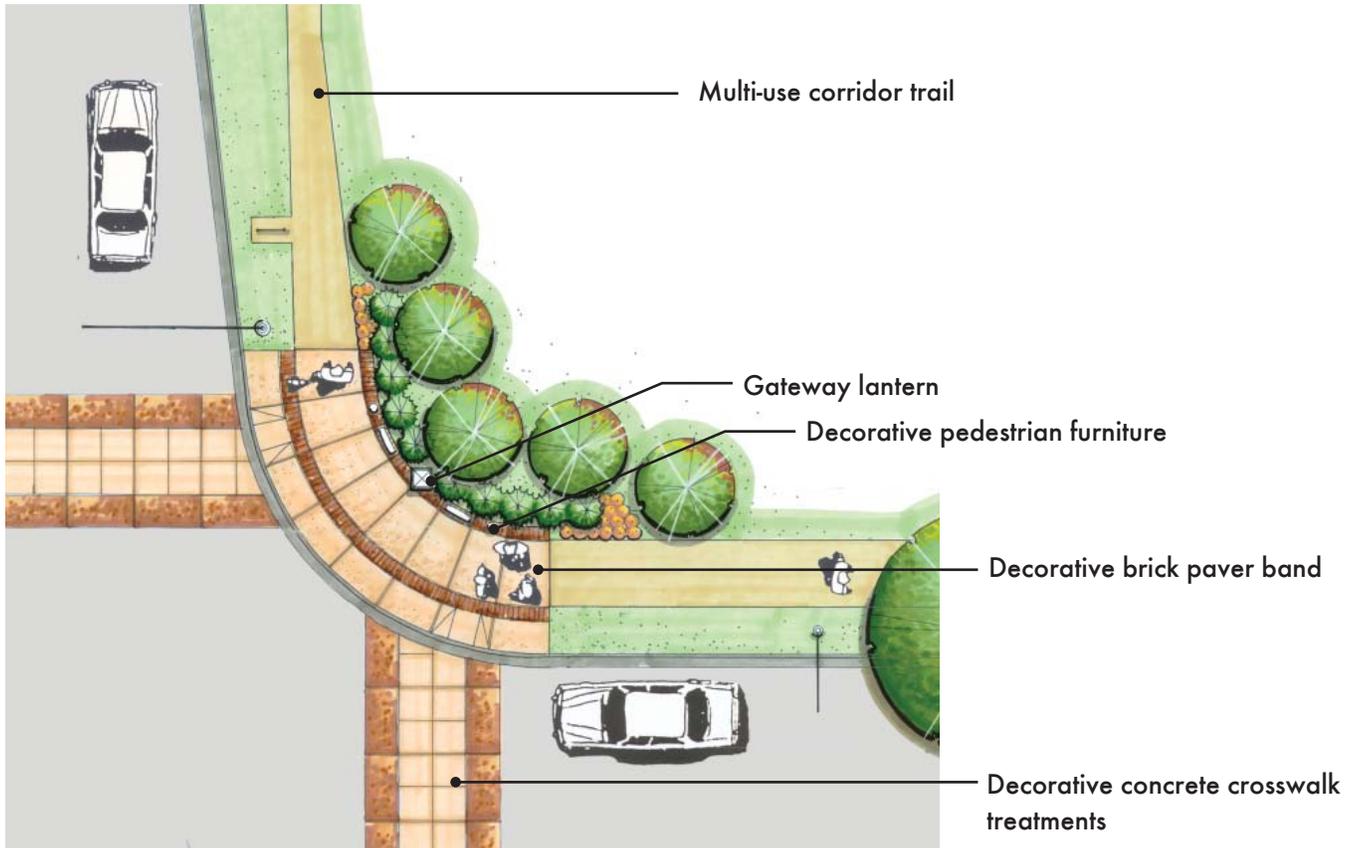


Figure 2-39: Enlarged plan of pedestrian node at a typical primary intersection illustrating the typical placement of the proposed gateway lanterns. Gateway lanterns occur at specific locations and act as a complement to the town gateway at SR 32 and Gray Road.

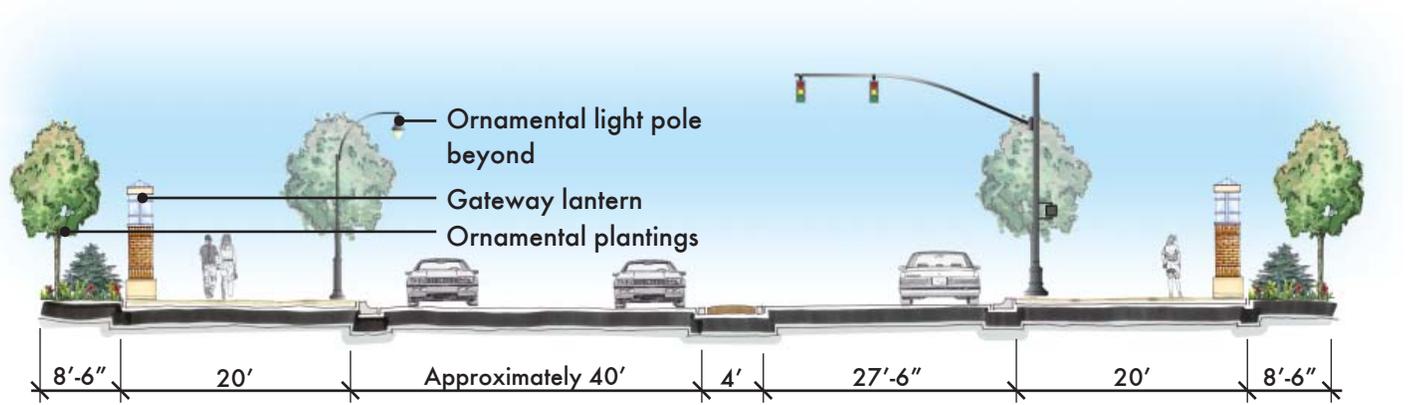


Figure 2-40: Typical cross-section illustrating the application of gateway lanterns at primary intersections. The gateway lanterns are used to further announce the intersections and provide a front door to specific communities within the town.

CORRIDOR SIGNAGE AND GRAPHIC IDENTIFIERS

Wayfinding signage along with other graphic identifiers will aid in creating a seamless aesthetic identity to the town of Westfield. Vehicular and pedestrian traffic will look to both street and directional signage for information on community destinations and addresses. By providing a continuous design for this signage system, the corridor enhancements will be further reinforced as one design vocabulary associated with the town.

Wayfinding Signage System

The final component of the enhancement plan was the creation of wayfinding signage concepts. Wayfinding signage is an important streetscape amenity that serves as an information tool and a unifying element. Wayfinding signs allow corridor users to clearly find attractions and destinations with minimal confusion. The wayfinding system developed for the corridors relies on directional information and graphics to present a hierarchy of information and to highlight the special attributes of the corridors and the community.

The system is comprised of freestanding vehicular and pedestrian directional wayfinding signs, and pole mounted ornamental street signs. Not only do the wayfinding signs and street signs enhance the image of the corridors as a destination, but they help to organize its destinations and attractions by providing people with directional information for local facilities and attractions. The wayfinding signs developed for the Westfield corridors play a critical role in making a strong and memorable impression to all who travel the corridor. The wayfinding signs are simple in their design and consist of a large sign panel with local destinations and large block arrows. Atop the sign panel is an area for a district or town logo. Vehicular and pedestrian wayfinding sign concepts, and their respective locations are illustrated in Figure 2-41 and 2-42.

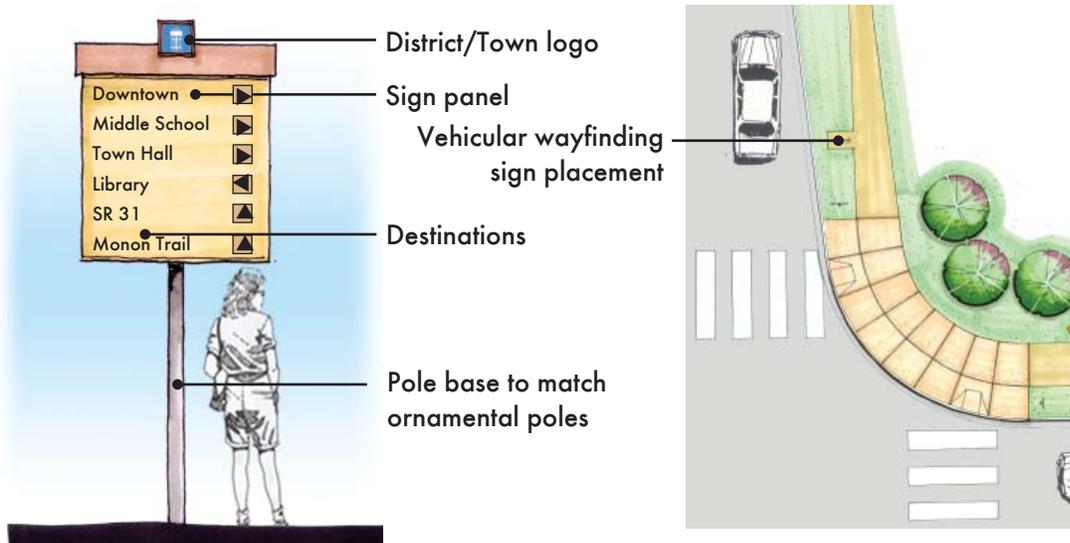


Figure 2-41: Elevation and typical plan illustrating vehicular wayfinding signage and typical placement.

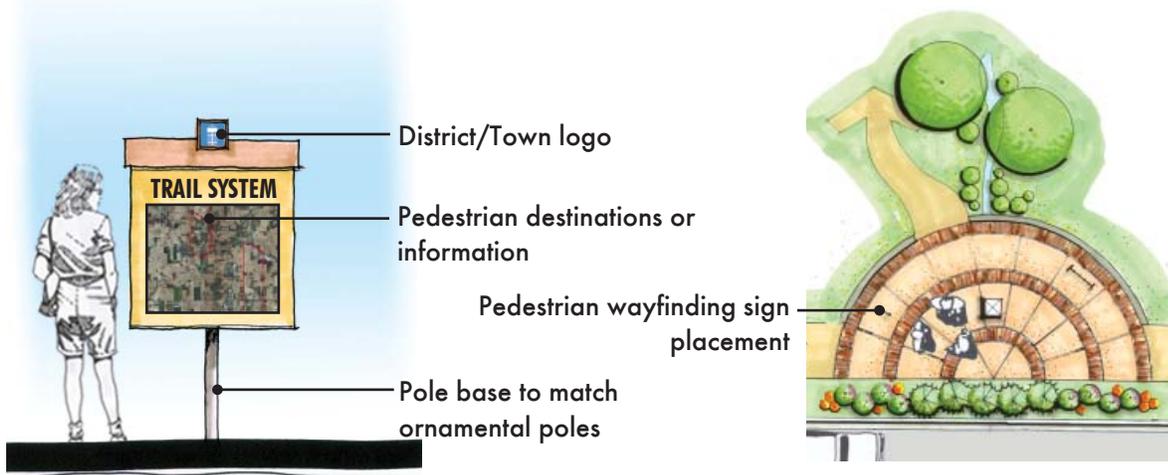


Figure 2-42: Elevation and typical plan illustrating pedestrian wayfinding signage and typical placement.

The wayfinding system is designed to assist corridor users in finding their way to key community destinations. As a public system, using public dollars and constructed in the public rights-of way, it is important that the system is used for public facilities and destinations, and not for the advertisement of private businesses and interests. As such, stringent guidelines should be developed that identify acceptable destinations to be included on the public wayfinding signs. Recommended guidelines should include:

- ◆ All destinations should be public-owned facilities. These may include public buildings, schools, parks, trail systems, streets, roads, or other facilities that are community property.
- ◆ All destinations should be within the Town of Westfield. Specific criteria for significant destinations used by Westfield residents outside of Westfield should be developed before allowing destinations.
- ◆ Regional destinations, such as neighboring communities, may be included in the system.

General guidelines for the placement of wayfinding signs:

- ◆ For vehicular signage, signs should be placed in advance of critical decision-making points on the corridor, allowing drivers sufficient time to view the signs and make turning decisions based upon the sign.
- ◆ Text and directional arrows should be of sufficient scale and color to be readable from the street. White lettering on a dark background is recommended.
- ◆ Signs should be kept free of landscaped areas and other visual obstructions.
- ◆ Wayfinding signs and posts should adhere to required setbacks and clear distances along all roadways.

Additional Corridor Signage

The ornamental street signs proposed for the corridor are simple black and white panel signs, but are embellished with an abstract lantern logo. This small design detail will further connect the corridor enhancements together into one family of aesthetic treatments. Ornamental street sign panels are shown in Figure 2-43.

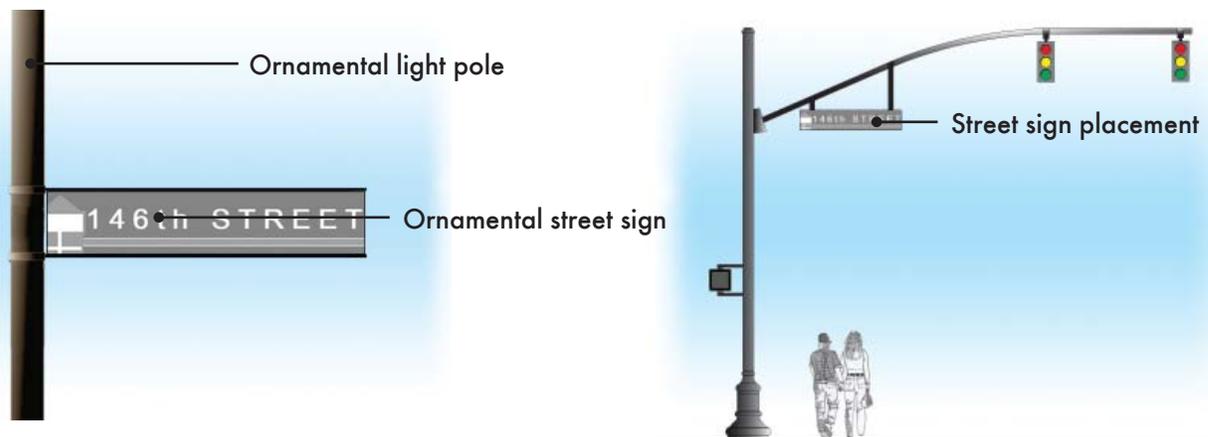


Figure 2-43: Elevations of proposed street signage and typical placement on decorative signal poles. Street signs are a small detail that helps unify the corridor design theme.

Banners

In addition to wayfinding signs and ornamental street signs, banners have also been proposed for the corridors. These banners, which are attached to the ornamental light poles, further enhance the look and feel of the corridors. While the illustration on the banner shown is general in nature, custom themed banners can be changed according to event or season. A typical banner design is illustrated in Figure 2-44.

A successful banner program is dependent on the administration of the program. By putting a banner program in place, the community will gain a sense of pride, beautification and it will promote community activities and programs important to the Town's image, economic interests and organizations serving the community. The program can encompass all of the poles within the Town limits. Typical banner programs set both a minimum and maximum number of banner poles to be used during a set program, and also require set costs, design requirements, banner construction specifications and display lengths. This will ensure a continuous design aesthetic to the ever-changing banner.

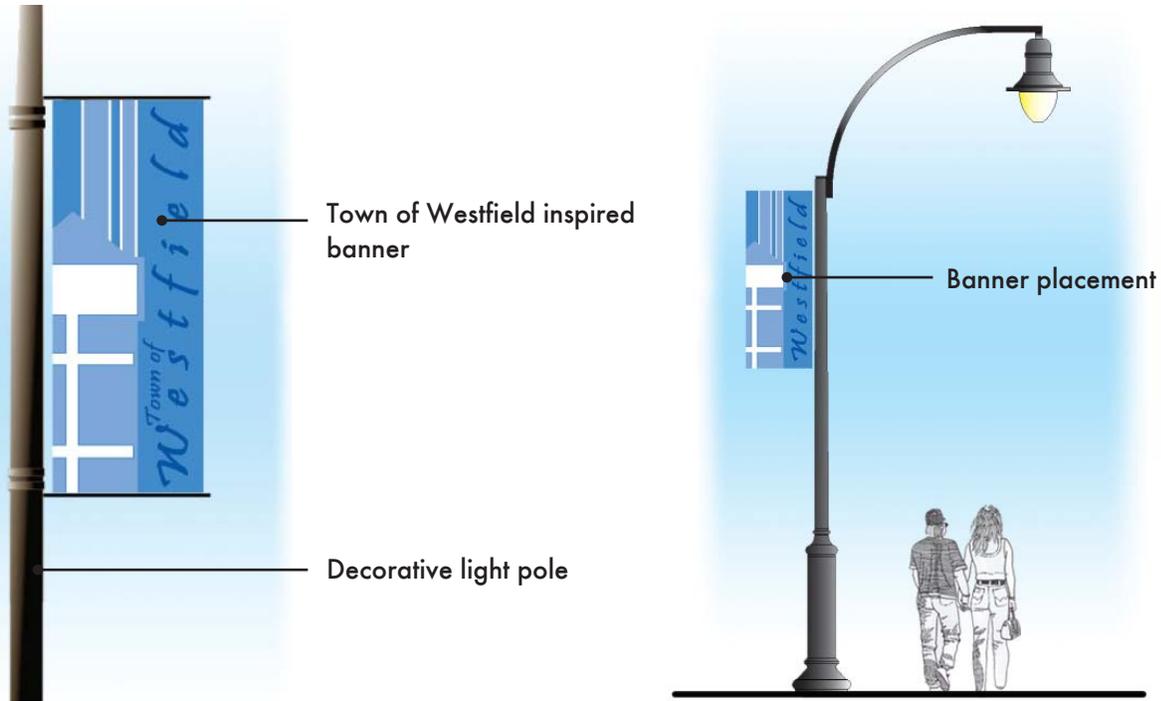


Figure 2-44: Elevations of custom banners and typical placement on decorative poles. Banners can be general community identifiers or be designed to celebrate specific occasions within the town and can be changed easily.



Figure 2-45: Pedestrian and bicycle amenities include benches and trash receptacles manufactured by Landscapeforms.

PEDESTRIAN AND BICYCLE AMENITIES

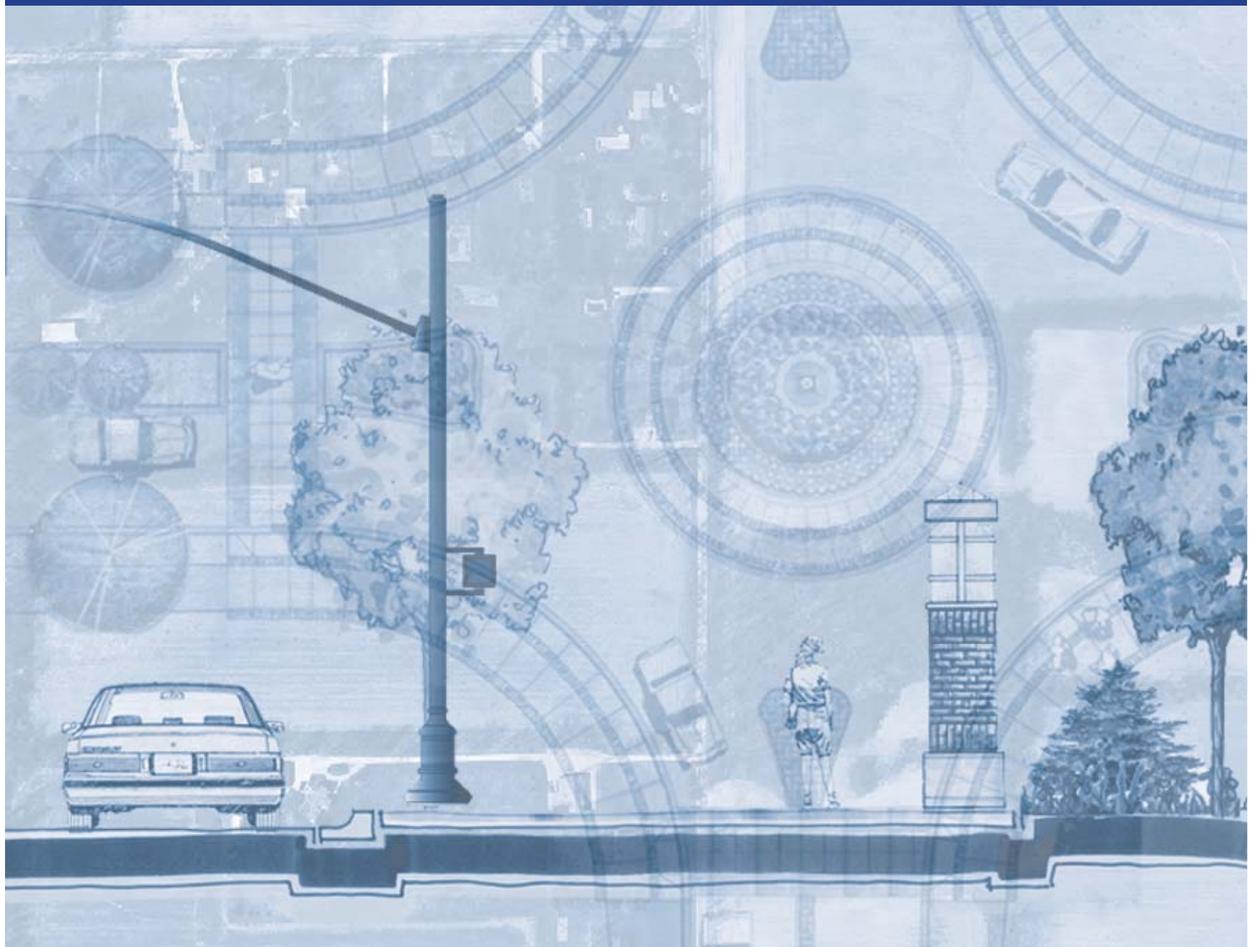
A palette of pedestrian amenities has been selected for the gateway intersections, as well as the trail nodes along the corridors. All benches, trash receptacles and bike racks in the study area fronting the corridor should utilize the same furniture piece or family. When selecting a furniture group, pedestrian amenities should be chosen from a single product line in order to streamline the selection and ordering process during the corridor construction. The use of pre-manufactured design amenities ensures the availability and quality of all components. Furthermore the utilization of a single product line guarantees a uniform color, finish, and design aesthetic for all amenities without any question of consistency. All pedestrian amenities are to be powder coated black with a rust-proof finish. All pedestrian amenities were chosen based on having a contemporary design so that they mimic the historic forms throughout the town. Chosen pedestrian fixtures are shown in Figure 2-45. Pedestrian furniture is manufactured by Landscapeforms, and includes the Scarborough bench and trash receptable.

CONCLUSION

The enhancement portion of the project is intended to establish a long-range vision for how corridor enhancements can be used to create a uniform character for the community and further define the access management mechanisms for all corridors in Westfield. While the enhancements and recommendations listed in this section represent the complete vision of all corridors within the town, specific applications of these enhancements are illustrated in Section 4. The enhancement recommendations presented here are intended to be applied throughout the course of each corridor's development.

3

ACCESS MANAGEMENT



3

ACCESS MANAGEMENT



INTRODUCTION

Access management involves the implementation and control of roadway design elements in order to allow safe and efficient access to property while preserving the traffic movement function of the transportation system.

Access management is the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway. It also involves roadway design applications, such as median treatments and auxiliary lanes, and the appropriate spacing of traffic signals. Transportation Research Board Access Management Manual (2003, p. 3)

Proper access management can preserve the efficiency of a corridor, reduce congestion, minimize crashes and provide for more aesthetic pedestrian and landscaped areas. By incorporating access management recommendations into the corridors master plan, roadways can be designed to not only optimize the function of each corridor, but to also promote safe and efficient access to destinations within Westfield.

