CENTRAL INDIANA TRAIL-ORIENTED DEVELOPMENT STUDY

MARCH 2024

MIG JLP+D

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CHAPTER 1:
INTRODUCTION

Minutemen Bikeway, Arlington, MA

WHAT IS TROD?

Trail-oriented Development (TrOD) is:

- A compact development pattern that is mixed use, residential, and/or commercial
- Clustered around off-street walking and bicycling infrastructure (trails)
- Walkable, human-scaled land use and design context oriented specifically toward trails and their users
- Intended to create vibrant places that promote active modes of transportation and recreation

BEST PRACTICES

For the purposes of understanding best practices for TrOD in Central Indiana, this section focuses on mixed-use developments and districts along or near off-street, shared-use trails in a range of geographies and land use contexts, from small towns and suburban downtowns to dense urban neighborhoods.

National demand for trail-oriented development is strong and increasing. A report by the Urban Land Institute in 2015 found that, in the United States, over half of all people surveyed and nearly two-thirds of millennials would like to live in places that do not require frequent use of a car. The same report found that half of US residents believe their communities need more bike facilities.

A NATIONAL TRANSPORTATION FUNDING PRIORITY

Funding for trail infrastructure is growing. The 2021 federal Infrastructure Investment and Jobs Act provides billions over five years for a range of investments that might serve "active transportation" (cycling and pedestrian) projects. This includes a set-aside of $7.2 billion for dedicated bicycle and pedestrian projects, an increase of 71% over the previous funding cycle. This set aside now comprises 10% of the total block grant program available for state surface transportation projects. Grants from the Rebuilding American Infrastructure with Sustainability and Equity program, the Transportation Alternatives Program, the Active Transportation Infrastructure Investment Program, the Neighborhood Access and Equity Grant Program , and others have directed additional billions of federal funds into active transportation projects nationwide and demonstrate the central role that walking and bicycling infrastructure have in promoting sustainable and equitable transportation and economic development.

Charlotte Rail Trail, Charlotte, NC

EXPANDING TRANSPORTATION NETWORKS AND OPTIONS

The abundance of funding for active transportation projects responds to the desire of Americans to live in places where driving is just one of many transportation options. While rail-to-trail conversion (that is, the conversion of an underused or unused rail line corridor to shared use paths and trails) has obvious health and recreation benefits, off-road walking and bicycling facilities are increasingly seen as an important component of a core transportation network. For example, completion of trails that connected housing to job centers in metropolitan Minneapolis were associated with an increase in the rate of bicycle commuting to work.

Trail systems improve livability by improving transportation options, especially for residents who sometimes or always travel without cars, and especially in places served by many trail and transit facilities that are well connected to each other. Suburban areas, small towns, and rural areas, which often have limited access to transit networks and lack safe and connected travel options for those not using vehicles, may see even greater benefits from expanded trail networks.

IMPROVING HEALTH AND WELL-BEING

Trails and trail-oriented development are associated with positive health and recreational benefits. Trails have been linked to increased physical activity and trails in rural communities, where risks of poor health outcomes from sedentary lifestyles are high, are shown to increase walking. Physical activity in natural settings is also associated with quantifiable improvements in mood and self-esteem. The systemic benefits of this can be significant: a 2011 study by the Delaware Valley Regional Planning Commission found that use of parks and trails in southeastern Pennsylvania led to health benefits that avoided nearly $200 million in direct medical costs and nearly $600 million in indirect costs.

BeltLine, Atlanta, GA

SUPPORTING VIBRANT LOCAL ECONOMIES

Trails can increase local economic prosperity and fiscal health. Businesses along the Indianapolis Cultural Trail saw increased revenue of 48% from 2008 to 2015, leading to job creation related to serving the increased customer base. A 2015 study found that the trail generates up to 214,000 annual visits and that trail visitors expected to spend approximately $53 per person per day, much of it in hospitality establishments. Similar examples exist on trail systems and networks throughout the Midwest and eastern US:

- The Circuit, a 750-mile trail network in greater Philadelphia and southern New Jersey, was estimated to have contributed nearly $500 million to the New Jersey economy in 2011.
- The Great Allegheny Passage, a 150-mile trail connecting nine towns between Pittsburgh, PA and Cumberland, MD, is estimated to generate $40 million in trail-related revenue from its nearly one million annual visitors. Trailside towns averaged a net gain of 65 new businesses between 2007 and 2015.
- The 227-mile Erie Canalway Trail in upstate New York sees more than 1.6 million annual visits, and the 2.5% of those who aren't from the 35 counties around the trail spend an average of $531.47 per trip, accounting for 21% of total annual spending related to the trail.

Trails and greenways are also correlated with increased property values: a national average increase of 10% is observed within a quarter-mile of trail facilities. In urban areas the change can be much more significant. Property values along the Indianapolis Cultural Trail increased 148%, or $1 billion, from 2008 to 2015. A study by the Trust for Public Land of the property value impacts of the Great Rivers Greenway found that people were willing to pay more for property located near parks, greenways, and trails, and that the property value increase associated with the Great Rivers Greenway had boosted property tax revenues by nearly $1 million annually. The report also noted that these facilities strengthen quality of life, attract employers and employees, and strengthen the region's local economies.

The overall economic impact of trails is significant, estimated in 2019 to contribute more than $34 billion annually to the United States economy. A 2012 study by the American Association of State Highway and Transportation Officials found that trail enhancements created 17 construction jobs per $1 million spent, more than any other type of infrastructure project. Trails are an increasingly integral part of an outdoor recreation economy that the Bureau of Economic Analysis estimated generated a $688 billion annual output in 2021.

Monon Trail, Carmel, IN

ADVANCING SOCIAL EQUITY AND COMMUNITY WELL-BEING

Trails can have a substantial positive impact on environmental and social outcomes for adjacent and nearby communities. Trail-oriented development strategies increase connectivity between communities, inviting more walking and bicycling and replacing pollution-generating automobile trips. The Centers for Disease Control and Prevention and the National Recreation and Park Association identified a lack of trail resources in American communities as a health equity concern, and the COVID-19 pandemic has further underscored the need for housing needs to be met in places with access to healthy and sustainable open spaces and transportation infrastructure. A 2022 survey revealed that many Central Indiana residents are dissatisfied with the walkability of their neighborhoods and their access to a broader range of transportation choices, and that a majority of those surveyed would prefer to live in mixed-use neighborhoods. Trail-oriented development that includes a mix of commercial amenities and residential housing options can provide access to new transportation options while delivering the walkable communities people want to live in or near.

The same survey indicated a desire across the region for greater access to housing that is affordable and a growing demand, especially in the region's central and northern counties, for townhouses and apartments. Many successful TrOD projects include a mix of apartments and townhouses of varying sizes and can help ease affordability by adding supply. Housing that is better connected to green spaces and transportation services can increase rapidly in value, increasing risks for displacement, and trail-oriented development plans should address affordable housing risks proactively to avoid this unintended consequence.

In addition to their direct transportation and health benefits, trails are part of a sustainable community development strategy. Landscaped greenways can help reduce the urban heat island effect, act as stormwater and flood mitigation infrastructure, serve as wildlife habitat, and improve local air, noise, and water quality. Trail and trail-oriented development planning should incorporate performance measures to achieve equity goals that are concrete and grounded in available data sources. Progress against these measures should be evaluated on an ongoing basis, and equity goals and investment strategies should be adjusted as needed to ensure projects remain on track to advancing project equity impacts.