PURPOSE

Access management plays a critical role in the establishment of a well-functioning roadway, and is especially important when constructing new roads. The implementation of access management recommendations for roadway corridors in Westfield will help to ensure that the town's roadways function at optimal levels.

Access management involves the physical layout, operations and institutional control of a roadway. This study is a proactive approach of incorporating access management concepts into the master planning process for Westfield's arterial roadway corridors.

ROADWAY FUNCTIONAL CLASSIFICATION

All roads are designed to balance two primary functions: carrying through traffic and providing access to adjacent property. The functional classification of a roadway helps to describe the intended balance of these two functions. Roadways that are primarily intended for through traffic service (typically for longer trips) are referred to as arterials. Those intended primarily for access to abutting land use are local streets. Collector roadways link local streets with arterials and often serve balanced demands for travel and access to property.

In many ways, the functional classification system for a network of roadways is analogous to a tree, with the arterials serving as the trunk, the collectors serving as the branches, and local streets serving as the twigs that tie directly with the leaves (representing individual land parcels). Functional classification should be defined in the context of the overall roadway network to provide a balanced system that meets both travel and access requirements. The functional classification of a road guides decisions including lane requirements, appropriate design standards, cross section elements, appropriate rights of way, and access management components.

Although several classifications of roadways currently exist in the town, the recommendations in this report are designed to apply to all arterial corridors. Figure 3-1 illustrates information that was gathered and presented to the steering committee in regards to roadway needs and classifications. For information on the current roadway classifications and their locations, refer to the Westfield Thoroughfare Plan.

Access management is most successful when it can be incorporated into the design of a roadway system from the beginning. Unfortunately, that is not always the case. In fact, access management is often considered only when problems occur on an existing roadway. By that time, existing conditions typically make it difficult to implement some of the most effective strategies. By including these access management recommendations in the design of new arterials, future safety and operational problems can be avoided before they occur.

ACCESS MANAGEMENT OBJECTIVES

The access management plan for Westfield reinforces the intended function of the corridors, but it also provides some flexibility in recognition of existing development and access patterns along each corridor. The overall goal of the plan is to preserve the safe and efficient operation of the roadways while continuing to support access and connectivity to the existing and proposed uses in the corridor system. Specific access management objectives for Westfield include:

- ◆ Establish roadway design parameters that meet the community's traffic needs for each corridor;
- ◆ Establish the appropriate level of movement and access;
- ◆ Develop standards for the number and appropriate location for access points to each corridor;
- ◆ Identify additional strategies that optimize the movement of vehicles and people through the corridor.

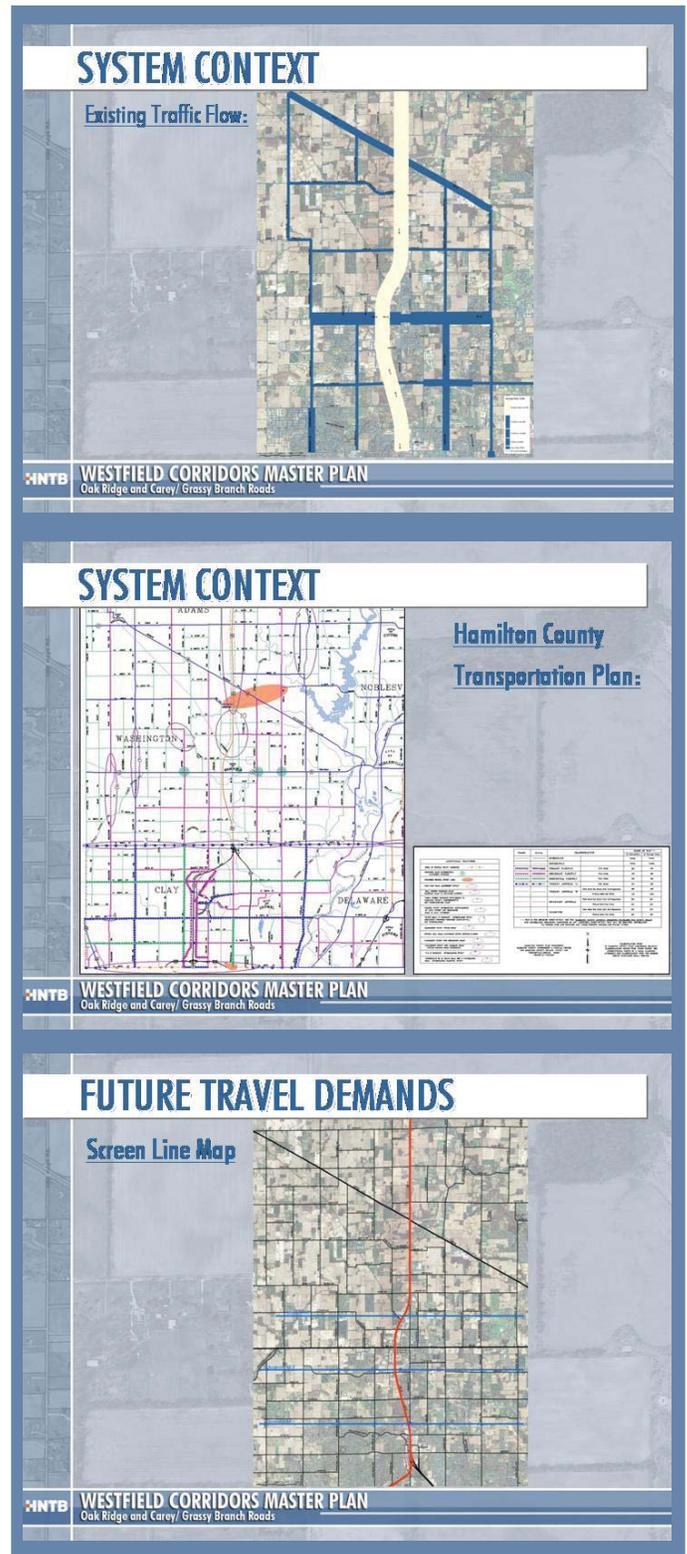


Figure 3-1: Images from the third Steering Committee meeting discuss existing roadway corridors and future needs.

ELEMENTS OF THE ACCESS MANAGEMENT PLAN

Access management will be accomplished in each Westfield corridor by controlling key elements in the design of the street and its access. Specific locations for these design elements are discussed in the section four of this report.

Raised Medians

Raised Medians provide several positive traffic flow, safety and aesthetic benefits. They physically separate opposing traffic streams, and they limit the turn locations where conflicting movements can be made across those main traffic streams. Raised medians, illustrated in Figure 3-2, provide a location for the deceleration and storage of left turning vehicles that removes them from the through traffic stream. They provide a refuge for pedestrians crossing the street, and they provide a location for aesthetic enhancements along the street. Raised medians are recommended on all of Westfield's primary arterial and secondary arterial streets. In areas of existing development, the placement of raised medians should include consideration of their impact on access to existing properties.

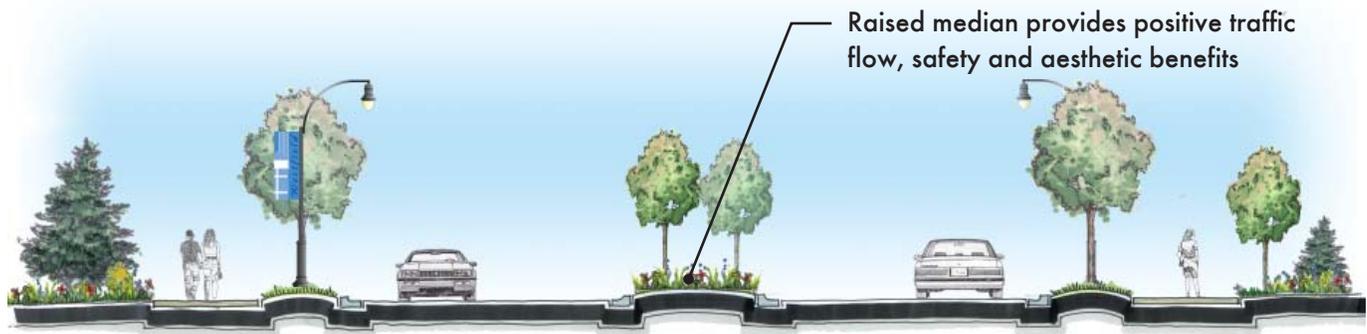


Figure 3-2: Typical corridor cross section utilizing raised medians to promote access management.

Continuous Two-Way Left Turn Lanes

Continuous Two-Way Left Turn Lanes (TWLTL) also provide traffic flow and safety benefits compared to roadways with no median. Like raised medians, these lanes provide a location for left turning vehicles to decelerate and maneuver separate from the through traffic stream. TWLTL, illustrated in Figure 3-3, do not provide the same traffic operations benefits that raised medians provide, and they do not discourage strip development with closely spaced driveways. Nor do they provide areas for pedestrian refuge or aesthetic treatments. However, a TWLTL is an appropriate method of improving traffic flow and traffic safety in areas where numerous existing driveways must be maintained. Although the parkway guidelines do not incorporate two way left turn lanes, this element could be appropriate in areas with numerous existing drives and limited right-of-way. In areas along the corridors where existing development and curbs cuts make the construction of a raised median impossible, a two way left turn lane can be used to provide an efficient means of control for turning movements.

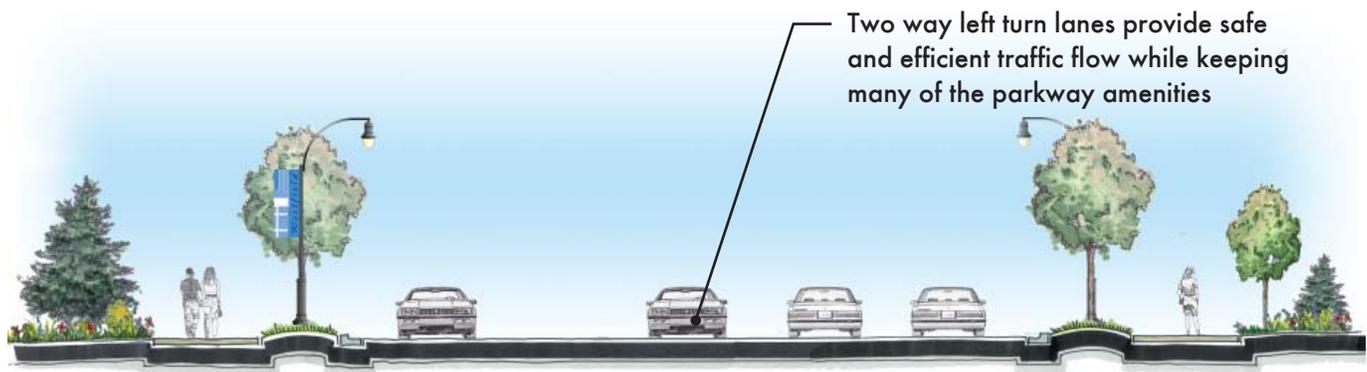


Figure 3-3: Typical corridor cross section utilizing two-way left turn lanes to promote access management.

Traffic Signal Spacing

Signalized intersections often determine the level of service and quality of overall roadway operations. Signals are often the most capacity constrained points on a road, and where intersections are spaced a mile apart or less, roadway capacity is directly related to how well the traffic signals operate as a system.

The coordination of adjacent traffic signals is straightforward in concept. Timing patterns are developed to provide progression through successive traffic signals for vehicles traveling at the appropriate travel speed. The coordination of traffic signals can be fairly easy on a one-way street, but becomes more complex for two-way operations since the optimal pattern in one direction may not work in the other direction. Two-way progression is much more effective where signalized intersections are evenly spaced at desirable intervals. In fact, irregular spacing of intersections can make two-way progression mathematically impossible. For that reason, identifying major intersections or access points to optimize traffic signal operations is one of the most important access management strategies for arterial roadways.

It is recommended that signalized intersections, illustrated in Figure 3-4, along arterial corridors be spaced approximately 1/2 mile apart.

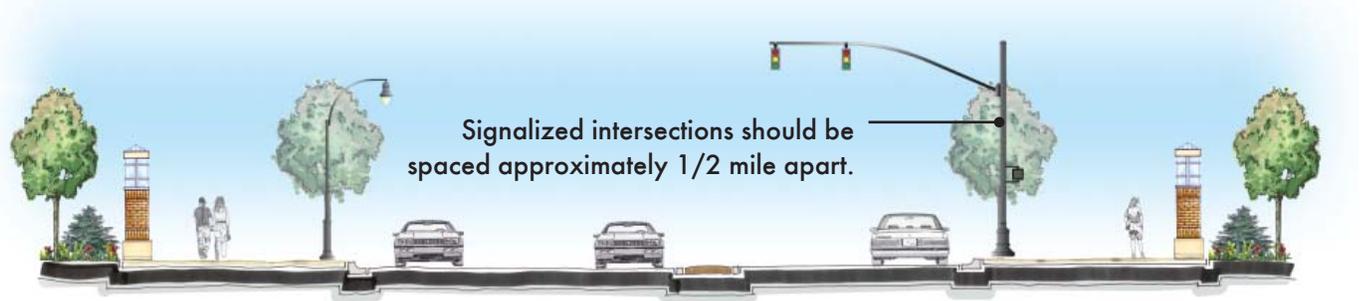


Figure 3-4: Typical corridor cross section utilizing signalized intersections to promote access management.

Unsignalized Access Spacing

In order to maintain the integrity of overall operations on Westfield's corridors, unsignalized intersections, illustrated in Figure 3-5, should be permitted only where they allow for satisfactory two-way traffic progression. If other access points are allowed, they should not be signalized and should not allow crossing of the median. Although some access points will not require signalization when constructed, it would be prudent to assume that any access point with a median cut might someday be signalized and treat each request for access accordingly. The following guidelines are recommended for the spacing of unsignalized access along arterial corridors:

Access Spacing Guidelines (in Feet)		
	Primary Arterial	Secondary Arterial
Full Median Opening	2,640	1,320
Access in areas without median	2,640	660
Right in, Right out access in median area	1,320	330

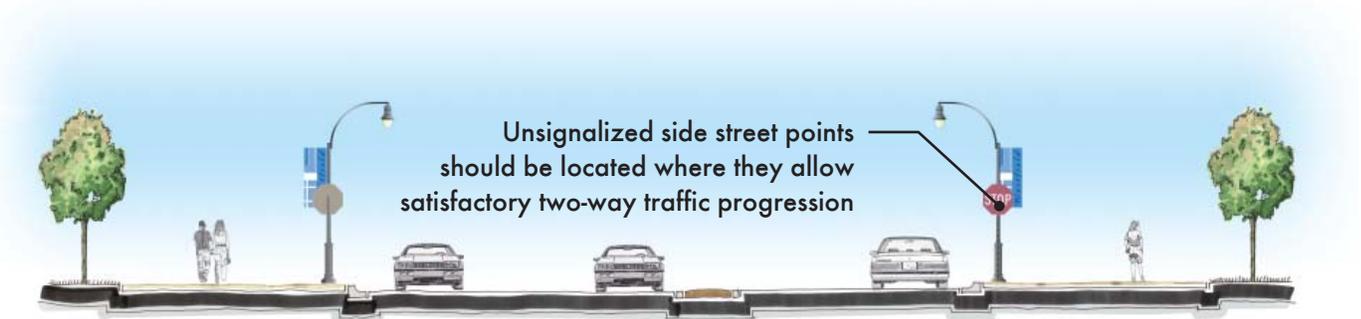


Figure 3-5: Typical corridor cross section utilizing unsignalized intersections to promote access management.

Roundabout Intersections

A roundabout intersection, illustrated in Figure 3-6 acts very similar to a signalized intersection. Existing and future intersections could be better served by a roundabout, which efficiently slows and controls traffic without using a typical traffic signal. Spacing of roundabouts should follow the same guidelines as signalized intersections.

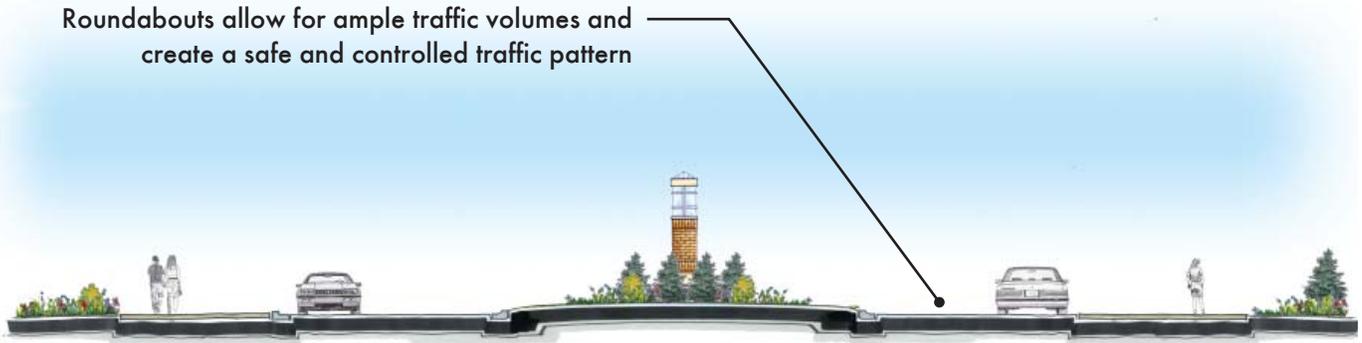


Figure 3-6: Typical corridor cross section utilizing roundabout intersections to promote access management.

Auxiliary Lanes

Left and right turn lanes at intersections and driveways provide important safety and capacity benefits. These lanes allow vehicles to decelerate and queue for turning maneuvers outside of the through travel lanes. The use of auxiliary lanes are recommended for use in Westfield with lanes and lengths determined during the roadway engineering phase.

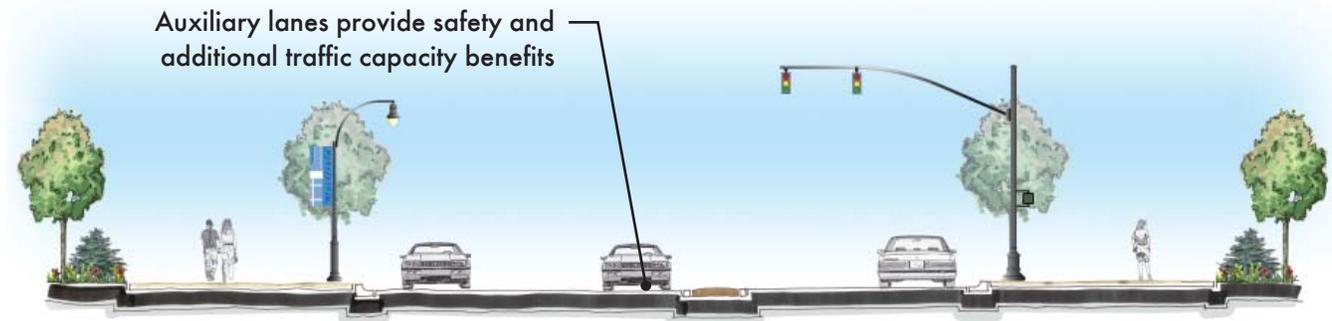


Figure 3-5: Typical corridor cross section utilizing auxiliary lanes to promote access management.

Driveway Design

Driveway design is important to the safe and efficient movement of vehicles to and from individual sites. All driveways along the primary and secondary arterials should be curbed, and curb radii and driveway widths should conform to Town standards. Adequate lighting should illuminate the entire driveway intersection so that drivers can determine the location and geometrics of the driveway. The length of a driveway throat on a property specifies the separation distance between the adjacent street and any on-site circulation roads. It is important that this throat length be sufficient to allow efficient circulation of site traffic and prevent queues of entering vehicles from spilling back onto the street. Driveway throat length should be at least 50 feet for any driveway. If a driveway is signalized, or if a development generates sufficient traffic to warrant a traffic impact study, driveway throat lengths should be sufficient to store any anticipated queues. The following table provides minimum geometric recommendations for driveway widths and curb radii.

Driveway Width and Curb Radius Requirements		
Driveway Type	Minimum Driveway Width	Minimum Curb Radii
Residential Driveway	12 ft. (20 ft. maximum)	15 ft.
Single use Commercial Driveway	30 ft.	25 ft.
Single use Industrial Driveway	30 ft.	40 ft.
Multiple Use Commercial Driveway	40 ft.	40 ft.
Multiple Use Industrial Driveway	40 ft.	40 ft.

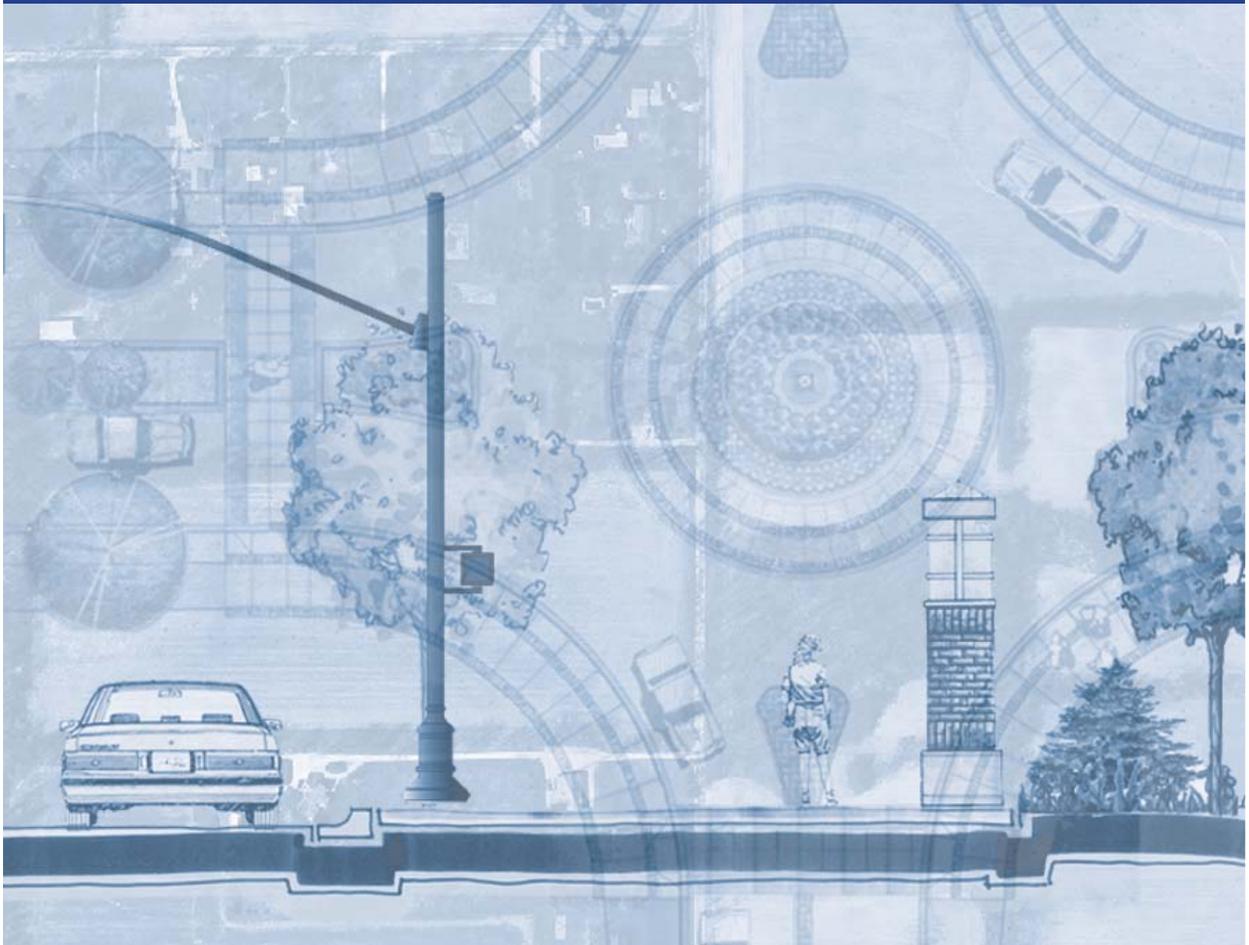
IMPLEMENTING THE PLAN

Two primary methods exist for implementing access management on Westfield corridors. The first method is through the design of road improvement projects. The second implementation method is through zoning control of development in Westfield's arterial corridors. This second method would recognize that access management recommendations be adopted as an addition to the Town's zoning ordinances. This could describe access management provisions for all arterial roads in Westfield. In addition, access management provisions could be included in the definition of a zoning overlay district for a specific corridor. These provisions would only apply within the defined overlay district.

The access management plan is critical to roadway function. Once implemented, it will help to preserve the integrity of the roadway function with high efficiency. In addition, it will help to reinforce the roadway system as a consistent, master-planned corridor while increasing the safety of the roadway.

4

CORRIDOR APPLICATION



4 CORRIDOR APPLICATION



INTRODUCTION

There were two primary objectives to this report. The first, was to establish guidelines for how to best use the space within the right-of-way to enhance the appearance and function of Westfield's major roadway corridors. The conceptual enhancements and design treatments developed in this study provide a unique set of treatments that will be used to create prototypical treatments that will be used to accomplish this objective. The second was the application of these guidelines to two prototypical corridors: Oak Ridge Road and Carey/Grassy Branch Roads.

The information on the following pages illustrates how the conceptual enhancements are to be applied to real corridors. These recommended application areas further defines the vision for all corridors within the community. The conceptual plans will serve as a visual guide for designers and decision makers and will provide the basis for the final design of each segment of the project.

PROJECT LOCATION

The study area for this project was determined based on the expected construction and traffic modifications that will likely result from future US 31 upgrades. Oak Ridge Road and Carey/Grassy Branch Road are the two primary arterial corridors that parallel US 31 to the east and west. When US 31 is upgraded to a limited access highway, these two road corridors will become major north-south routes for local traffic.

The study area for this prototypical application includes Oak Ridge Road, Carey Road, and Grassy Branch Road from 146th Street to State Road 38. For purposes of this study the property within approximately 1,000 feet of each corridor is also included. Most of the study area is within the Town of Westfield with the remaining property in unincorporated Hamilton County.

CORRIDOR DESIGN PROCESS

As discussed earlier in this report, the design processes consisted of a four step approach that was completed with the guidance of the Town of Westfield, appointed steering committee members and additional input from the public. The design process included the following parts:

- ◆ Existing conditions analysis
- ◆ Program development
- ◆ Goals and objectives
- ◆ Conceptual corridor master plan design

Complete corridor analysis information, along with program development input was used to determine a working set of goals and objectives that could be applied to the Town's corridor system as a whole. For the purpose of applying the conceptual corridor enhancements, previous information was used, along with additional analysis on the two specific roadway corridors. By using the additional corridor specific information, the conceptual corridor enhancements discussed in Section 2 were applied to each corridor and created a corridor master plan for both Oak Ridge Road and Carey/Grassy Branch Road.

EXISTING CORRIDOR CHARACTER

By examining the existing corridor make-up and character, the design team was able to understand where right-of-way restrictions might occur, the visual character of existing neighborhoods, and specific environmental opportunities or concerns. Figures 4-1 and 4-2 illustrate the character of both roadway corridors.

Oak Ridge Road and Carey/Grassy Branch Roads are currently rural, two-lane country roads with mature trees lining them in many locations. The mature trees contribute to the visual appeal of the roadway and also provide additional screening for the surrounding land uses. With most land used for agriculture or suburban residential development, the character of the study area remains rural. Agricultural land uses dominate the corridors north of SR 32; the rural character of Westfield is reinforced in this area. The southern sections of both corridors are more aggressively developed with single-family residential. Commercial and industrial areas also exist, typically in close proximity to major intersections. Development pressures from Indianapolis and Carmel are evident on the southern portion of the corridors with a large amount of single-family residential development occurring. The rural agricultural land and farmsteads south of State Road 32 are rapidly being converted to suburban neighborhoods.

EXISTING CORRIDOR CONDITIONS

Each corridor was looked at individually to determine the existing character, land uses and areas of interest. These findings were presented to the steering committee in a series of slides, some of which are shown in Figure 4-3. The steering committee and design team used the following findings to craft an appropriate set of corridor enhancement applications. Figure 4-4 illustrates the existing conditions of the corridor.

Existing Land Uses- The land uses within the study area are classified into nine categories: agricultural, commercial, industrial, institutional, recreational, single-family residential, multi family residential, rural residential, and vacant. Each land use is defined as follows:



Figure 4-1: Typical corridor character images from Carey/Grassy Branch Road.



Figure 4-2: Typical corridor character images from Oak Ridge Road.

Agricultural- Agricultural land uses include farmsteads, cropland, nurseries, and horse training areas. Much of the Town of Westfield is very rural in character. Along the corridor, approximately 4,225 acres, or 57 percent, is agricultural.

Commercial- Commercial uses are typically related to the sale of products and services; this can include shopping centers, central business districts, office buildings, automotive and other repair services, hotels, restaurants, gas stations, neighborhood stores, and most any other enterprise which serves clients or provides employment (except industrial uses). This land use tends to locate near major transportation arterials. An example of commercial land use along the corridors includes the shopping center at SR 32 and Carey Road.

Industrial- Industrial land uses include manufacturing and industrial parks, light industry (fabrication or packaging products), and transportation/ distribution facilities. The location of industrial sites, like commercial, are usually near major transportation arterials and the demand is driven by the workforce, transportation systems, and the end users. The Custom Commerce Park, just south of SR 32 on Oak Ridge Road, is an example of an industrial land use.

Institutional- Land uses such as education, government, religious, health, correctional, and military facilities are classified as institutional land uses. Institutional land uses along the corridors include the three elementary schools (Oak Trace, Carey Ridge, and Washington Woods), Radiant Christian Life Church on Carey Road, and the electrical substation on Oak Ridge Road.

Recreational- Recreational land uses typically include all indoor and outdoor recreational facilities, public parks, pedestrian and bicyclist trails, and all associated buildings, parking areas, and surrounding grounds. Westfield has a developed recreational system; the 146th Street trail, Bridgewater Golf Course, Cool Creek Park, and the soccer/ sports complex on Carey Road are examples within the study area. The current trail system is focused on providing pedestrian connects to all major destinations within Westfield. New development along major roadway is required to install multi-use paths in order to create a continuous connection along major roads. A total of approximately 437 acres of recreational land uses exist within the study area, or six percent of the total land uses.

Residential- Residential uses include the land and all dwelling structures designed for living such as single-family houses, townhouses, multi-family low rise or high rise, manufactured houses, as well as all ancillary structures such as shed, garages, car ports, etc. Mobile home parks are also classified in this category. Westfield has three categories of residential land uses: single-family, multi-family, and rural residential.

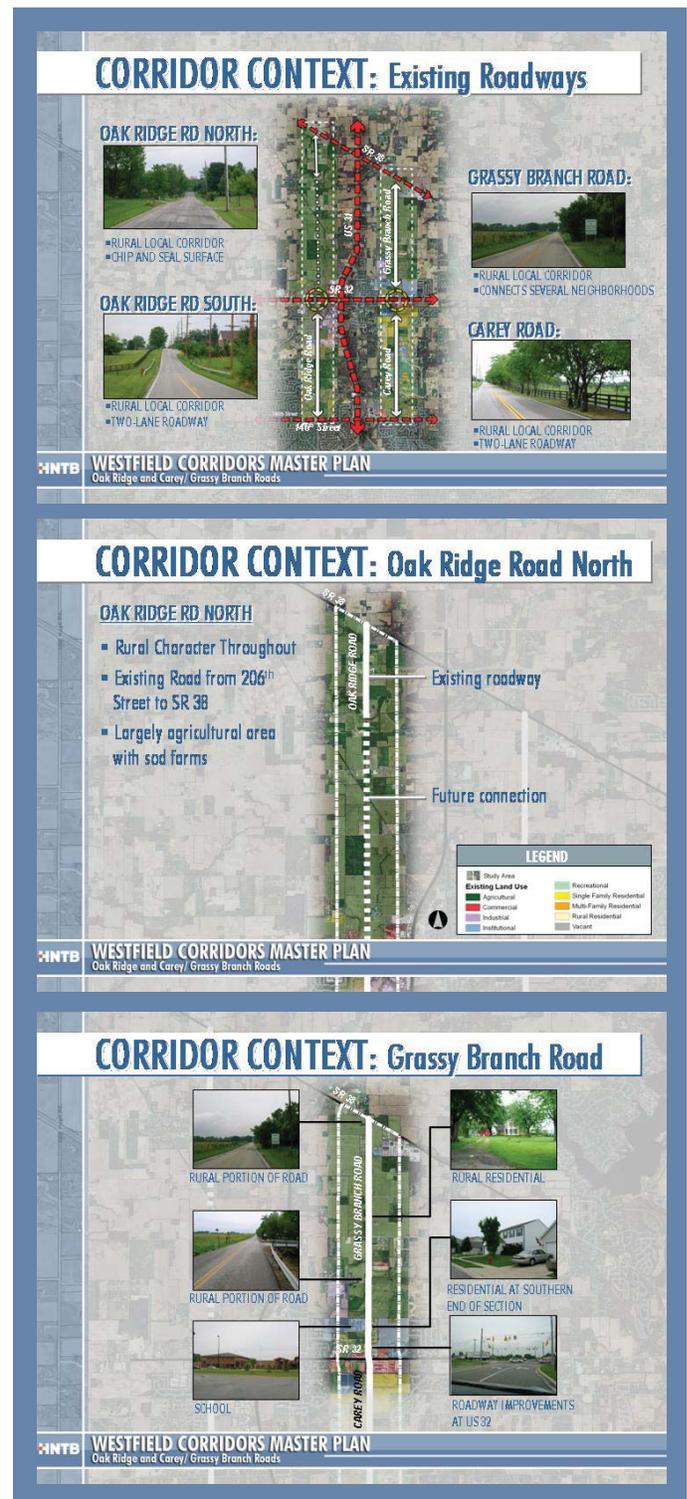


Figure 4-3: Images taken from the first steering committee presentation which focused on the existing conditions of the corridor study area.

The single-family land uses consist mainly of the neighborhood and subdivision developments. These are concentrated south of SR 32 along both corridors. However, residential development is rapidly moving north of SR 32 on Grassy Branch Road. Approximately 1,133 acres, or 15 percent of land uses, are single-family residential.

Multi-family residential development is also present within the study area. Multi-family residential occupies approximately 48 acres within the study area; this is less than one percent of the land uses.

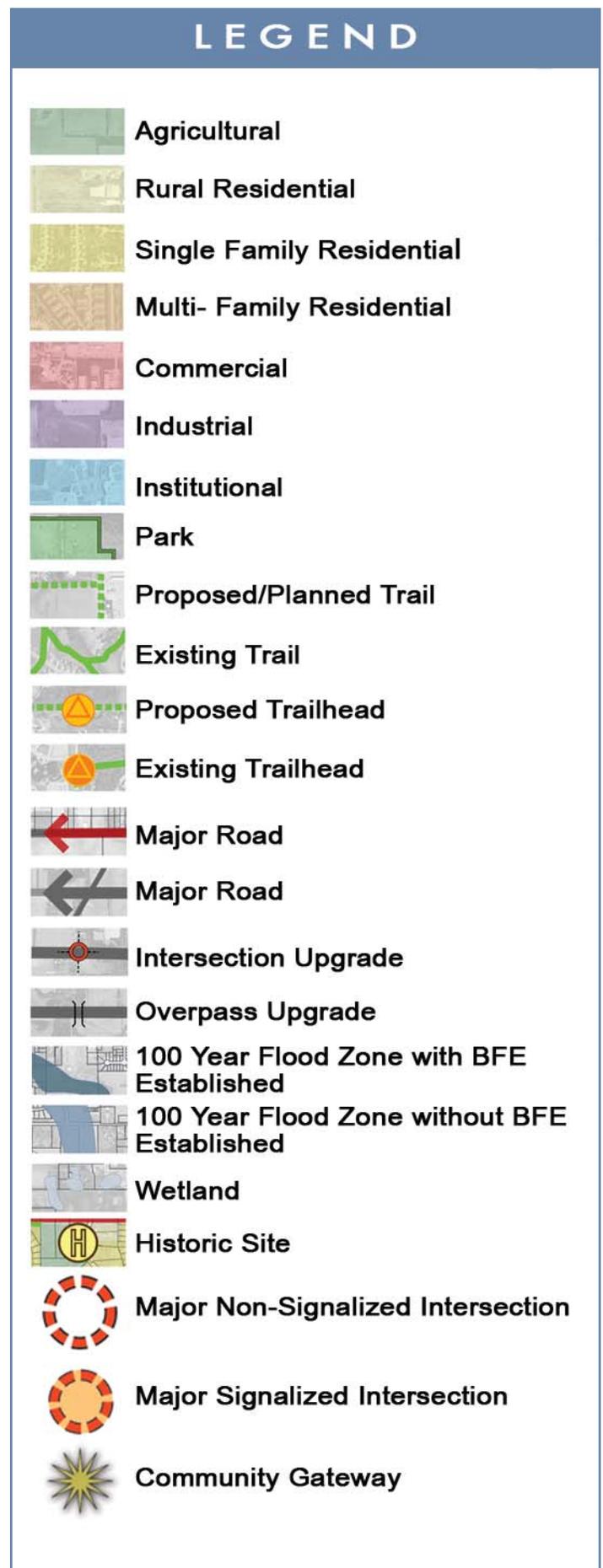
Rural residential reinforces the rural image of the two corridors and is present mainly north of SR 32. This land use includes the farm houses, farmsteads, as well as single-family houses on lots larger than five acres. Rural residential land uses do not have agricultural activities, such as cropland, but may consist of open fields or woodlands. This land use is typically located within close proximity to agricultural land uses.

In addition to examining the physical character and land uses of each corridor, additional items of interest or concern were noted. These items are noted and illustrated in Figure 4-5.

Community gateways- The Town is currently installing a gateway at the intersection of SR 32 and Gray Road. The design is finished and construction will begin soon. Additionally, two potential gateways to Westfield exist on each corridor at State Road 38 and 146th Street. Also, two gateways to Downtown Westfield exist along State Road 32. These areas have the potential to let travelers know they have entered Westfield.

Regional and Local Trails- Currently, Westfield has a well developed trail and park system, including various multi-use paths, recreation facilities, ball fields, and parks. An additional community facility site is proposed on the extension of Oak Ridge Road that would include a YMCA, library and new school. Westfield is also in the process of creating pedestrian links to the local schools. Significant future connections to regional trails, the Midland Trace, Monon Greenway, and 146th Street Trail, also exist. By capitalizing on these non-vehicular connections, important pedestrian corridors can be built to link destinations.

Roadway Upgrades- There are planned transportation upgrades within the study area. These include the U.S. 31 upgrade, a bridge upgrade on Grassy Branch Road, the realignment of Union Street, widening of SR 32, and finally, the future alignment of Oak Ridge Road north of SR 32. All of the planned transportation upgrades will enhance the



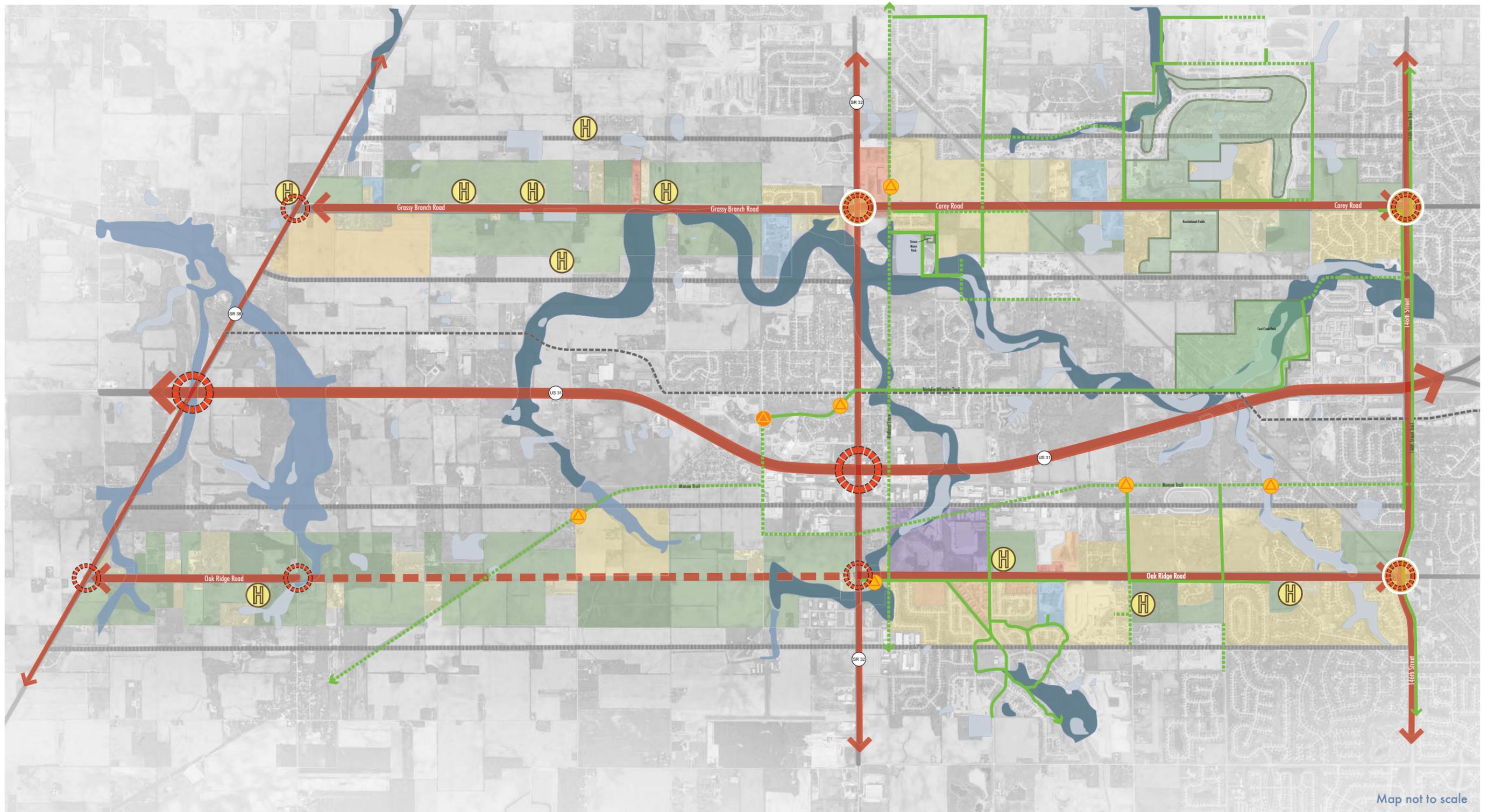
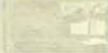
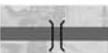


Figure 4-4: The existing conditions map, generated using information gathered from both corridors, shows existing land uses, historic sites, regional and local trails as well as signalized and non-signalized intersections.

CORRIDOR EXISTING CONDITIONS MAP



LEGEND

-  **Agricultural**
-  **Rural Residential**
-  **Single Family Residential**
-  **Multi- Family Residential**
-  **Commercial**
-  **Industrial**
-  **Institutional**
-  **Park**
-  **Proposed/Planned Trail**
-  **Existing Trail**
-  **Proposed Trailhead**
-  **Existing Trailhead**
-  **Major Road**
-  **Major Road**
-  **Intersection Upgrade**
-  **Overpass Upgrade**
-  **100 Year Flood Zone with BFE Established**
-  **100 Year Flood Zone without BFE Established**
-  **Wetland**
-  **Historic Site**
-  **Major Non-Signalized Intersection**
-  **Major Signalized Intersection**
-  **Community Gateway**

current system and are anticipated to reduce the current congestion and traffic.

Restricted right-of-way- Heavy traffic is a concern along Carey Road. As roadways need to be expanded, the design must contend with the limited right-of-way in some areas as well as the existing encroaching vegetation. The existing development on Carey Road from 146th Street to SR 32 could restrict the acquisition of right-of-way in the area, and therefore require a modified roadway treatment. Utility constraints also exist, including a large utility pole that cannot be relocated on Carey Road, a substation on Oak Ridge Road, and a large culvert and creek along the northern portion of Oak Ridge. These three utility constraints will need to be considered in future designs and recommendations.

CORRIDOR LAND USE RECOMMENDATIONS

The Town of Westfield is currently undergoing an update to their comprehensive plan. Efforts have been made to ensure the final land use plan presented in this report is consistent with that of the comprehensive plan update. According to the Land Use Concept Plan, most land uses within Westfield are residential. The plan calls for new residential development north of SR 32 and recognizes the existing residential south of SR 32. The plan also calls for business parks, local commercial, employment corridors, and regional commercial in addition to the downtown and village areas.

During the past 15 years, Westfield has experienced significant population growth. From 1990 to 2000, Westfield experienced a 180 percent increase in population; Washington Township experienced a 98 percent increase and Hamilton County only experienced a 68 percent population increase. This demonstrates the development pressure being experienced in the study area in comparison with the remainder of the county. In 2005, the U.S. Census estimates that Westfield has a population of approximately 12,200 people; this is an increase of about 31 percent from 2000 to 2005 (U.S. Census).

With this increase in residential development has come an increase in associated land uses, such as retail centers, restaurants, and some industrial development. Understanding the current development patterns and local market conditions is an important component in planning for the future of Westfield's corridors.

The trends and tendencies of the current market indicate which uses are likely to develop in the area; this can then be incorporated into Westfield's vision for the two corridors.