Rail Trail, Charlotte, NC

CASE STUDIES

The project team scanned existing trail-oriented development in metropolitan areas across the United States to identify a short list of systems with greatest relevance to Central Indiana using the following criteria:

- Central city or metropolitan area of a similar size, climate, and economic context to Indianapolis
- A built-out comprehensive multi-use path network, or one with significant progress toward completion, much of which uses rail-to-trail or rail-with-trail configurations
- Multiple nodes of transit-oriented development immediately adjacent to the trail network

The resulting list includes the Charlotte Rail Trail (Charlotte, NC), the BeltLine (Atlanta), and the Midtown Greenway (Minneapolis). The following table provides a high-level comparison of the three primary case study locations to Central Indiana.

Each case study (within the complete Best Practices Memorandum in the appendix of this document) includes key takeaways, existing imagery, diagrams of the development's orientation to the trail, building heights, and node spacing information.

	Charlotte (CLT)	*Atlanta (ATL)*	*Minneapolis (MSP)*	*Indianapolis (IN)*
Population (city)	879,709	498,715	429,954	887,642
Population density (city)	2,937 / sq mi	3,685 / sq mi	7,962 / sq mi	2,455 / sq mi
Population growth (city, 2010-2020)	20.3%	18.7%	12.4%	8.2%
Population (metro)	2,660,329	6,089,815	3,690,261	2,111,040
Walk/bike/transit to work (metro)	3.7%	4.7%	7.9%	3.0%
Employment growth (metro, 2010-2020)	71.7%	25.3%	13.4%	29.0%

Summary of Case Study Cities

BEST PRACTICES SUMMARY

The best practices from each case study are summarized in the following table, arranged by theme. A check mark indicates the case study that best illustrates each practice, though most practices can be observed in multiple case studies. The memorandum also includes additional lessons from emerging trails systems in Tennessee.

Transit and Transportation	*CLT*	*ATL*	*MSP*	*TN*	*IN*
Coordinate transit-oriented and trail-oriented development to maximize the benefits of both.	✓				
Integrate trails and TrOD with the regional transportation network, partnering with the regional transit agency for coordinated buildout and seamless access between the two systems.		✓			
Plan greenways to leave space for potential rail transit in the future.			✓		
Prioritize maintenance of trails, year-round.			✓		
Identify trail segments and trail-oriented development opportunities that close critical gaps in the system wide network.			✓		
Regularly evaluate progress toward project goals and adjust planning and regulatory strategies as needed to ensure equity impacts and other public benefits are realized.	✓	✓	✓	✓	✓
Planning and Engagement	***CLT***	***ATL***	***MSP***	***TN***	***IN***
Frame greenways as a transportation strategy and trail-oriented development as an open space preservation strategy.			✓	✓	
Use trail-oriented development as an economic development strategy.					✓
Talk early and often about creative financing strategies and long-term economic value.			✓	✓	
Create a comprehensive plan that anticipates economic growth and increased development interest.	✓		✓	✓	
Partner with nonprofits that will advocate for the success of trails and trail-oriented development.			✓		
Establish a unified governance and management structure with a coordinated branding and marketing message.			✓	✓	

Housing and Social Impacts	*CLT*	*ATL*	*MSP*	*TN*	*IN*
Anticipate where rising property values around planned and constructed trails are most likely to result in gentrification and displacement. Consider acquiring land in those areas as future sites for affordable housing before property values rise.		✓			
Use a broad variety of tools to achieve the economic, environmental, cultural, and social benefits of the project - and use those tools in targeted ways that respond to the different needs and opportunities for each neighborhood and section of the trail network.		✓			
Establish achievable affordable housing goals grounded in market and funding realities.		✓			
Urban Design and Development Regulations	*CLT*	*ATL*	*MSP*	*TN*	*IN*
Lead with targeted local government investments in civic spaces that "set the table" for private development to come.					✓
Ensure trails connect intuitively to walkable, human-scaled neighborhood streets and land uses.					✓
Carefully craft development regulations to influence how trail-adjacent land is used, especially when the City does not own or directly control key parcels.	✓				
Require that trail-adjacent buildings have a "front-door" orientation toward the trail, specify trail-friendly densities and uses, and mandate completion or upgrades of trail segments as parcels are developed.	✓				
Use parking maximums and density minimums to incentivize mode shift to trails (and transit if applicable).	✓				