By looking at the existing land use conditions, as well as future development, several key areas have been identified as areas

of interest along the corridor. These areas have the potential to be key links for vehicular traffic, as well as non-motorized traffic. These areas are illustrated in Figure 4-6 and include the following:

- ◆ Washington Woods Elementary School
- ◆ Oak Trace Elementary School
- ◆ Carey Ridge Elementary School
- ◆ The Monon Trail
- ◆ The Midland Trace
- ◆ The 146th Street Trail
- ◆ Habig Fields
- ◆ The Bridgewater Club
- ◆ Downtown Westfield
- ◆ Commercial Development (SR 32 and Carey Road)

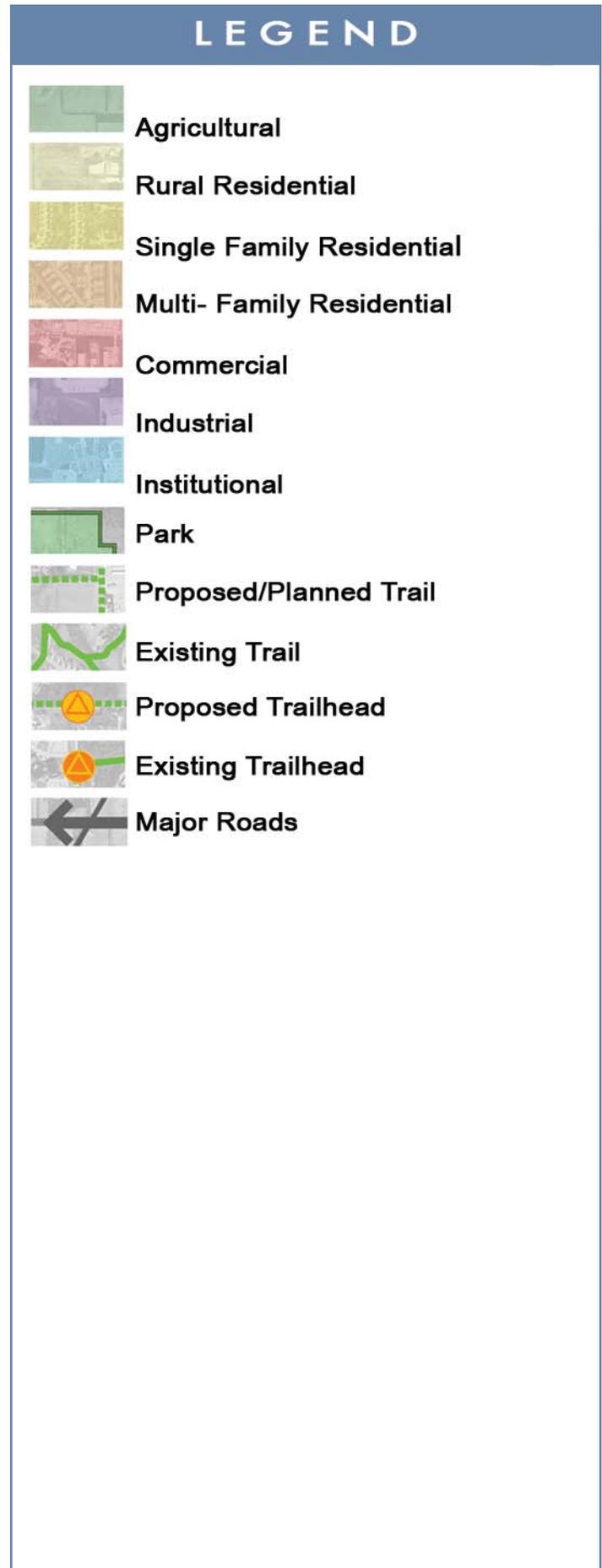
Many areas of high pedestrian activity exist along the two corridors. These occur at the intersections of major roads as well as at various destinations. The three elementary schools generate a higher level of pedestrian traffic during school hours. Three elementary schools are located along the study corridors: Washington Woods Elementary on Grassy Branch Road north of SR 32, Oak Trace Elementary on Oak Ridge Road south of SR 32, and Carey Ridge Elementary on Carey Road south of SR 32.

In addition, the local and regional trail crossings at major roads have a high number of pedestrians. The most significant trail crossings within the study area are the Monon Trail crossing at the Oak Ridge Road Extension, the Midland Trace crossing at Oak Ridge and Carey Roads, and the 146th Street Trail crossing at Oak Ridge and Carey Roads. As the current trail system is expanded, the non-vehicular traffic will only increase.

Habig Field, a recreation field complex, also exists on Carey Road between 151st Street and 161st Street. This complex consists of 20 youth soccer fields. The Bridgewater Golf Course is also located on Carey Road and generates a higher level of pedestrian traffic. Finally, major commercial nodes exist in Downtown Westfield and at the intersection of SR 32 and Carey Road. The Midland Trace will connect to this commercial area. These areas of high pedestrian traffic lack a visual designation and sufficient pedestrian enhancements to alert vehicles.

The existing and proposed land uses also indicate that there are several potential gateways into Westfield along the two corridors. These areas should be utilized as “front door” to the community and further enhance the visual distinction between Westfield and surrounding communities.

Different land uses generate varying demands on the roadways;



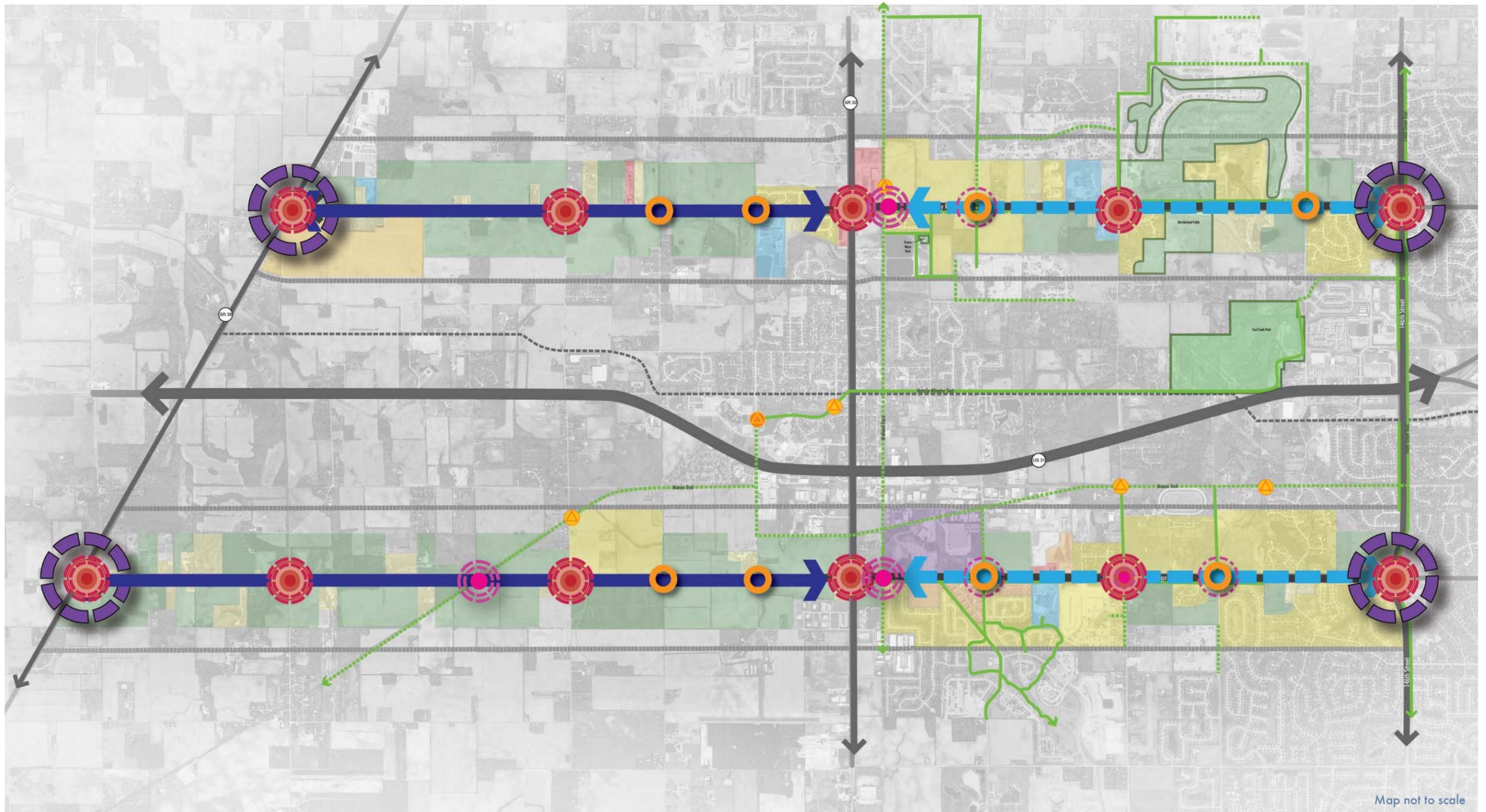
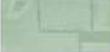


Figure 4-7: By utilizing the goals and objectives discussed in Section 2, the prototypical corridor enhancements were applied to both Oak Ridge Road and Carey/Grassy Branch Road. This conceptual plan illustrates the overall treatment for both corridors.

OVERALL CORRIDOR CONCEPT PLAN



LEGEND

-  **Agricultural**
-  **Rural Residential**
-  **Single Family Residential**
-  **Multi- Family Residential**
-  **Commercial**
-  **Industrial**
-  **Institutional**
-  **Park**
-  **Proposed/Planned Trail**
-  **Existing Trail**
-  **Proposed Trailhead**
-  **Existing Trailhead**
-  **Major Roads**
-  **Modified Parkway Cross Section**
-  **Full Parkway Cross Section**
-  **Corridor Gateway Treatment**
-  **Additional Gateway Lantern Locations**
-  **Primary Intersection Treatment**
-  **Secondary Intersection Treatment**
-  **Regional Trail Crossing Treatment**
-  **Local Trail Crossing Treatment**

for example, industrial uses will generate more truck traffic and heavier personal automobile traffic during shift changes while commercial and retail land uses will create more individual automobile trips throughout the hours of operation. The future land uses along the corridors will affect the amount of traffic on the roads. Multi-use trails and vehicular connections between neighborhoods, mixed use developments, and commercial nodes can help reduce trips on the arterials. This, in turn, can aid in creating a healthier community and reducing congestion, air pollution, and transportation costs.

SPECIFIC AREAS OF INTEREST

Elementary Schools- Three elementary schools exist along the study corridors: Washington Woods Elementary, Oak Trace Elementary, and Carey Ridge Elementary. The areas have large amounts of children on the school premises and throughout the surrounding area. Due to the increase number of children at these locations on the corridors, additional enhancements are needed. Visual alerts are needed to signify to drivers extra safety should be used in these areas. Also, the pedestrian connectivity needs to be enhanced around the elementary schools to further increase safety of the pedestrians.

Major Trail Crossings- There are five major trail crossings along the two corridors. These areas will have a larger number of pedestrians and require additional enhancements. Drivers should be alerted of the trail crossing through visual enhancements, such as a change in paving material, landscaping treatments, or signage.

Habig Fields- Habig Fields seasonally has high numbers of pedestrians accessing the site; both additional visual enhancements and additional connectivity are needed.

The Bridgewater Club- The golf course and surrounding multi-use paths accommodate numerous pedestrians and golf carts. Drivers should be alerted of this visually in addition to enhancing the pedestrian connections to neighboring areas.

Commercial Node (SR 32 and Carey Road)- While this commercial location does not currently generate a large volume of pedestrians, the extension of the Midland Trace will increase pedestrian access. Therefore, visual alerts and additional pedestrian connections should be made.

Downtown Westfield- Although this area is not directly within the study area, the largest number of pedestrians utilize this area. Due to its close proximity to the study area, additional connectivity enhancements should be implemented to encourage pedestrian activity along the two corridors.

CORRIDOR CONCEPT PLAN

Figure 4-7 illustrates the conceptual enhancement plan for both Oak Ridge Road and Carey/Grassy Branch Road. The concept plan focuses on the following key elements:

Corridor Character- A full application of the parkway guideline has been applied to Oak Ridge Road beginning at SR 38 and extending south to SR 32. A modified parkway cross section has been applied from SR 32 to 146th Street due to existing development and right-of-way constraints. Along Carey/Grassy Branch Road a full parkway cross section has been applied in the areas of SR 38 to SR 32 and again from approximately 169th Street to 146th Street. A modified cross section has been applied in the area of SR 32 and 169th Street.

Pedestrian Enhancements- Multi-use trails are accommodated on both sides of the corridor where possible. As illustrated in the parkway cross section guidelines, trails are placed on both sides of the roadway in the full cross section treatment, and along one side in the modified treatment. In addition, pedestrian nodes are located at primary and secondary arterial intersections, as well as regional and local trailheads.

Regional and Local Trailheads- Trailheads and trail crossings have been placed at the intersections of the Monon and Midland Trace trails as well as four other local trail intersections.

Intersection Treatments- There are 11 locations for primary intersection treatments. These locations are either existing or future locations for signalized intersections. In addition there are eight locations for secondary intersections along the corridors.

Gateway Treatments- Gateway treatments are located at the intersections of 146th Street and SR 38. Additional gateway structure applications are at key areas of interest along the corridors.

Wayfinding Signage- Vehicular wayfinding signage is located at each primary intersection location along the corridors. Pedestrian wayfinding signage is located at the gateway intersections, as well as the trailhead intersections of the corridors.

The following pages detail the corridor enhancement recommendations for the specific corridors of Oak Ridge Road and Carey/Grassy Branch Road. By applying the corridor enhancements, a new vision is realized for the corridors within Westfield. The following corridor enhancements were applied:

- ◆ Raised medians
- ◆ Landscape Treatments
- ◆ Pedestrian Treatments
- ◆ Ornamental Lighting
- ◆ Intersection Treatments
- ◆ Secondary Gateway System
- ◆ Wayfinding Signage System
- ◆ Trail Crossing Treatments

Although the direct application of each enhancement is not identified in the pages that follow, general recommendations have been put in place to direct the consistent application of these elements. Standard enhancements, such as raised medians, landscape treatments, and ornamental lighting, are those that are applied consistently to the entire corridor. The following are general guidelines for the placement of the standard enhancements:

Raised medians- Raised medians occur as illustrated in Figure 2-11. Where possible, the desired median width is 16 feet. In areas where right-of-way is restricted the width of the raised median can be reduced to 8'.

Corridor Landscape Treatments- Corridor landscape treatments occur throughout the corridors. All existing, significant masses of vegetation should be retained where possible. In areas where vegetation must be removed, native shade trees, ornamental trees and large shrub species can be planted in natural masses. These plantings should mimic the existing vegetation palette and pattern when possible. Figure 2-20 illustrates the typical corridor planting treatment.

Corridor Median Plantings- Corridor median plantings take place at specific locations along the corridor. In the case of Oak Ridge Road median plantings are being provided at the Monon and Midland Trace trailheads, the two local trail heads south of SR 32, and Oak Trace Elementary School. In the case of Carey/Grassy Branch Road median plantings are being provided at Washington Woods Elementary, Carey Ridge Elementary School, the Midland Trace trailhead and two local trailheads south of SR 32. These plantings should be ornamental in nature and feature evergreens, ornamental grasses, and native perennials. Figure

2-20 illustrates the typical median planting treatment.

Intersection Plantings- Intersection plantings take place at all primary and secondary intersection treatments. These plantings are ornamental in nature and feature ornamental trees, and low growing plantings that feature year round interest. Figure 2-22 and 2-23 illustrate the typical intersection treatment for primary and secondary intersections.

Corridor Lighting- Corridor lighting is recommended to be placed every 100' along both sides of the corridor.

Decorative Signal Poles- Decorative signal poles are recommended for each primary intersection along the corridor.

In addition to the general application guidelines listed above, specific locations and applications are illustrated on the pages that follow.

CORRIDOR CHARACTER

As described in Section 2, a parkway guideline was developed, which was to be applied to each primary and secondary arterial corridor within the town. For the purposes of this specific corridor study two parkway cross sections were used: standard and modified.

The full parkway cross section has been applied to Oak Ridge Road from SR 38 to SR 32 and to Carey/Grassy Branch Road from SR 38 to SR 32. These areas will receive the parkway application illustrated in Figure 4-8 and provide the following:

- ◆ 27'-6" travel lanes (two lanes each direction)
- ◆ 16' raised median
- ◆ 8' planted utility strip along both sides of the road
- ◆ 8' pedestrian corridor along both sides of the road (walk or multi-use trail)
- ◆ 8'-6" additional right-of-way beyond pedestrian walks which can include screen plantings or overhead utilities

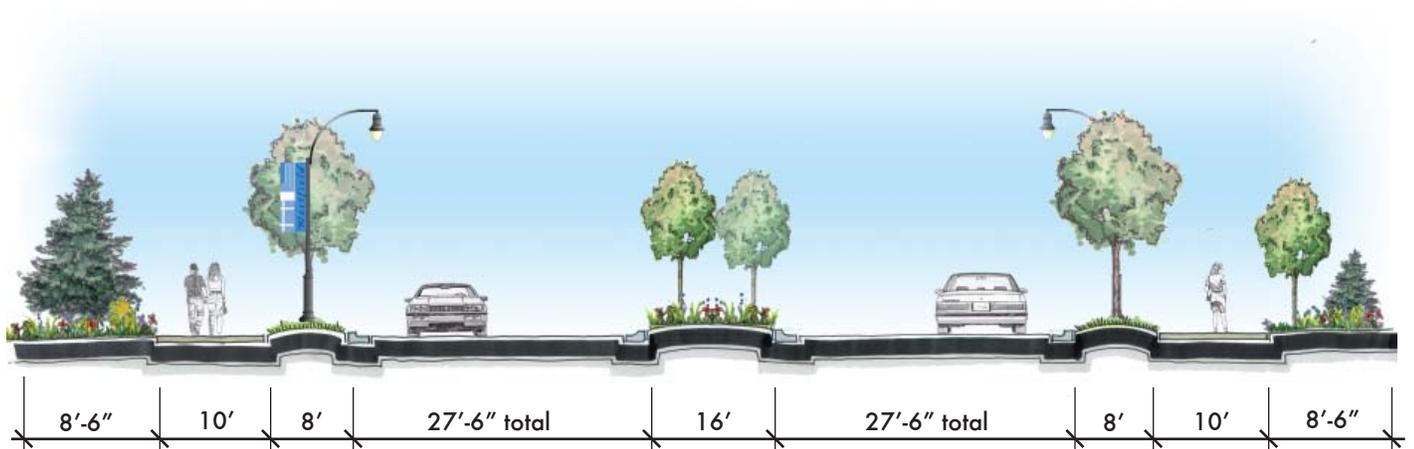


Figure 4-8: The full parkway cross section contains a 120' right-of-way.

Due to existing development and potential restrictions on right-of-way acquisitions, a modified parkway cross section has been applied to Oak Ridge Road from SR 32 to 146th Street and on Carey/Grassy Branch Road from SR 32 to 146th Street. These areas will receive the parkway application illustrated in Figure 4-9 and provide the following:

- ◆ 27' travel lanes (two lanes each direction)
- ◆ 8' raised median
- ◆ 8' planted utility strip along one side of the road
- ◆ 8' pedestrian corridor along one side of the street (walk or multi-use trail)
- ◆ 8' additional right-of-way beyond pedestrian walk which can include plantings or overhead utilities
- ◆ 4' additional right-of-way beyond roadway which can include plantings or overhead utilities

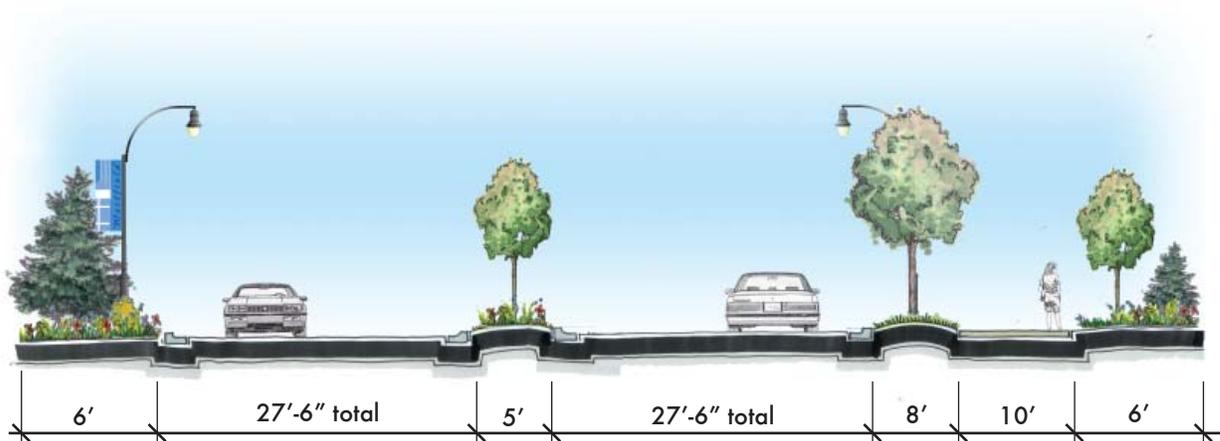
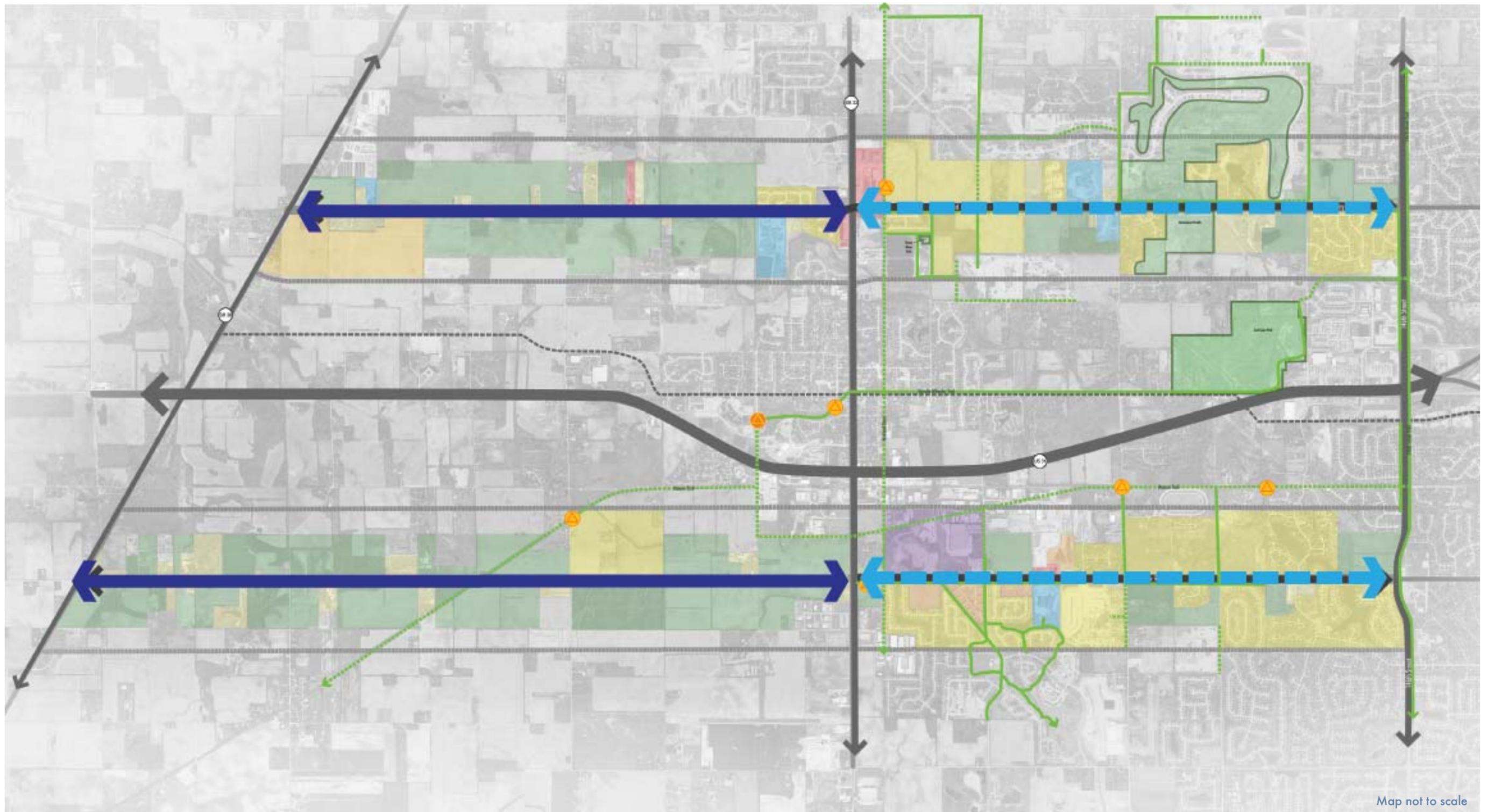


Figure 4-9: The modified parkway cross section contains a 90' right-of-way.



Map not to scale

Figure 4-10: North of SR 32 both corridors will receive a full parkway cross section, while south of SR 32 both corridors receive a modified parkway cross section due to existing development and restricted right-of-way. This prototypical application illustrates how the concept can be modified when applied to areas where existing conditions or development limits a full cross-section application.

OVERALL CORRIDOR CHARACTER PLAN



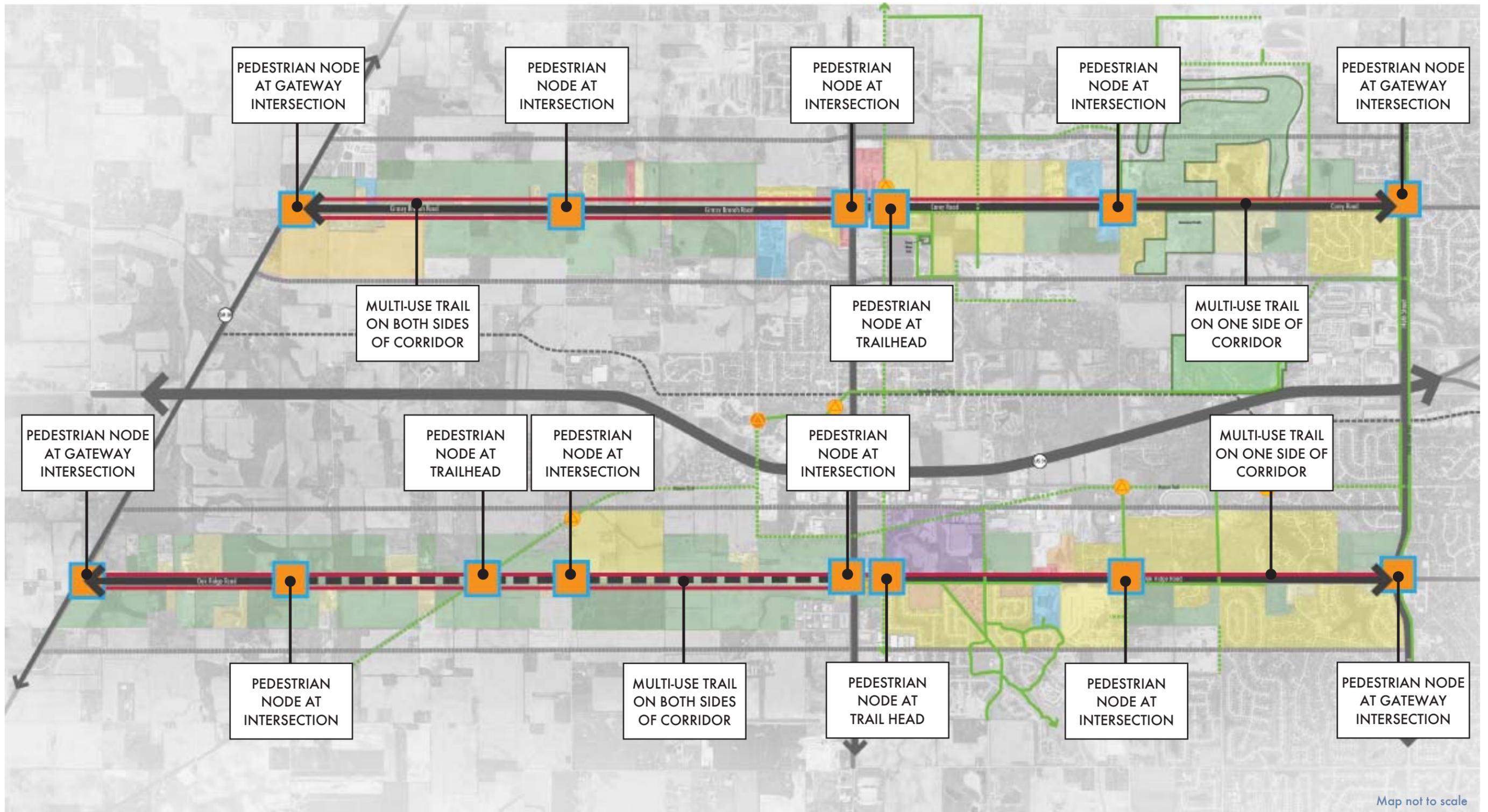


Figure 4-11: Pedestrian treatments include multi-use trails along the roadway and pedestrian nodes. Pedestrian nodes are used with varying degree of investment at gateway intersections, primary and secondary intersections and trailheads.

CORRIDOR PEDESTRIAN TREATMENTS



PEDESTRIAN TREATMENTS

Pedestrian treatments include walks, multi-use trails and pedestrian nodes. As illustrated in the corridor parkway cross sections in Figure 4-12, multi-use pathways are accommodated along both sides of the road where possible, and along one side in the modified cross section. Along Oak Ridge Road 8' multi-use trails are included along both sides of the road from SR 38 to SR 32 and along Carey/Grassy Branch Road from SR 38 to SR 32. One 8' multi-use trail is accommodated along Oak Ridge Road from SR 32 to 146th Street and along Carey/Grassy Branch Road from SR 32 to 146th Street.

Where these multi-use trails cross primary and secondary arterial corridors, illustrated in Figure 2-22, pedestrian nodes have been designed to allow for a larger area of pedestrian refuge. Primary intersections allow for a larger area of pavement at the corners of the intersection that utilizes typical concrete and colored brick paver bands. These intersections also receive additional ornamental tree and shrub plantings directly behind the pedestrian area. In addition, concrete and colored brick pavers are used to create a wider pedestrian cross walk across the primary intersection. Pedestrian nodes at primary intersections, illustrated in Figure 4-11, are located at the following intersections:

- ◆ Oak Ridge Road and SR 38
- ◆ Oak Ridge Road and 206th Street
- ◆ Oak Ridge Road and 191st Street
- ◆ Oak Ridge Road and SR 32
- ◆ Oak Ridge Road and 161st Street
- ◆ Oak Ridge Road and 146th Street
- ◆ Grassy Branch Road and SR 38
- ◆ Grassy Branch Road and 191st Street
- ◆ Grassy Branch Road and SR 32
- ◆ Carey Road and 161st Street
- ◆ Carey Road and 146th Street

At secondary intersections, pedestrian nodes are constructed of standard concrete. The areas are the same size as the primary intersections and feature ornamental tree plantings directly behind the area of refuge. Pedestrian cross walks at these secondary intersections are constructed of 12' wide white, thermoplastic striping. These cross walks promote safe, pedestrian environments while utilizing a subtle material palette. Pedestrian nodes at secondary intersections, illustrated in Figure 2-23, are located at the following intersections:

- ◆ Oak Ridge Road and 186th Street
- ◆ Oak Ridge Road and 181st Street
- ◆ Oak Ridge Road and 169th Street
- ◆ Oak Ridge Road and 156th Street
- ◆ Grassy Branch Road and 186th Street
- ◆ Grassy Branch Road and 181st Street
- ◆ Carey Road and 169th Street
- ◆ Carey Road and 151st Street

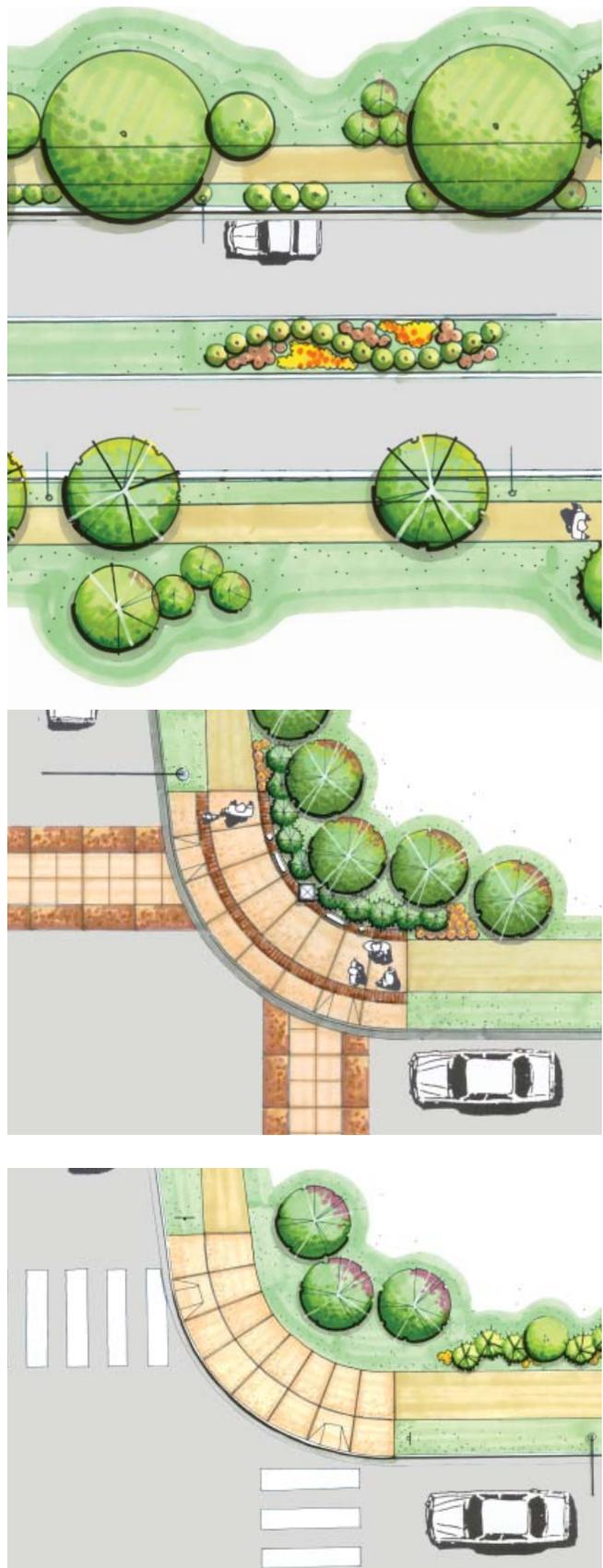


Figure 4-12: Typical plan views of multi-use trail and pedestrian nodes at primary and secondary intersections. Labeled drawings can be found in Section 2.

REGIONAL AND LOCAL TRAIL CROSSINGS

Along the two corridors, two major regional trail systems intersect, along with several local trail systems. Figure 4-14 illustrates the Monon and Midland Trace trail crossings as well as several small, local trail crossings. In order to promote a safe pedestrian environment, trailhead treatments have been designed for both the regional and local trails.

At these three locations enhancements should be utilized to set the crossings apart from other intersections in the neighborhood and also to provide additional safety to pedestrians and trail users. In order to protect the integrity of the historic rail corridor, regional trail crossings will be allowed to continue across the corridor utilizing existing rail corridors. Additional pedestrian paving treatments have been added to increase the safety in these areas along with additional signage. At each trail crossing, a pedestrian node is proposed that serves to increase visibility, and act as a trail head and a place for individuals to stop, rest and get trail and community information. At each node, pedestrian pavement is used to create a large area of refuge for trail users. This area is constructed of concrete and brick paver bands, similar to those at the primary intersections along the corridor. Regional trail crossing treatments are illustrated in Figures 2-24, 2-26 and 2-27.

Gateway lanterns, which are discussed later in this section, are also found within each node and also in the median. These three lanterns, when seen together from the corridor, mark the crossing for pedestrian and vehicular traffic. Plantings are used to amplify the visibility of major pedestrian crossing locations, and are also used to control pedestrian crossings to very specific locations on the corridors. Pedestrian wayfinding signs and site furniture are also located within the pedestrian node. Wayfinding signage will be used to direct regional trail traffic into Westfield, as well as show a larger context within the trail system.

In addition to the regional trail crossings, local trails, created by the multi-use pathways are also present. These trail systems connect small commercial and business developments to the neighboring communities and subdivisions. Additional pedestrian paving treatments have been added at these locations to increase safety for trail users. At each trail crossing, a pedestrian node is proposed that serves as visibility and a trail head, and also a place for individuals to stop, rest and get trail and community information. Rather than providing a larger paved crosswalk across the roadway, trail users are directed to nearby controlled intersections for crossing. Heavy plantings within the 8' utility strip are used to control pedestrian crossings, and to provide further visibility of the area. Gateway lanterns, along with ornamental plantings within the median are also used at local trail intersections. Local trail crossings are illustrated in Figures 2-25- 2-27.

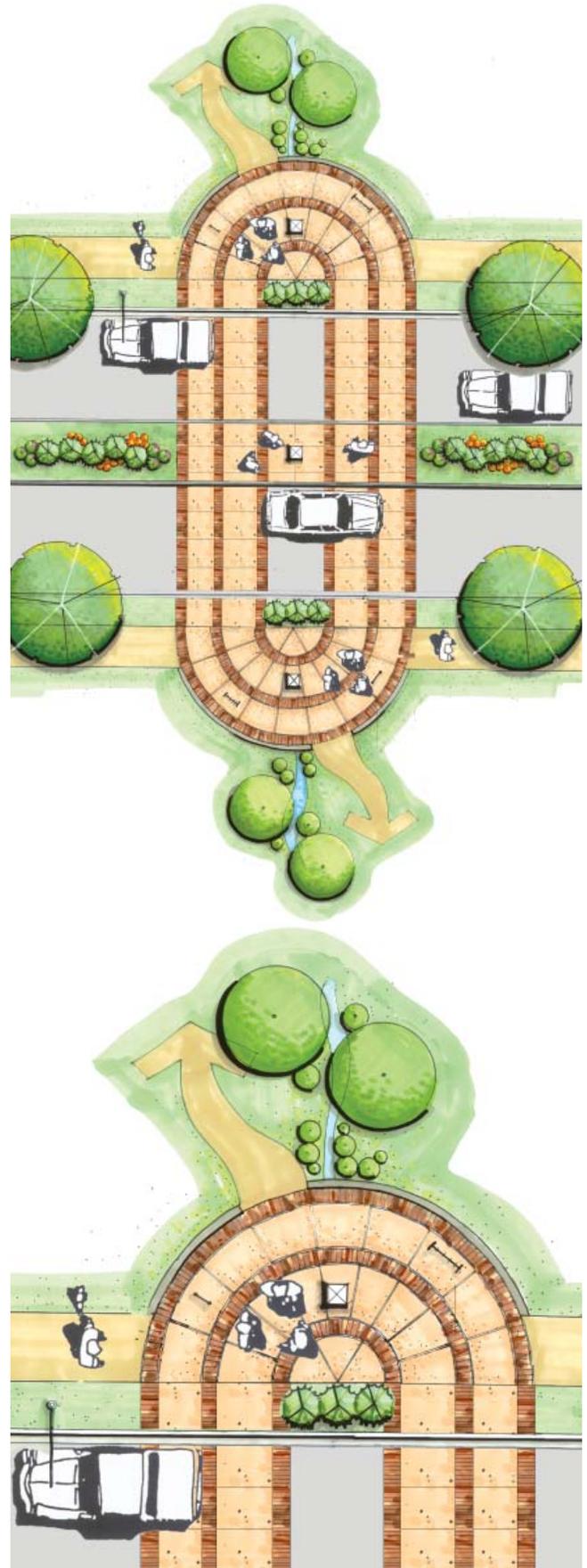


Figure 4-13: Typical plan views of the regional trail crossing and enlarged trailhead at both regional and local trail crossings. Labeled drawings can be found in Section 2.

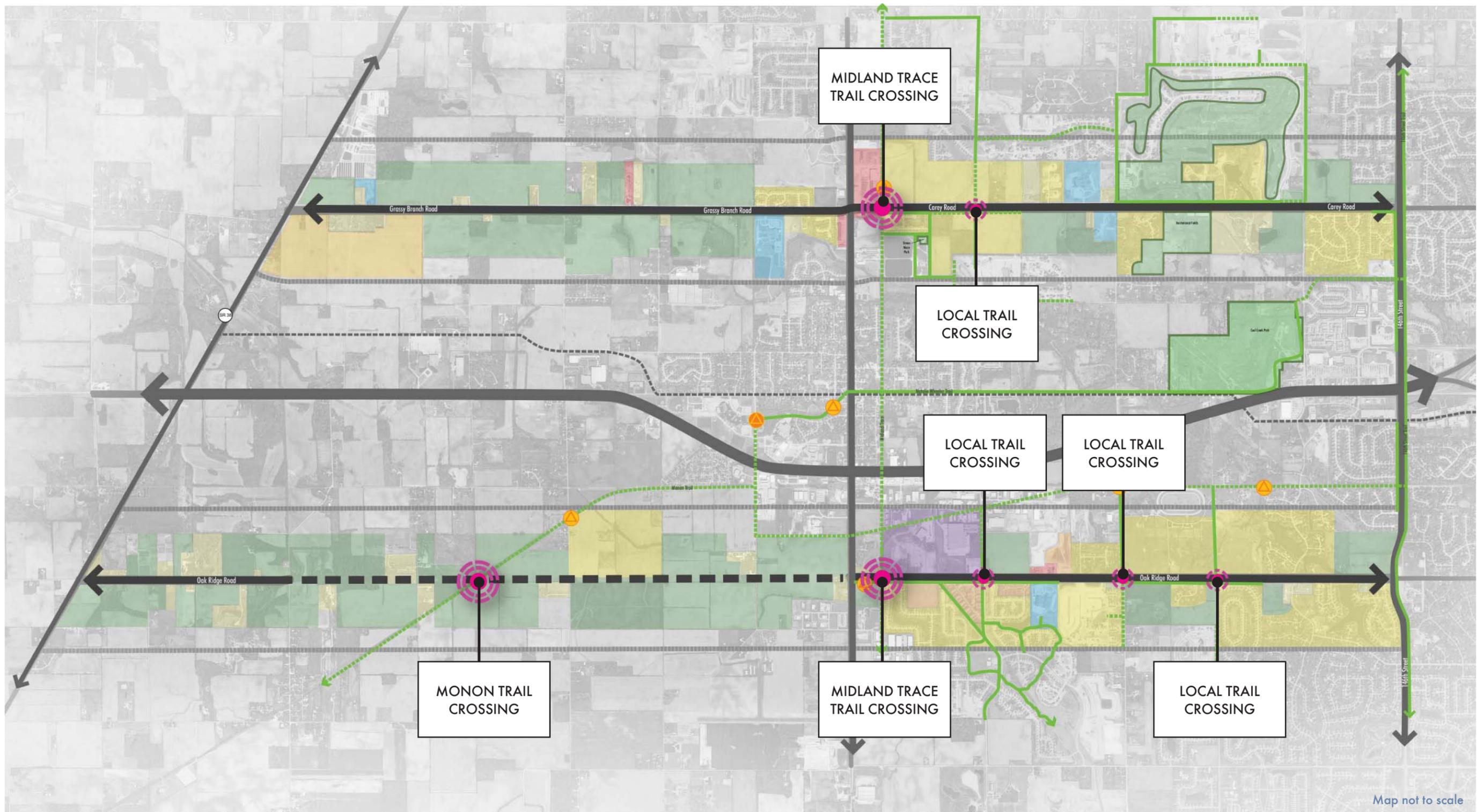


Figure 4-14: Pedestrian treatments also include the regional and local trail crossings that occur throughout the corridors. Both types of crossings utilize the same material palette and ensure a safe environment for pedestrians and other trail users.

CORRIDOR TRAIL CROSSING TREATMENTS



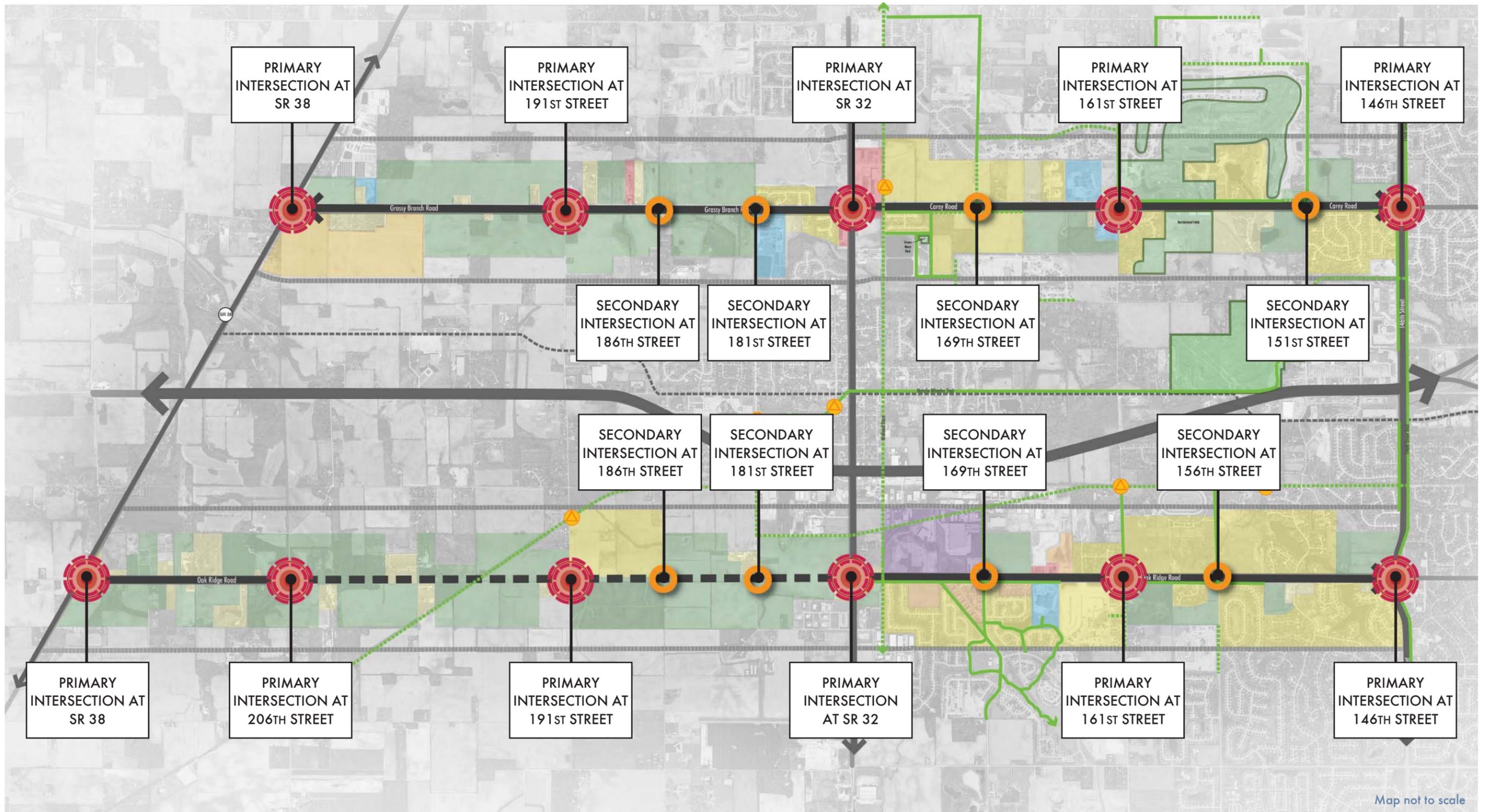


Figure 4-15: There are several existing and future locations for primary and secondary intersection treatments. Each intersection will receive a similar treatment that utilizes the same material palette.

CORRIDOR INTERSECTION TREATMENTS



INTERSECTION TREATMENTS

Throughout the corridor system in Westfield there are three types of intersections; signalized, non-signalized and roundabouts. Each type of intersection should be treated differently to provide a varying level of awareness along the corridor.

Primary intersections are those that are signalized. These intersections typically have heavy traffic counts in both the north/south and east/west directions. These intersections need to be enhanced further for the safety of pedestrians and vehicular traffic. The primary intersections along both corridors feature wider paved pedestrian crosswalks, ornamental signal poles and arms, vehicular wayfinding signs and enhanced ornamental vegetation. The intersection consists of a simple material palette that includes concrete and brick pavers. Within the pedestrian crosswalks, heavy duty concrete pavement is lined with a row of brick pavers. The bricks will be shades of brown which will blend well with the concrete color. At the corners, concrete pavement is visually broken up by the brick paver bands running through the area. Each primary intersection is also highlighted by ornamental plantings behind the pedestrian node. These plantings consist of ornamental trees and low growing shrubs, grasses and perennials. The plantings, along with the wider pedestrian crosswalk also provide a visual cue to pedestrians and vehicular traffic that they are approaching a critical interface and greater caution is warranted. Figures 2-32 and 2-33 illustrate the typical treatment at signalized intersections. The following intersections, illustrated in Figure 4-15, are recommended for primary intersection treatments:

- ◆ Oak Ridge Road and SR 38
- ◆ Oak Ridge Road and 206th Street
- ◆ Oak Ridge Road and 191st Street
- ◆ Oak Ridge Road and SR 32
- ◆ Oak Ridge Road and 161st Street
- ◆ Oak Ridge Road and 146th Street
- ◆ Grassy Branch Road and SR 38
- ◆ Grassy Branch Road and 191st Street
- ◆ Grassy Branch Road and SR 32
- ◆ Carey Road and 161st Street
- ◆ Carey Road and 146th Street

Secondary intersections are those that are not signalized, but do contain traffic control devices. Although these intersections need to be enhanced to ensure pedestrian and vehicular safety, the level of treatment identified is different than the primary intersections. The secondary intersections along both corridors feature wider pedestrian crosswalks, ornamental signal poles and arms and vehicular wayfinding signs. The pedestrian crosswalks will be constructed of striped thermoplastic white lines in order to still draw driver's attention to the crosswalk. At the corners, concrete pavement is used throughout the pedestrian node area. Each secondary intersection is also highlighted by ornamental tree plantings behind the pedestrian node. Secondary

intersection treatments are illustrated in Figures 2-34 and 2-35. The following intersections, illustrated in Figure 4-15, are recommended for secondary intersection treatments:

- ◆ Oak Ridge Road and 186th Street
- ◆ Oak Ridge Road and 181st Street
- ◆ Oak Ridge Road and 169th Street
- ◆ Oak Ridge Road and 156th Street
- ◆ Grassy Branch Road and 186th Street
- ◆ Grassy Branch Road and 181st Street
- ◆ Carey Road and 169th Street
- ◆ Carey Road and 151st Street



Figure 4-16: Typical plan views of primary and secondary intersection treatments. Labeled drawings can be found in Section 2.

ROUNDBABOUT INTERSECTION TREATMENTS

At several locations, illustrated in Figure 4-18, roundabouts could be utilized to calm and control traffic rather than using a signalized intersection. At future round about locations, similar materials and treatments will be used to provide a continuous design aesthetic for all corridors. Concrete pavement and brick paver bands will be used at the intersections to provide enlarged pedestrian areas of refuge. Concrete and pavers will also be used in the wider pedestrian cross walks to accommodate pedestrian traffic.

Median plantings are incorporated in two different ways. Ornamental trees spaced in irregular groves of three to four trees along with native shrubs and perennials will be used in the approach to the roundabout, while masses of shrubs and perennials will be used at the termination of the median. The center of the roundabout will be planted with evergreen shrubs, ornamental grasses and native perennials. The planting choices will also provide seasonal interest and will visually compliment the gateway lantern that is proposed for the center. The center island also features a mountable curb and additional pavement to protect the landscaped area.

The gateway lantern reinforces the presence of the roundabout and provides a vertical cue that traffic must move around the center island, and further reinforces the visual identity of the corridor. The gateway lantern island is unique to Westfield and creates a signature design element that sets the roadway apart from those in neighboring communities. Additional ornamental trees are not proposed for the roundabout intersections to ensure safe sight distances. Existing vegetation will also be removed as needed outside of the pedestrian sidewalk to ensure appropriate sight distances are met in the area. Roundabout intersection treatments, illustrated in Figures 2-36 and 2-37, are recommended at the following intersections:

- ◆ Oak Ridge Road and 199th Street
- ◆ Oak Ridge Road and 181st Street
- ◆ Oak Ridge Road and 169th Street
- ◆ Oak Ridge Road and 156th Street
- ◆ Grassy Branch Road and 196th Street
- ◆ Grassy Branch Road and 186th Street
- ◆ Carey Road and 169th Street
- ◆ Carey Road and 151st Street



Figure 4-17: Typical plan view of the roundabout intersection treatment. Labeled drawings can be found in Section 2.



Figure 4-18: In several locations a roundabout intersection is a suitable substitute for a signalized intersection. The locations shown are proposed locations for a typical roundabout treatment.

CORRIDOR INTERSECTION ENHANCEMENTS



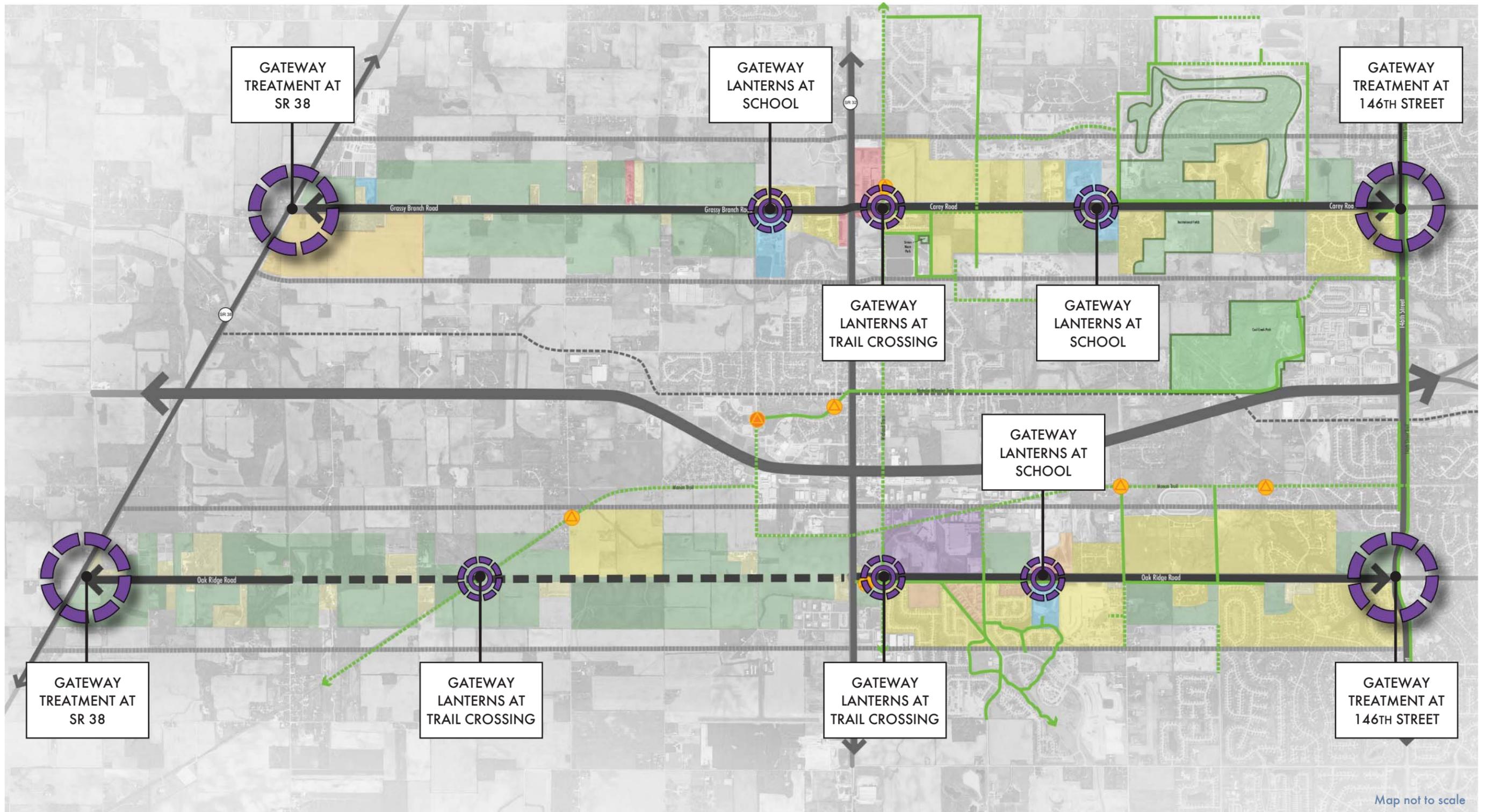


Figure 4-19: In order to compliment the community gateway being installed at SR 32 and Gray Road, four additional gateways have been located. Additional structures have also been placed at areas of specific interest such as, trail crossings and elementary schools.

CORRIDOR GATEWAY TREATMENTS



GATEWAY TREATMENTS

Gateway monuments have been developed as signature design elements for the corridors. As one of the single most important features for creating a memorable impression for those who travel its path, gateway features will set the corridors apart from others in neighboring communities. The gateway lanterns are used to create a unifying theme for the corridors as well as the entire community. Currently, the Town of Westfield is installing a city gateway at the intersection of SR 32 and Gray Road, which will be constructed of brick and limestone and incorporates the lantern symbology. The same materials and shapes were used when designing the gateway lanterns for the corridors master plan. Like other major design enhancements, the symbols were abstracted, creating a very contemporary design that is still suggestive of the community's historic and cultural roots. The intent is not that these lanterns become the official gateway for the community, but that they provide one more repeated icon that connects to the new overall identity being created for Westfield.

The lantern structure, illustrated in Figure 2-38, consists of a two foot limestone base, and a ten foot brick column. The brick column showcases both running bond and soldier coarse patterns that mimic the community gateway currently being constructed. At the top of the lantern, a three foot section of paned glass allows the lantern to cast a subtle glow. The top of the lantern is a metal panel. While the lantern will cast a subtle glow, it is not intended to provide adequate light for the roadway or the pedestrian nodes. Because of these specifications, the lantern will not cast unneeded light to areas developments or residential areas. The gateway lantern locations are shown in Figure 4-19.

The gateway lantern, illustrated in Figure 2-39 and 2-40, is located at the following intersections:

- ◆ Oak Ridge Road and SR 38
- ◆ Oak Ridge Road and 146th Street
- ◆ Grassy Branch Road and SR 38
- ◆ Carey Road and 146th Street

The gateway lantern is also located a key locations along the corridor to further enhance the visual aesthetic of the area. Those locations are listed below:

- ◆ Monon Trail Crossing
- ◆ Midland Trace Trail Crossing
- ◆ Washington Woods Elementary
- ◆ Carey Ridge Elementary School
- ◆ Oak Trace Elementary School

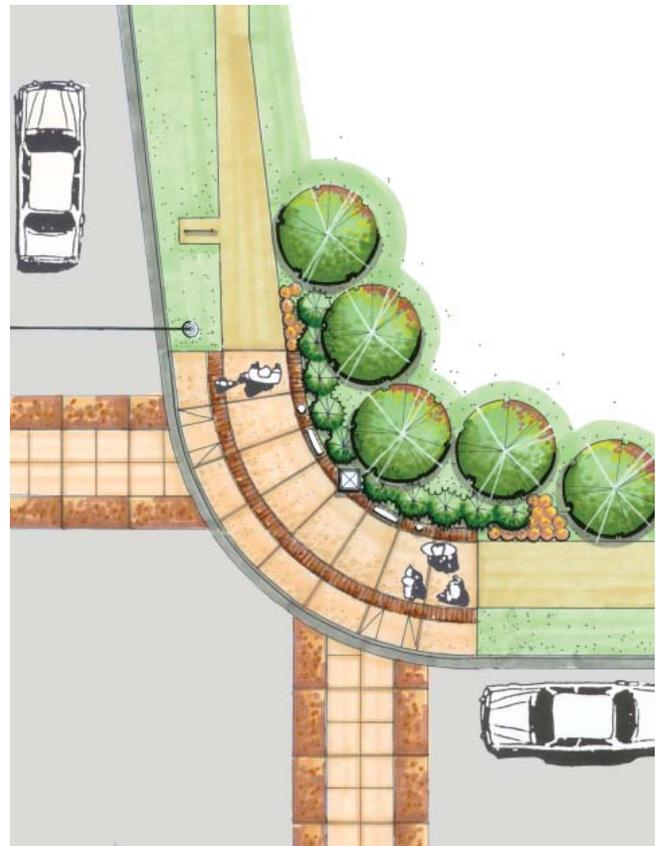
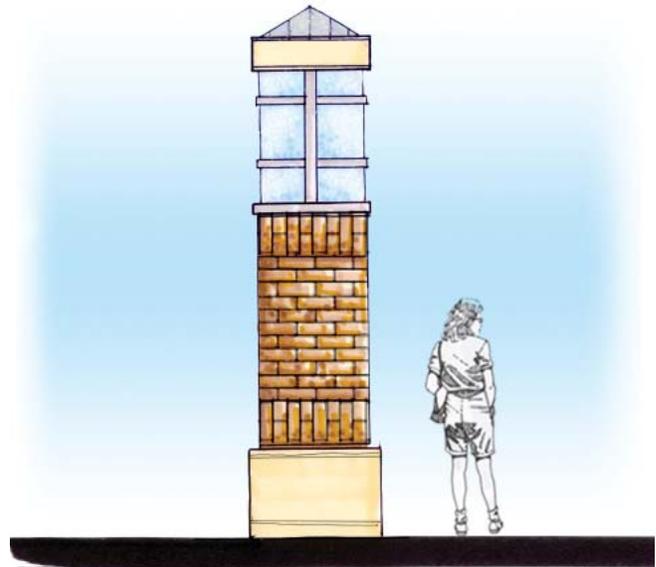


Figure 4-20: Typical elevation and plan view of the gateway lantern structure and the intersection treatment. Labeled drawings can be found in Section 2.

WAYFINDING SIGNAGE

Wayfinding signage is an important streetscape amenity that serves as an information tool and a unifying element. Wayfinding signs allow corridor users to find attractions and destinations with minimal confusion. The wayfinding system developed for the corridors relies on directional information and graphics to present a hierarchy of information and to highlight the special attributes of the corridors and the community.

The system is comprised of freestanding vehicular and pedestrian directional wayfinding signs. Not only do the wayfinding signs and street signs enhance the image of the corridors as a destination, but they help to organize destinations and attractions by providing people with directional information for local facilities. The wayfinding signs developed for the Westfield corridors play a critical role in making a strong and memorable impression to all who travel the corridor. The wayfinding signs are simple in their design and consist of a large sign panel with local destinations and large block arrows. Atop the sign panel is an area for a district or town logo. Vehicular and pedestrian wayfinding sign concepts are illustrated in Figure 2-41 and 2-42.

Vehicular wayfinding signs, shown in Figure 4-22 are located at all primary intersections along the corridors including:

- ◆ Oak Ridge Road and SR 38
- ◆ Oak Ridge Road and 206th Street
- ◆ Oak Ridge Road and 191st Street
- ◆ Oak Ridge Road and SR 32
- ◆ Oak Ridge Road and 161st Street
- ◆ Oak Ridge Road and 146th Street
- ◆ Grassy Branch Road and SR 38
- ◆ Grassy Branch Road and 191st Street
- ◆ Grassy Branch Road and SR 32
- ◆ Carey Road and 161st Street
- ◆ Carey Road and 146th Street

Pedestrian wayfinding signages, shown in Figure 4-22 are located at the gateway intersections, regional and local trailheads including the following:

- ◆ Oak Ridge Road and SR 38
- ◆ Oak Ridge Road and the Monon Trail Head
- ◆ Oak Ridge Road and the Midland Trace Trail Head
- ◆ Oak Ridge Road and 169th Street
- ◆ Oak Ridge Road and 156th Street
- ◆ Oak Ridge Road and 146th Street
- ◆ Grassy Branch Road and SR 38
- ◆ Carey Road and Midland Trace Trail Head
- ◆ Carey Road and 169th Street
- ◆ Carey Road and 146th Street

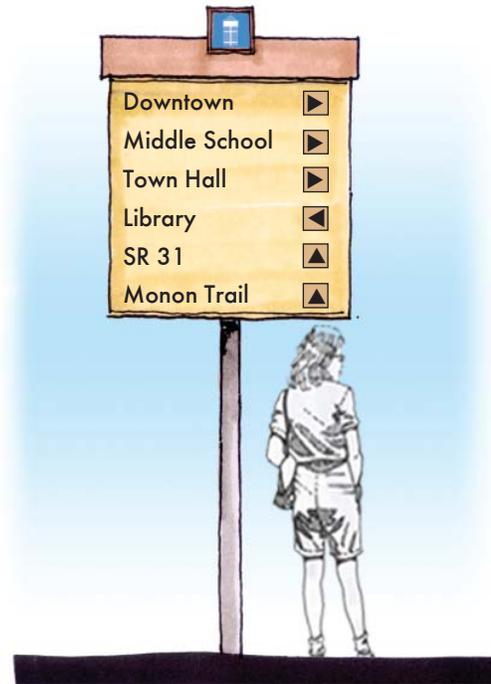


Figure 4-21: Typical elevation of vehicular and pedestrian wayfinding signs. Labeled drawings can be found in Section 2.

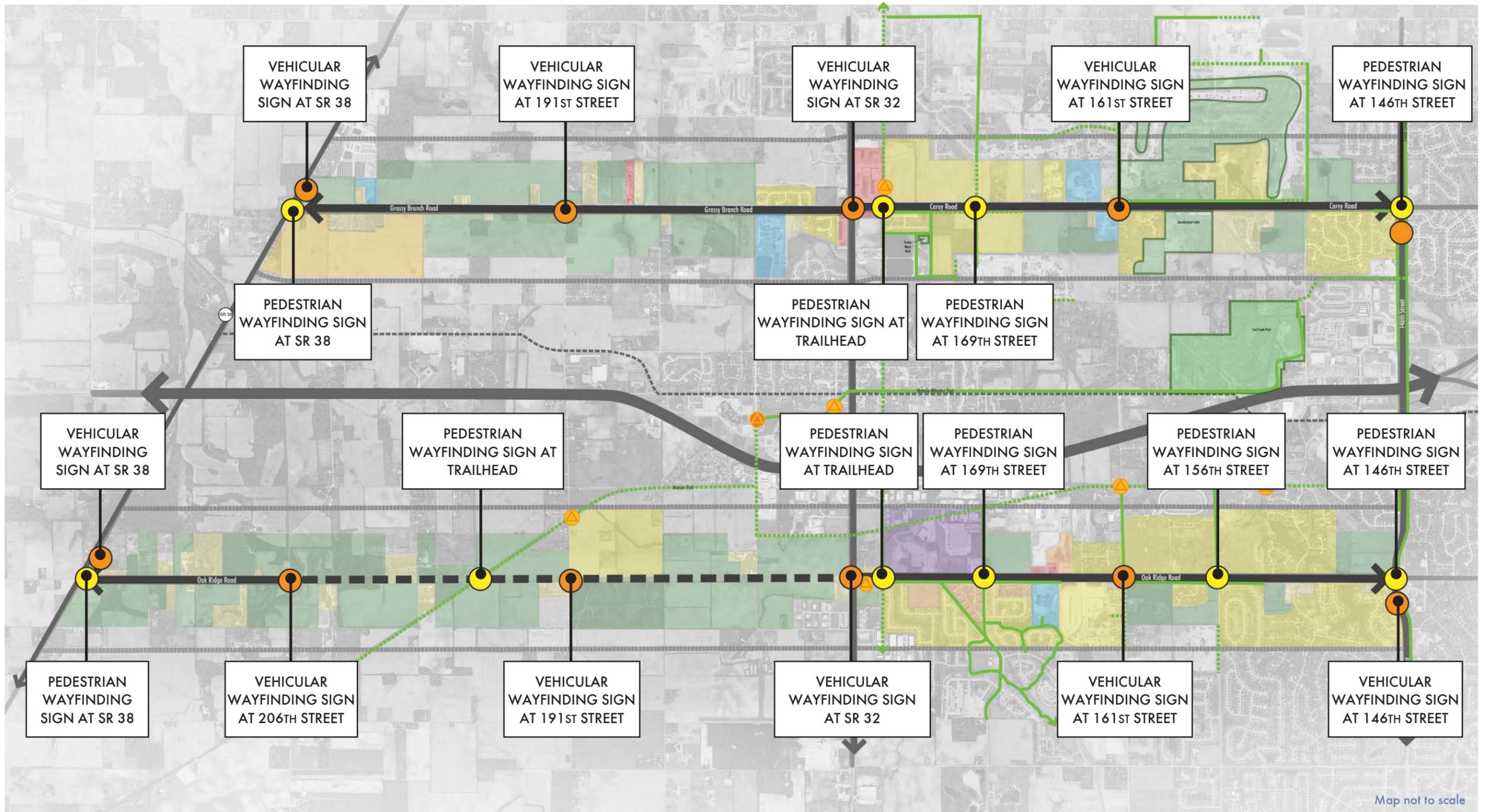


Figure 4-22: Vehicular and pedestrian wayfinding signage is being placed along the corridor to further unify the community. Vehicular wayfinding signs are being placed at primary intersections, while pedestrian signage is located at gateway intersections and trailheads.

CORRIDOR SIGNAGE AND ORNAMENTATION



CONCEPTUAL COST ESTIMATE

The enhancement portion of the project has established a long-range vision for how the enhancements can be used to create a new front door to the community, and further define the access management mechanisms being designed for the corridor. The build out of these two prototypical corridor applications is illustrated in Figure 4-7. The concept plan was developed to the level of treatment determined during the programming session held with the steering committee members, and illustrated the enhancement applications determined appropriate for the corridors.

Using the concept plan and prototypical applications along these two corridors, conceptual cost ranges were developed for enhancement treatments. Since this project dealt with typical applications along two model corridors, the costs were determined based on each enhancement application. The facing page shows the breakdown of conceptual costs for each corridor enhancement. By using the concept plan, cost ranges were determined for each corridor. It should be noted that these enhancements are general in nature and further design will need to be done to determine specific dimensions and construction needs.

In addition to understanding what is included in the cost estimate, it is important to note how the estimate is organized and what enhancement items are not included in the cost estimate. Please note the following:

- ◆ The estimate is broken into parts: individual enhancements, and average costs for each corridor.
- ◆ Roadway improvements are not included in the enhancement estimate.
- ◆ Specific infrastructure improvements that are essential to the roadway and the project goals are not included in the enhancement estimate, even though several of these items were included under the “enhancement” banner. Sidewalks, pavement markings, and curbs are not included in the estimates and would need to be included in the estimates for the overall road. The enhancement cost estimate includes only those items that enhance the roadway (for example, the decorative pavement and plantings in the median, but not the curb or median itself).
- ◆ Irrigation is not anticipated for the plantings at this time and has not been included in the estimate.
- ◆ Seeding, sodding and mulch is not included as part of this cost estimate.
- ◆ Right-of-way enhancements specific to the redevelopment sites are not included in the enhancement estimate.
- ◆ Project studies, special environmental considerations, utility relocation and significant grading requirements have not been specifically considered.
- ◆ Final design fees are not included in this estimate.
- ◆ All costs listed in the estimate are based on 2006 construction costs. As the build out of each corridor proceeds, revision to the cost estimate will need to be made to account for yearly inflation and adjustment in material costs.

Many factors may affect the eventual final cost of the enhancements; timing of construction, phasing, range of enhancements included in specific projects, all may influence the cost of enhancements at the time of construction. In addition, the continual fluctuation in the rising cost of construction materials may ultimately create variations in the cost required for enhancement construction. Further evaluation will be required during a design development and preliminary engineering stage of the project to refine the cost range.

INDIVIDUAL CORRIDOR ENHANCEMENT COSTS

MEDIAN PLANTING TREATMENT-ORNAMENTAL

Priced per planting location. Includes 50, three gallon perennials, 14 three gallon evergreen shrubs and 31, three gallon deciduous shrubs.

\$2,650 /UNIT

CORRIDOR PLANTING TREATMENT

Priced per treatment. Treatment occurs approximately every 1,000 feet. Typical corridor plantings treatments consist of irregular masses of approximately 50 shade trees, approximately 2.5" cal. and 10 ornamental tree, approximately 10' in height.

\$29,250 /PLANTING TREATMENT

LOCAL TRAIL CROSSING

Typical local trail crossing treatments consist of standard concrete pavement, colored brick paver bands, 3 gateway lantern structures, pedestrian amenities and pedestrian wayfinding signs. Electrical service, conduit and other items necessary for the lighting of the lantern is not included. Evergreen shrubs are also included.

\$55,360 / EACH CROSSING

REGIONAL TRAIL CROSSING

Typical regional trail crossing treatments consist of standard concrete pavement, colored brick paver bands, widened pedestrian crosswalks using concrete and brick pavers, 3 gateway lantern structures, pedestrian amenities and pedestrian wayfinding signage. Electrical service, conduit and other items necessary for the lighting of the lantern is not included. Ornamental plantings are also included.

\$71,220 /EACH CROSSING

GATEWAY INTERSECTION TREATMENT

Typical gateway intersection treatments consists of standard concrete pavement, colored brick paver bands, wider pedestrian crosswalks using concrete and brick pavers, vehicular wayfinding signage, 4 decorative signal poles with pedestrian signals, 2 gateway lantern structure, and ornamental plantings are also included. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.

\$199,796 /EACH INTERSECTION

PRIMARY INTERSECTION TREATMENT

Primary intersection treatments consists of standard concrete pavement, colored brick paver bands, widened pedestrian cross walks using concrete and brick pavers, vehicular wayfinding signage and 4 decorative signal poles with pedestrian signals and ornamental plantings. Cost does not include vehicular regulatory devices such as traffic signals or other control devices specific to the roadway function.

\$132,735 /EACH INTERSECTION

SECONDARY INTERSECTION TREATMENT

Secondary intersection treatments consists of standard concrete pavement, wider pedestrian cross walks using white thermoplastic striping, vehicular wayfinding signage, and ornamental plantings. Cost does not include vehicular regulatory devices such as stop signs or other control devices specific to the roadway function.

\$35,320 /EACH INTERSECTION

ROUNDBOUT INTERSECTION TREATMENT

Typical roundabout intersection treatments consist of standard concrete pavement with colored brick paver bands, additional pavement in the center island, ornamental plantings within the island and medians, and 1 gateway lantern structure. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.

\$154,260 /EACH ROUNDABOUT

ORNAMENTAL LIGHT POLE AND FIXTURE

Typical ornamental light poles and fixtures consist of the decorative base, pole and fixture arm, and the decorative fixture. All surfaces are to be powdercoated. Cost does not include electrical service, conduit and other items necessary for the lighting of the pole.

\$8,000 /EACH POLE

CUSTOM BANNER

Cost for 1 custom banner and attachment bracket.

\$600 /EACH BANNER

GATEWAY LANTERN STRUCTURE

Cost for typical lantern treatment. Includes 3 gateway lantern structures. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.

\$30,000 /EACH TREATMENT

AVERAGE CORRIDOR COSTS: OAK RIDGE ROAD

GATEWAY INTERSECTION TREATMENT @ 146TH STREET	\$199,796.00
<i>Typical gateway intersection treatments consists of standard concrete pavement, colored brick paver bands, wider pedestrian crosswalks using concrete and brick pavers, vehicular wayfinding signage, 4 decorative signal poles with pedestrian signals, 2 gateway lantern structure, and ornamental plantings are also included. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.</i>	
SECONDARY INTERSECTION TREATMENT@ 156TH STREET	\$35,320.00
<i>Secondary intersection treatments consists of standard concrete pavement, wider pedestrian cross walks using white thermoplastic striping, vehicular wayfinding signage, and ornamental plantings. Cost does not include vehicular regulatory devices such as stop signs or other control devices specific to the roadway function.</i>	
LOCAL TRAIL CROSSING @ 156TH STREET	\$55,360.00
<i>Typical local trail crossing treatments consist of standard concrete pavement, colored brick paver bands, 3 gateway lantern structures, pedestrian amenities and pedestrian wayfinding signs. Electrical service, conduit and other items necessary for the lighting of the lantern is not included. Evergreen shrubs are also included.</i>	
PRIMARY INTERSECTION TREATMENT@ 161ST STREET	\$132,735.00
<i>Primary intersection treatments consists of standard concrete pavement, colored brick paver bands, widened pedestrian cross walks using concrete and brick pavers, vehicular wayfinding signage and 4 decorative signal poles with pedestrian signals and ornamental plantings. Cost does not include vehicular regulatory devices such as traffic signals or other control devices specific to the roadway function.</i>	
GATEWAY LANTERN LOCATION @ SCHOOL	\$30,000.00
<i>Cost for typical lantern treatment. Includes 3 gateway lantern structures. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.</i>	
SECONDARY INTERSECTION TREATMENT@ 169TH STREET	\$35,320.00
<i>Secondary intersection treatments consists of standard concrete pavement, wider pedestrian cross walks using white thermoplastic striping, vehicular wayfinding signage, and ornamental plantings. Cost does not include vehicular regulatory devices such as stop signs or other control devices specific to the roadway function.</i>	
LOCAL TRAIL CROSSING @ 169TH STREET	\$55,360.00
<i>Typical local trail crossing treatments consist of standard concrete pavement, colored brick paver bands, 3 gateway lantern structures, pedestrian amenities and pedestrian wayfinding signs. Electrical service, conduit and other items necessary for the lighting of the lantern is not included. Evergreen shrubs are also included.</i>	
REGIONAL TRAIL CROSSING @ MIDLAND TRACE TRAIL CROSSING	\$71,220.00
<i>Typical regional trail crossing treatments consist of standard concrete pavement, colored brick paver bands, widened pedestrian crosswalks using concrete and brick pavers, 3 gateway lantern structures, pedestrian amenities and pedestrian wayfinding signage. Electrical service, conduit and other items necessary for the lighting of the lantern is not included. Ornamental plantings are also included.</i>	
PRIMARY INTERSECTION TREATMENT@ STATE ROAD 32	\$132,735.00
<i>Primary intersection treatments consists of standard concrete pavement, colored brick paver bands, widened pedestrian cross walks using concrete and brick pavers, vehicular wayfinding signage and 4 decorative signal poles with pedestrian signals and ornamental plantings. Cost does not include vehicular regulatory devices such as traffic signals or other control devices specific to the roadway function.</i>	
SECONDARY INTERSECTION TREATMENT @ 181ST STREET	\$35,320.00
<i>Secondary intersection treatments consists of standard concrete pavement, wider pedestrian cross walks using white thermoplastic striping, vehicular wayfinding signage, and ornamental plantings. Cost does not include vehicular regulatory devices such as stop signs or other control devices specific to the roadway function.</i>	
SECONDARY INTERSECTION TREATMENT @ 186TH STREET	\$35,320.00
<i>Secondary intersection treatments consists of standard concrete pavement, wider pedestrian cross walks using white thermoplastic striping, vehicular wayfinding signage, and ornamental plantings. Cost does not include vehicular regulatory devices such as stop signs or other control devices specific to the roadway function.</i>	

	ENHANCEMENTS COSTS
PRIMARY INTERSECTION TREATMENT@ 191ST STREET	\$132,735.00
<i>Primary intersection treatments consists of standard concrete pavement, colored brick paver bands, widened pedestrian cross walks using concrete and brick pavers, vehicular wayfinding signage and 4 decorative signal poles with pedestrian signals and ornamental plantings. Cost does not include vehicular regulatory devices such as traffic signals or other control devices specific to the roadway function.</i>	
REGIONAL TRAIL CROSSING @ MONON GREENWAY CROSSING	\$71,220.00
<i>Typical regional trail crossing treatments consist of standard concrete pavement, colored brick paver bands, widened pedestrian crosswalks using concrete and brick pavers, 3 gateway lantern structures, pedestrian amenities and pedestrian wayfinding signage. Electrical service, conduit and other items necessary for the lighting of the lantern is not included. Ornamental plantings are also included.</i>	
PRIMARY INTERSECTION TREATMENT@ 206TH STREET	\$132,735.00
<i>Primary intersection treatments consists of standard concrete pavement, colored brick paver bands, widened pedestrian cross walks using concrete and brick pavers, vehicular wayfinding signage and 4 decorative signal poles with pedestrian signals and ornamental plantings. Cost does not include vehicular regulatory devices such as traffic signals or other control devices specific to the roadway function.</i>	
GATEWAY INTERSECTION TREATMENT @ 146TH STREET	\$199,796.00
<i>Typical gateway intersection treatments consists of standard concrete pavement, colored brick paver bands, wider pedestrian crosswalks using concrete and brick pavers, vehicular wayfinding signage, 4 decorative signal poles with pedestrian signals, 2 gateway lantern structure, and ornamental plantings are also included. Electrical service, conduit and other items necessary for the lighting of the lantern is not included. Cost does not include vehicular regulatory devices such as traffic signals or other control devices specific to the roadway function.</i>	
ORNAMENTAL LIGHT POLE AND FIXTURE	\$4,060,000.00
<i>Typical ornamental light poles and fixtures consist of the decorative base, pole and fixture arm, and the decorative fixture. All surfaces are to be powdercoated. Banners are located on every fifth pole.</i>	
MEDIAN PLANTING TREATMENT-ORNAMENTAL	\$47,700.00
<i>Priced per planting location. Includes 50, three gallon perennials, 14 three gallon evergreen shrubs and 31, three gallon deciduous shrubs. Cost is figured based on 1 treatment every 2,000 L.F.</i>	
CORRIDOR PLANTING TREATMENT	\$877,500.00
<i>Priced per treatment. Treatment occurs approximately every 1,000 feet. Typical corridor plantings treatments consist of irregular masses of approximately 50 shade trees, approximately 2.5" cal. and 10 ornamental tree, approximately 10' in height.</i>	
TOTAL ENHANCEMENT COSTS-OAK RIDGE ROAD	\$6,340,172.00

AVERAGE CORRIDOR COSTS: CAREY/GRASSY BRANCH ROAD

GATEWAY INTERSECTION TREATMENT @ 146TH STREET	\$199,796.00
<i>Typical gateway intersection treatments consists of standard concrete pavement, colored brick paver bands, wider pedestrian crosswalks using concrete and brick pavers, vehicular wayfinding signage, 4 decorative signal poles with pedestrian signals, 2 gateway lantern structure, and ornamental plantings are also included. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.</i>	
SECONDARY INTERSECTION TREATMENT@ 151ST STREET	\$35,320.00
<i>Secondary intersection treatments consists of standard concrete pavement, wider pedestrian cross walks using white thermoplastic striping, vehicular wayfinding signage, and ornamental plantings. Cost does not include vehicular regulatory devices such as stop signs or other control devices specific to the roadway function.</i>	
GATEWAY LANTERN LOCATION @ HABIG FIELDS	\$30,000.00
<i>Cost for typical lantern treatment. Includes 3 gateway lantern structures. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.</i>	
PRIMARY INTERSECTION TREATMENT@ 161ST STREET	\$132,735.00
<i>Primary intersection treatments consists of standard concrete pavement, colored brick paver bands, widened pedestrian cross walks using concrete and brick pavers, vehicular wayfinding signage and 4 decorative signal poles with pedestrian signals and ornamental plantings. Cost does not include vehicular regulatory devices such as traffic signals or other control devices specific to the roadway function.</i>	
GATEWAY LANTERN LOCATION @ SCHOOL	\$30,000.00
<i>Cost for typical lantern treatment. Includes 3 gateway lantern structures. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.</i>	
LOCAL TRAIL CROSSING @ 169TH STREET	\$55,360.00
<i>Typical local trail crossing treatments consist of standard concrete pavement, colored brick paver bands, 3 gateway lantern structures, pedestrian amenities and pedestrian wayfinding signs. Electrical service, conduit and other items necessary for the lighting of the lantern is not included. Evergreen shrubs are also included.</i>	
SECONDARY INTERSECTION TREATMENT@ 169TH STREET	\$35,320.00
<i>Secondary intersection treatments consists of standard concrete pavement, wider pedestrian cross walks using white thermoplastic striping, vehicular wayfinding signage, and ornamental plantings. Cost does not include vehicular regulatory devices such as stop signs or other control devices specific to the roadway function.</i>	
REGIONAL TRAIL CROSSING @ MIDLAND TRACE TRAIL CROSSING	\$71,220.00
<i>Typical regional trail crossing treatments consist of standard concrete pavement, colored brick paver bands, widened pedestrian crosswalks using concrete and brick pavers, 3 gateway lantern structures, pedestrian amenities and pedestrian wayfinding signage. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.</i>	
PRIMARY INTERSECTION TREATMENT@ STATE ROAD 32	\$132,735.00
<i>Primary intersection treatments consists of standard concrete pavement, colored brick paver bands, widened pedestrian cross walks using concrete and brick pavers, vehicular wayfinding signage and 4 decorative signal poles with pedestrian signals and ornamental plantings. Cost does not include vehicular regulatory devices such as traffic signals or other control devices specific to the roadway function.</i>	
GATEWAY LANTERN LOCATION @ SCHOOL	\$30,000.00
<i>Cost for typical lantern treatment. Includes 3 gateway lantern structures. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.</i>	
SECONDARY INTERSECTION TREATMENT @ 181ST STREET	\$35,320.00
<i>Secondary intersection treatments consists of standard concrete pavement, wider pedestrian cross walks using white thermoplastic striping, vehicular wayfinding signage, and ornamental plantings. Cost does not include vehicular regulatory devices such as stop signs or other control devices specific to the roadway function.</i>	
SECONDARY INTERSECTION TREATMENT @ 186TH STREET	\$35,320.00
<i>Secondary intersection treatments consists of standard concrete pavement, wider pedestrian cross walks using white thermoplastic striping, vehicular wayfinding signage, and ornamental plantings. Cost does not include vehicular regulatory devices such as stop signs or other control devices specific to the roadway function.</i>	

PRIMARY INTERSECTION TREATMENT@ 191ST STREET	\$132,735.00
<i>Primary intersection treatments consists of standard concrete pavement, colored brick paver bands, widened pedestrian cross walks using concrete and brick pavers, vehicular wayfinding signage and 4 decorative signal poles with pedestrian signals and ornamental plantings. Cost does not include vehicular regulatory devices such as traffic signals or other control devices specific to the roadway function.</i>	
GATEWAY INTERSECTION TREATMENT @ SR38	\$199,796.00
<i>Typical gateway intersection treatments consists of standard concrete pavement, colored brick paver bands, wider pedestrian crosswalks using concrete and brick pavers, vehicular wayfinding signage, 4 decorative signal poles with pedestrian signals, 2 gateway lantern structure, and ornamental plantings are also included. Electrical service, conduit and other items necessary for the lighting of the lantern is not included.</i>	
ORNAMENTAL LIGHT POLE AND FIXTURE	\$3,248,000.00
<i>Typical ornamental light poles and fixtures consist of the decorative base, pole and fixture arm, and the decorative fixture. All surfaces are to be powdercoated. Cost does not include electrical service, conduit and other items necessary for the lighting of the pole.</i>	
MEDIAN PLANTING TREATMENT-ORNAMENTAL	\$39,750.00
<i>Priced per planting location. Includes 50, three gallon perennials, 14 three gallon evergreen shrubs and 31, three gallon deciduous shrubs. Cost is figured based on a treatment every 2,000 L.F.</i>	
CORRIDOR PLANTING TREATMENT	\$877,500.00
<i>Priced per treatment. Treatment occurs approximately every 1,000 feet. Typical corridor plantings treatments consist of irregular masses of approximately 50 shade trees, approximately 2.5" cal. and 10 ornamental tree, approximately 10' in height.</i>	
TOTAL ENHANCEMENT COSTS-CAREY/GRASSY BRANCH ROAD	\$5,320,907.00

5

DOCUMENT APPENDICES



A APPENDIX 'A'

STEERING COMMITTEE INPUT EXERCISE

Appendix 'A' consists of the survey exercise that was completed at the beginning of the input process. This exercise was meant to actively engage the steering committee and encourage them to think conceptually about the corridor master plan process. The responses gathered during this exercise are summarized on the pages that follow.

STEERING COMMITTEE EXERCISES

The purpose of this exercise is to begin the input process for the steering committee. These exercises are intended to get the steering committee thinking more conceptually about the project, the streets, and the design opportunities we have as part of this master plan process. The responses from this initial exercise will assist the design team in the development of the goals and objectives for the project, and pieces of the data received may influence the direction of future components of the plan. Your contribution to these exercises is important and appreciated.

PART 1: STEERING COMMITTEE SURVEY COMMUNITY CHARACTER

1. If you were describing Westfield to a friend or family member that had never been here before, how would you describe the community?

- Progressive	- Excellent schools
- Family oriented	- Good shopping/ restaurants
- Save	- Suburban sprawl
- Raise a family	- Some open space/ farm fields
- Bedroom community	- Equestrian/ picturesque
- Higher income (in general)	

2. In your description, would you describe the town as more historic or contemporary? Using a scale of 1 to 10, with 1 being "historic" and 10 being "contemporary," where would you rate Westfield? _____ Why?

- Quaker roots
- Underground Railroad stop
- Founding date - 1834
- 19,000 of the 25,000 people have only been here since 1995
- 4 historic villages

3. In your description, would you describe the town as more progressive or conservative? Using a scale of 1 to 10, with 1 being "progressive" and 10 being "conservative," where would you rate Westfield? _____ Why?

- NIMBY - but support growth
- Starting to change
- Majority is progressive on how development should occur but some are afraid of changes; this causes control issues

4. Think of the last place you went on vacation. What are the things that stand out about that place that made it special?

- Location	- Walkability
- New urbanist town	- Visual mystery
- American history	- Activities
- Diversity	- Sense of character
- Tolerance	- Community gathering places

5. If you had to pick a symbol that best represents the character of Westfield, what would it be and why?

- Housing
- Suburbia
- Town seal/ logo
- Lantern (Underground Railroad)

6. What sets Westfield apart from other nearby communities such as Carmel, Noblesville, Zionsville or Indianapolis?

- Quaker heritage
- Underground Railroad
- Many rural areas
- Good schools
- Small town feel/ smaller in scale
- Less traffic
- Smaller focal points
- Need to improve "old downtown" and community identity

7. Why do people live in Westfield?

- Close to Indianapolis/ highways
- Affordable housing
- Great school system
- Born here
- Everything/ everyone looks alike
- Retire and want rural atmosphere
- "They don't know they are"
- "I've got mine and I can keep others out"

8. What are the "quality of life" indicators that you feel are important to the community?

- Recreation/ open space
- Trails/ parks
- Good school system
- Property taxes
- Additional commercial development
- Managed growth
- Shopping
- Rural feel
- Many different churches
- Sports organizations that draw families
- Diversity
- Activity
- Inclusion
- Cultural

9. Please provide true or false answers to the following statements concerning Westfield's *community character*.

I TRUE III FALSE: Westfield has a unique identity and a sense of community.

II TRUE II FALSE: Despite suburban growth, Westfield is a rural community and any enhancements should play up that rural character.

III TRUE I FALSE: Despite suburban growth, Westfield is small town and any enhancements or design statements should play up the small town character.

II TRUE II FALSE: Westfield is part of the greater Indianapolis Metropolitan area, and the character of design elements should be consistent with Indianapolis' design standards and those of other surrounding communities.

STREET AND TRAFFIC CHARACTER

10. When driving around Westfield or the surrounding communities, what is your biggest frustration--- one you would want to avoid in the development of this corridor?

- | | |
|--|--|
| - Not enough N/S & E/W primary and secondary arterials | - Traffic flow (including blind corners and speeding) |
| - Realignment of intersections | - Lack of mass transit |
| - Widening of roads | - Diversity |
| - Houses with "backs" to roads | - "Make the roads like Hazel Dell or Spring Mill at 146th" |

11. Are there streets in Westfield or in the surrounding communities that you believe would be a good example of what should be done with these road corridors in Westfield? Why?

- | | |
|--|---|
| - Spring Mill, Ditch, Oak Ridge, Grassy Branch | - Hazel Dell Parkway and Spring Mill - warmer/natural feeling and good traffic flow |
| - will reduce flow on other major roads | |
| - Ridgeline | |

12. Which of the following do you see as important functions of these two street corridors? (Check all that apply)

- | | | |
|---|---------------------------------------|-----------------------------|
| <u>II</u> Regional thoroughfare | <u>II</u> Pedestrian corridor | <u>II</u> Utility corridor |
| <u>III</u> Local traffic connection | <u>III</u> Pedestrian link to trails | <u>I</u> Growth accelerator |
| <u>II</u> Neighborhood collector | <u>II</u> North-south pedestrian link | <u>II</u> Green space |
| <u>III</u> US 31 bypass/shortcut | <u>II</u> Gateways to Westfield | |
| <u>III</u> Major north-south connectors | <u>II</u> Community identifier | |

13. Based on your assessment above, please rank the level of importance of each of these factors in the master plan. Please mark each as either **V** for "Very important", **N** for "Not Important," or **U** for "Unsure or Neutral Importance."

- | | | |
|--|---|--------------------------------|
| <u>V(2)N(1)</u> Regional thoroughfare | <u>V(1)U(2)</u> Pedestrian corridor | <u>V(2)</u> Utility corridor |
| <u>V(4)</u> Local traffic connection | <u>V(2)U(2)</u> Pedestrian link to trails | <u>V(2)</u> Growth accelerator |
| <u>V(2)</u> Neighborhood collector | <u>V(1)U(2)</u> North-south pedestrian link | <u>V(2)</u> Green space |
| <u>V(3)</u> US 31 bypass/shortcut | <u>V(2)N(1)</u> Gateways to Westfield | |
| <u>V(2)U(2)</u> Major north-south connectors | <u>V(2)N(1)</u> Community identifier | |

14. Who will use these corridors?

- | | |
|----------------------------------|----------|
| - Local neighborhoods/ residents | - Trucks |
| - Surrounding communities | |
| - Westfield, Noblesville, Carmel | |

15. What is your general impression of the Oak Ridge Road Corridor?

- | | |
|-------------------------------------|----------------------------|
| - Great potential | - Built for "rural" use |
| - Not sufficient for current growth | - Countryside |
| - Residential bypass | - South Park, Indianapolis |
| - Residential character | |

16. What is your general impression of the Carey Road/Grassy Branch Road Corridor?
 - Great Potential - Local/ regional bypass

 - Widening should have already been done/ behind needs

 - Rural with fast development

17. What are the general perceptions (within the community) regarding these two road Corridors?
 - Not adequate

 - "Do not tell anyone"

 - Highly traveled

18. What traffic problems do you think will be the greatest along these corridors?
 - Turns at intersections - Intersections: 146th with SR 32, Oak Ridge with 169th

 - Volume of traffic/ roundabouts should be and Carey with 166th

 considered

 - School sites

19. Please provide true or false answers to the following statements concerning Westfield's *streets and traffic issues*.

III TRUE ___ FALSE: The design of a street says much of a community's values.

___ TRUE III FALSE: The main focus of any new street standards should focus solely on vehicles.

I TRUE III FALSE: Westfield is well connected in terms of pedestrians.

II TRUE II FALSE: Congestion is a serious problem in Westfield.

III TRUE I FALSE: Access should be controlled on all new streets developed in Westfield.

III TRUE I FALSE: These corridors will likely be used by locals to bypass US 31.

DESIGN ENHANCEMENTS

20. What kind of "experience" do you think should be created within the corridor?
 - Easy to use - "Time to slow down and welcome yourself home"

 - Moves people quickly

 - Natural setting

 - Pedestrians and vehicles can safely share

 corridor

21. There are several enhancements we will be discussing as part of the project. Below is a preliminary list of some enhancements that may end up being proposed. Please check all that you would like to have considered for the corridor. In addition, strike out any you feel should NOT be considered in the plan.

- | | | |
|--|--------------------------------|------------------------------------|
| <u>III</u> Street Signage | <u>III</u> Ornamental Lighting | <u>II</u> Landscaping |
| <u>III</u> Wayfinding Signage | <u>II</u> Decorative Poles | <u>III</u> Walking Paths/Sidewalks |
| <u>II</u> Traffic Signal Upgrades | <u>I</u> Banners | <u>III</u> Bike Lanes |
| <u>III</u> Special Paving Treatment | <u>I</u> Pavement Markings | <u>I</u> Pedestrian Amenities |
| <u>II</u> Wall and Structural treatments | <u>II</u> Fences | <u>II</u> Public Art |
| <u>II</u> Gateways | | |

22. Are there additional enhancements that should be considered that are not listed?

Trail enhancements near the Midland and Monon

23. If ALL of the enhancements listed below were included in the master plan, please rank them in order of priority from 1 to 16, with 1 representing the highest priority and 16 representing the lowest.

- | | | |
|---|--------------------------------|----------------------------------|
| <u>6</u> Street Signage | <u>6.7</u> Ornamental Lighting | <u>5.7</u> Landscaping |
| <u>4</u> Wayfinding Signage | <u>7.7</u> Decorative Poles | <u>7</u> Walking Paths/Sidewalks |
| <u>4.7</u> Traffic Signal Upgrades | <u>14</u> Banners | <u>8.3</u> Bike Lanes |
| <u>6</u> Special Paving Treatment | <u>11</u> Pavement Markings | <u>8.7</u> Pedestrian Amenities |
| <u>9.3</u> Wall and Structural treatments | <u>14</u> Fences | <u>10.3</u> Public Art |
| <u>9</u> Gateways | | |

24. To what extent should corridor enhancements link/engage regional trails/park/open space systems? Desire for trailhead along the corridor?

- Trailheads should be used (esp. along the Midland)

 - Should link trails/ open space/ parks

25. Look closely at the graphics below. What do you see in the graphics that should be included in the master plan for these corridors



- | | |
|--------------------------------------|---------------------------|
| - Good landscaping | - Wide sidewalks |
| - Excellent crossing lanes/ markings | - Scale of buildings |
| - No street parking | - Limited number of lines |
| - Ornamental streetlights | -Connections |
| - Handicap access | -Gathering spot |
| -Open space | |

26. What do you see in the graphics that you would NOT want considered in the master plan?

- Nothing
- Too many lanes
- Lack of activities (retail, recreation)
- Way finding

27. Please use the space below to identify other issues, ideas, or pertinent information about the corridors that should be considered in the master plan.

- School sites
- Intersection with trails
- Highly congested intersection
- Lighting
- Open space
- Landscaping
- Parking
- Pedestrian needs

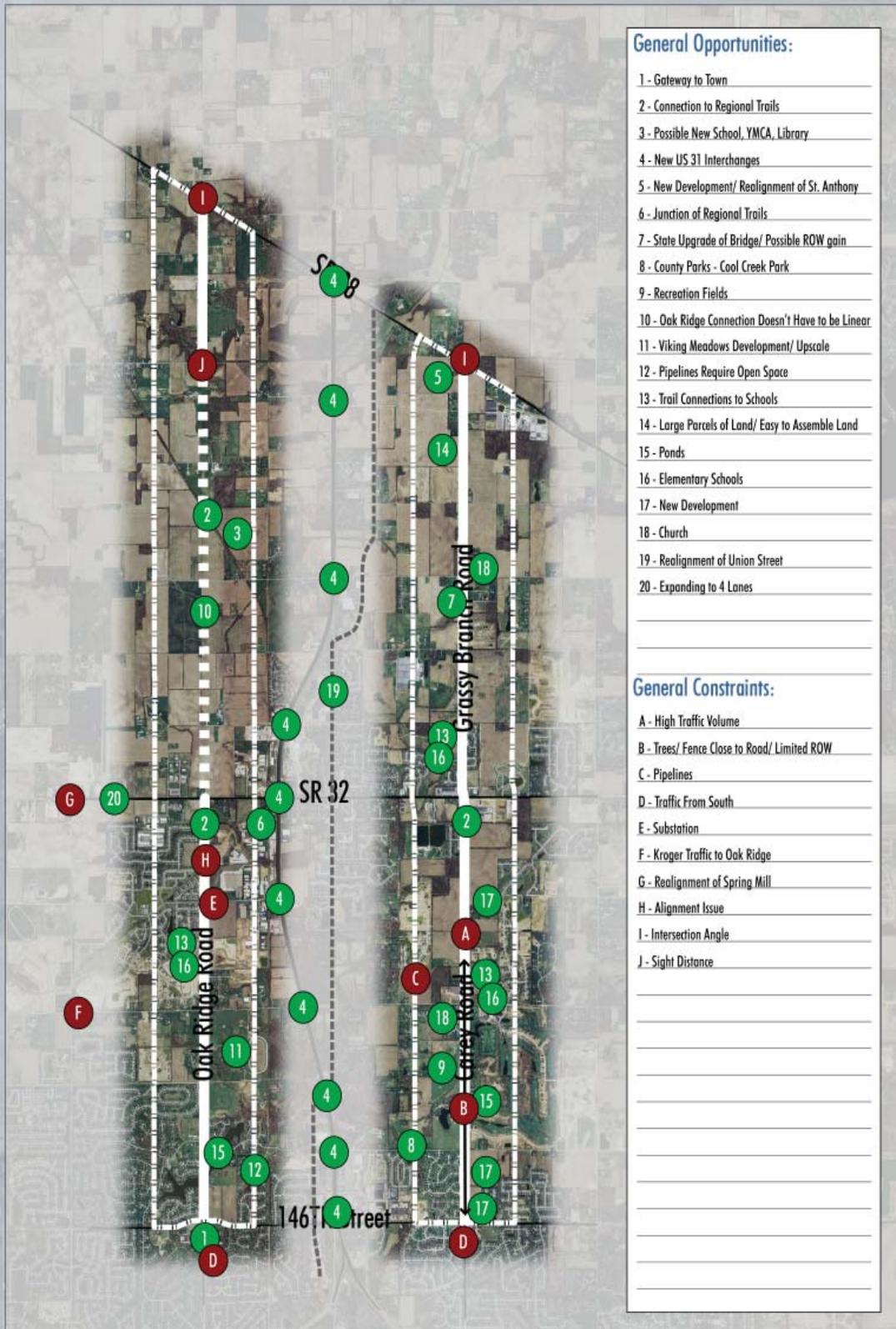
PART 2: BOARD EXERCISES

For the second part of this exercise, two stations have been set up in the room to get additional input from the steering committee. In your role as a local representative of the steering committee, you may have critical information of insight on specific issues along the corridors that isn't available from any other source. As such, you are asked to provide specific information on each board:

- One board deals with Critical Issues and Concerns along each corridor. You are asked to identify and note on the graphic those areas where you believe are critical issues and concerns that need to be dealt with in the plan. A design team member will be present at the station to assist you in identifying and noting your concerns.
- The second board deals with Opportunities along each corridor. You are asked to identify and note on the graphic those areas where you believe there are significant opportunities that can be addressed in the plan. A design team member will be present at the station to assist you in identifying and noting these key opportunities.

Thanks again for your assistance in completing this input.

Opportunities and Constraints: Please identify critical areas along the corridors.



General Opportunities:

- 1 - Gateway to Town
- 2 - Connection to Regional Trails
- 3 - Possible New School, YMCA, Library
- 4 - New US 31 Interchanges
- 5 - New Development/ Realignment of St. Anthony
- 6 - Junction of Regional Trails
- 7 - State Upgrade of Bridge/ Possible ROW gain
- 8 - County Parks - Cool Creek Park
- 9 - Recreation Fields
- 10 - Oak Ridge Connection Doesn't Have to be Linear
- 11 - Viking Meadows Development/ Upscale
- 12 - Pipelines Require Open Space
- 13 - Trail Connections to Schools
- 14 - Large Parcels of Land/ Easy to Assemble Land
- 15 - Ponds
- 16 - Elementary Schools
- 17 - New Development
- 18 - Church
- 19 - Realignment of Union Street
- 20 - Expanding to 4 Lanes

General Constraints:

- A - High Traffic Volume
- B - Trees/ Fence Close to Road/ Limited ROW
- C - Pipelines
- D - Traffic From South
- E - Substation
- F - Kroger Traffic to Oak Ridge
- G - Realignment of Spring Mill
- H - Alignment Issue
- I - Intersection Angle
- J - Sight Distance



WESTFIELD CORRIDORS MASTER PLAN

Oak Ridge and Carey/ Grassy Branch Roads



B

APPENDIX 'B'

STEERING COMMITTEE PROGRAMMING SESSION

Appendix 'B' consists of the transportation enhancement programming session that the steering committee participated in. The purpose of this exercise was to determine a level of treatment and design direction for each enhancement deemed appropriate for the corridors. The steering committee was shown a series of images ranging from a minimal treatment to a moderate treatment. The individual choices made by the steering committee members were calculated to determine the average range of treatment. The following pages depict the final choices recommended by the steering committee.

TRANSPORTATION ENHANCEMENTS

ENHANCEMENT PROGRAMMING SESSION

OBJECTIVES OF PROGRAMMING SESSION...

- Determine design direction for enhancements
- Determine level of treatment for each enhancement
- Determine the level of investment desired by the community



WESTFIELD CORRIDORS MASTER PLAN

Oak Ridge and Carey/ Grassy Branch Roads

TRANSPORTATION ENHANCEMENTS

ENHANCEMENT PROGRAMMING SESSION

A SERIES OF IMAGES WILL BE PRESENTED, AND YOU WILL BE ASKED TO INDICATE YOUR PREFERENCE FOR TREATMENT...

LEVEL OF TREATMENT...

MINIMAL  MODERATE  AGGRESSIVE



WESTFIELD CORRIDORS MASTER PLAN

Oak Ridge and Carey/ Grassy Branch Roads

TRANSPORTATION ENHANCEMENTS

PEDESTRIAN CROSSINGS

PLEASE SELECT YOUR PREFERRED LEVEL OF TREATMENT FOR PEDESTRIAN CROSSINGS...



AVERAGE RATING: 2.5

HNTB WESTFIELD CORRIDORS MASTER PLAN
Oak Ridge and Carey/ Grassy Branch Roads

TRANSPORTATION ENHANCEMENTS

SIDEWALK TREATMENTS

PLEASE SELECT YOUR PREFERRED LEVEL OF TREATMENT FOR SIDEWALK ENHANCEMENTS...



AVERAGE RATING: 1.8

HNTB WESTFIELD CORRIDORS MASTER PLAN
Oak Ridge and Carey/ Grassy Branch Roads

TRANSPORTATION ENHANCEMENTS

BICYCLE & PEDESTRIAN TREATMENTS

PLEASE SELECT YOUR PREFERRED LEVEL OF TREATMENT FOR BICYCLE & PEDESTRIAN ENHANCEMENTS...



MINIMAL MODERATE AGGRESSIVE

AVERAGE RATING: 3.08



WESTFIELD CORRIDORS MASTER PLAN
Oak Ridge and Carey/ Grassy Branch Roads

TRANSPORTATION ENHANCEMENTS

LANDSCAPE TREATMENTS

PLEASE SELECT YOUR PREFERRED LEVEL OF TREATMENT FOR LANDSCAPE ENHANCEMENTS...



MINIMAL MODERATE AGGRESSIVE

AVERAGE RATING: 2.66



WESTFIELD CORRIDORS MASTER PLAN
Oak Ridge and Carey/ Grassy Branch Roads

TRANSPORTATION ENHANCEMENTS

LIGHTING TREATMENTS

PLEASE SELECT YOUR PREFERRED LEVEL OF TREATMENT FOR LIGHTING ENHANCEMENTS...



MINIMAL

MODERATE

AGGRESSIVE

AVERAGE RATING: 3.0



WESTFIELD CORRIDORS MASTER PLAN

Oak Ridge and Carey/ Grassy Branch Roads

TRANSPORTATION ENHANCEMENTS

WAYFINDING SIGNAGE TREATMENTS

PLEASE SELECT YOUR PREFERRED LEVEL OF TREATMENT FOR WAYFINDING SIGNAGE ENHANCEMENTS...



MINIMAL

MODERATE

AGGRESSIVE

AVERAGE RATING: 2.6



WESTFIELD CORRIDORS MASTER PLAN

Oak Ridge and Carey/ Grassy Branch Roads

TRANSPORTATION ENHANCEMENTS

GATEWAY TREATMENTS

PLEASE SELECT YOUR PREFERRED LEVEL OF TREATMENT FOR GATEWAY ENHANCEMENTS...



MINIMAL → MODERATE → AGGRESSIVE

AVERAGE RATING: 2.3



WESTFIELD CORRIDORS MASTER PLAN
Oak Ridge and Carey/Grassy Branch Roads

EXISTING TRANSPORTATION CONDITIONS

BRIDGE TREATMENTS

PLEASE SELECT YOUR PREFERRED LEVEL OF TREATMENT FOR BRIDGE ENHANCEMENTS...



MINIMAL → MODERATE → AGGRESSIVE

AVERAGE RATING: 2.66



WESTFIELD CORRIDORS MASTER PLAN
Oak Ridge and Carey/Grassy Branch Roads

TRANSPORTATION ENHANCEMENTS

STRUCTURAL TREATMENTS

PLEASE SELECT YOUR PREFERRED LEVEL OF TREATMENT FOR STRUCTURAL ENHANCEMENTS...



WESTFIELD CORRIDORS MASTER PLAN
Oak Ridge and Carey/ Grassy Branch Roads

C

APPENDIX 'C'

RECOMMENDED PLANT LIST

Appendix 'C' consists of a recommended plant list for the corridor plantings within the Town of Westfield. Final plant choices will be approved by the Town of Westfield during the design phase of individual corridor projects.

RECOMMENDED PLANT MATERIALS FOR CORRIDOR

The following tree and plant species are recommended for the Town of Westfield's corridors. Final planting design will occur during a later phase and should utilize a palette of plant material from these lists:

Small Trees With Narrow Crowns

Amelanchier arborea - Shadblow Serviceberry
Amelanchier Canadensis 'Lamarcki' – Lamarcki Serviceberry
Amelanchier x grandiflora 'Robin Hill' – Robin Hill Serviceberry
Amelanchier laevis–Cumulus Serviceberry
Cornus kousa – Kousa Dogwood
Prunus sargentii 'Columnaris' –Columnar Sargent Cherry
Prunus serrulata – Oriental Cherry
Prunus virginiana 'Canada Red Select' – Canada Red Select Cherry

Small Trees With Broad Crowns

Amelanchier laevis 'Cumulus'- Cumulus Serviceberry
Carpinus caroliniana - American Hornbeam
Cercis canadensis – Eastern Redbud
Cornus florida – Flowering Dogwood
Crataegus spp.– Hawthorn Varieties*: Inermis, Vaughn, Ohio Pioneer, Crimson Cloud, Winter King, Washington
Prunus virginiana 'Shubert' - Shubert Chokecherry
Prunus 'Accolade' –Accolade Flowering Cherry
**Limit use – over planted genus*

Medium Trees

Aesculus x carnea 'Briotii' - Rubyred Horsechestnut
Betula nigra - River Birch
Carpinus betulus - European Hornbeam
Fagus sylvatica 'Purpurea Tricolor' or 'Roseo-marginata' – Tricolor Beech
Gleditsia triacanthos inermis 'Impcole' – Imperial Honeylocust
Nyssa sylvatica – Sourgum / Blackgum
Ostrya virginiana – Hophornbeam
Pyrus calleryana spp.- Pear Species
Quercus robur 'Fastigiata' - Pyramidal English Oak
Quercus robur 'Skyrocket' - Skyrocket English Oak
Tilia cordata 'Corzam' - Corinthian Littleleaf Linden
Tilia x flavescens 'Glenleven' - Glenleven Hybrid Linden

Large Trees

Acer x freemanii – Autumn Blaze Maple
Acer nigrum - Black Maple
Acer platanoides–Norway Maple
Acer rubrum – Red Maple*
Acer saccharum – Sugar Maple
Carya ovata – Shagbark Hickory
Celtis laevigata 'All Seasons' - All Seasons Sugarberry
Celtis occidentalis 'Prairie Pride' - Prairie Pride Hackberry

Cladrastis kentukea - Yellowwood
 Corylus colurna - Turkish Filbert
 Fagus grandifolia - American Beech
 Fagus sylvatica - European Beech
 Ginkgo biloba - Ginkgo (male only)
 Gleditsia triacanthos inermis - Honeylocust
 Liriodendron tulipifera - Tuliptree
 Metasequoia glyptostroboides – Dawn Redwood
 Quercus alba - White Oak
 Quercus bicolor - Swamp White Oak
 Quercus coccinea - Scarlet Oak
 Quercus macrocarpa - Bur Oak
 Quercus muehlenbergii - Chinkapin Oak
 Quercus rubra - Northern Red Oak
 Quercus velutina – Black Oak
 Taxodium distichum - Bald Cypress
 Tilia americana - American Linden
 Tilia cordata – Littleleaf Linden
 Tilia tomentosa - Silver Linden
 Ulmus parvifolia * - Chinese / Lacebark Elm
 Ulmus parvifolia * 'Dynasty' - Dynasty Chinese Elm
 Ulmus 'Pioneer' * - Pioneer Elm
 Ulmus x hollandica* 'Urban' – Urban Elm
 Zelkova serrata* – Japanese Zelkova
**Limit use – overplanted genus*

Evergreen Trees

Juniperus virginiana. – Red Cedar Juniper
 Picea abies - Norway Spruce
 Picea glauca – White Spruce
 Picea omorika - Serbian Spruce
 Picea pungens species - Colorado Blue Spruce
 Pinus strobes - Eastern White Pine
 Pinus nigra - Austian Pine
 Tsuga Canadensis – Eastern Hemlock

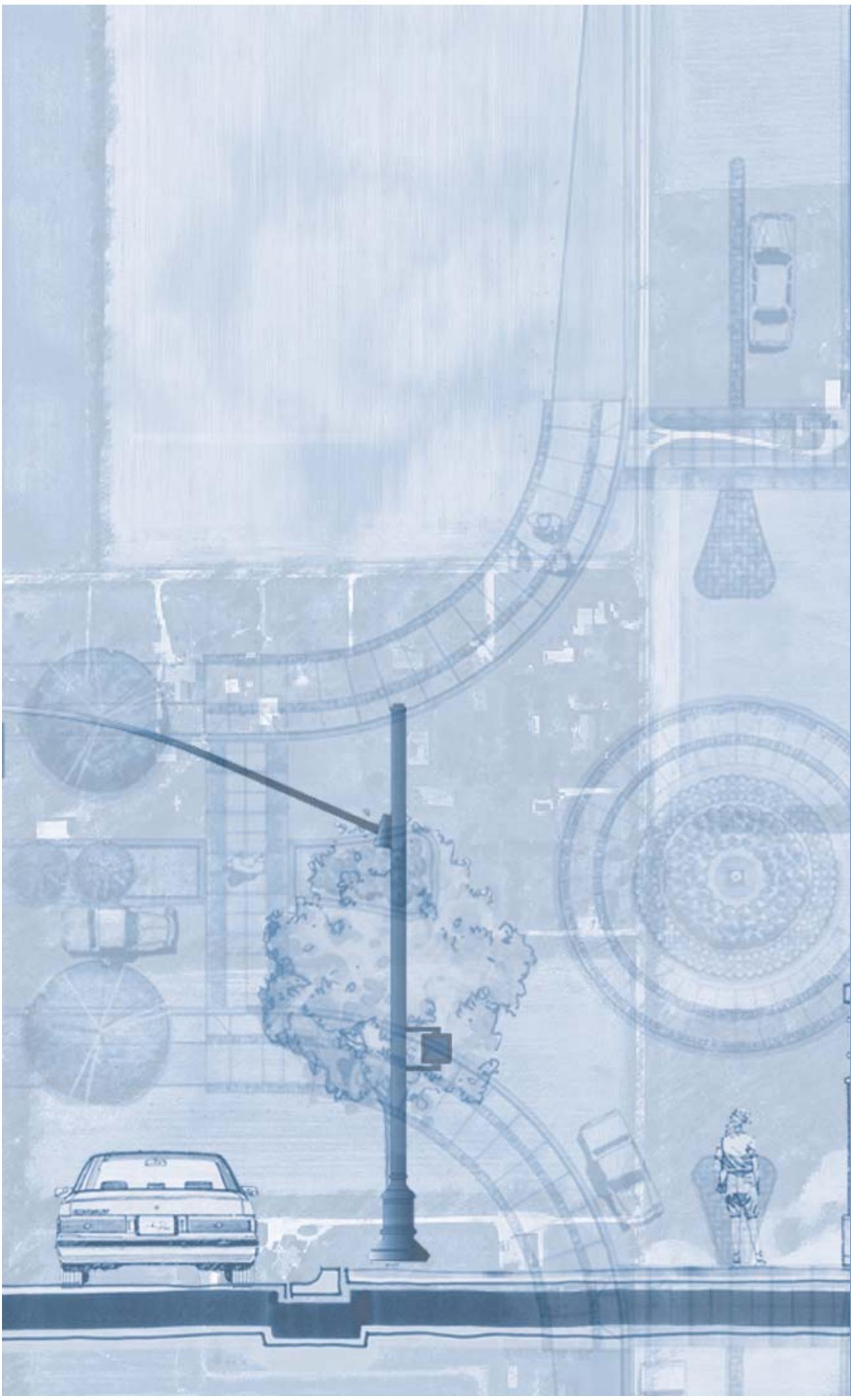
Undesirable Trees

Acer negundo - Boxelder: Aggressive, Shallow roots, Weak wood
 Acer Platanoides – Norway Maple: Invasive Plant
 Acer saccharinum - Silver Maple: Aggressive, Shallow roots, Weak wood
 Ailanthus altissima - Tree of Heaven: Seeds, Suckers, Weak wood, Invasive Plant
 Betula papyrifera – Paper Birch: Insects
 Betula pendula – European White Birch: Insects
 Elaeagnus angustifolia - Russian Olive: Form, Disease
 Fraxinus velutina glabra - Modesto Ash: Sidewalk damage problems
 Fraxinus americana - White Ash: Emerald Ash Borer
 Fraxinus pennsylvanica - Green Ash: Emerald Ash Borer
 Ginkgo biloba - Female - Female Ginkgo: Fruits
 Morus species - Mulberry: Fruits, Shallow roots, Invasive Plant

Pyrus calleryana 'Bradford' – Bradford Pear: Weak branching, Low branches
Populus alba - White Poplar: Suckers, Shallow roots, Weak wood
Populus deltoides - Cottonwood: Weak wood, Shallow roots, Seeds
Populus nigra 'Italica' - Lombardy Poplar: Insects, Disease, Short-lived
Quercus palustris – Pin Oak: Soil problems, Yellowing, Low branches
Quercus shumardii - Shumard Oak
Rhamnus cathartica, *Rhamnus frangula* – Buckthorns: Invasive Plant
Robinia pseudoacacia – Black Locust: Invasive Plant
Salix species - Willow: Weak wood, Shallow roots
Ulmus americana - American Elm: Insects, Disease
Ulmus pumila - Siberian Elm: Weak wood, Seeds, Invasive Plant

Undesirable Groundcovers

Euonymus fortunei – Purpleleaf Wintercreeper: Invasive Plant
Vinca minor – Periwinkle: Invasive Plant



HNTB