CHAPTER 2:
DESIGN GUIDELINES

Green Lake Park, Seattle, WA

The design guidelines are intended to shape successful Trail-Oriented Development (TrOD) in different contexts. The design guidelines are organized into four sections:

- **GENERAL**
- **DEVELOPMENT**
- **MOBILITY & SAFETY**
- **COMFORT**

GENERAL TrOD GUIDELINES

Trail-oriented Development nodes are key activity places that connect a trail and trail users with destinations and amenities. While traditional development may center around vehicles, TrOD focuses on the trail as a primary path of transportation and recreation, and prioritizes multimodal facilities and connections over vehicles.

Uses are generally a mix of commercial, employment, entertainment, residential, and civic, creating unique destinations and encouraging gathering. Housing in TrOD is primarily multi-family and attached single family of various scales, accompanied by supportive commercial uses and places for gathering. Trail access is well-marked and accessible. Buildings and people interact with the trail through trail-facing entrances, ground floor activation including active building frontages, transparency (windows), outdoor dining, and minimal setbacks.

Rail Trail, Charlotte, NC

Density is generally focused along the trail and decreases with distance. Building bulk is reduced through architectural elements such as stepbacks, materials, and colors. Setbacks are minimal, usually between 10 and 20 feet, and include active uses such as dining, outdoor gathering spaces, play areas, landscaping, or exhibitions.

The trail corridor should include ample landscaping that provides shade and refuge, as well as serving as buffers along roadways and breaking up large facades. Amenities such as public restrooms, shade, waste receptacles, and seating should be provided. Art should identify the character of the neighborhood and should fit the context of the node. Spaces should be provided along the trail for play, events, and gathering.

Lighting along trails and near trail entrances provides security and enables trail use at all times of day. Buffers and safe street crossings minimize potential conflict with vehicles.

These Design Guidelines are standard for all types of TrOD, with relevant considerations for certain TrOD types. The typology in this document identifies ten unique types of TrOD that may be appropriate along regional trails throughout Central Indiana. These types help us understand how TrOD can vary by location while best leveraging the trail assets and creating positive experiences for all users. The typology provides unique considerations for the design guidelines in different contexts.

TrOD TYPOLOGY

Considerations within the design guidelines are provided unique to the TrOD Typology, details of which can be found starting on page 30. The ten TrOD types include:

1. **Vertical Mixed-Use:** Vibrant cluster of uses with people there for different reasons.
2. **Main Street Connector**: Bridges gap between trail and main streets/ downtowns.
3. **Local Community Gathering:** Mostly restaurants, public spaces, and facilities at small scale.
4. **Civic/Employment Hub:** Commuter destination with a mix of job types.
5. **Commercial/Entertainment Center:** Focus on goods and services with high visibility.
6. **Innovation/Maker Place:** Indoor/outdoor engaging and creative use of space.
7. **Mobility Hub:** Mobility hub at the junction of transit and trail-oriented development.
8. **Recreation Destination**: Primarily parks and open space with an emphasis on environmental sensitivity.
9. **High Density Neighborhood:** Multifamily, some attached single family with supportive commercial.
10. **Low Density Neighborhood:** Attached and detached single family and ADUs between nodes.

DESIGN GUIDELINES: DEVELOPMENT

Monon Trail, Carmel, IN

The physical design of the space and buildings around a TrOD node defines its character, public realm, and ensures the connection between the trail and adjacent uses is strong.

The Development Design Guidelines include the following topics:

- Land use mix
- Trail access, site orientation, and parking
- Ground floors
- Visibility
- Building setbacks
- Building stepbacks
- Landscape and public art

LAND USE MIX

A mix of uses best supports trail-oriented development, ensuring the node is most active with people there at most times of day and throughout the week for many different reasons. Appropriate uses may include higher density residential, commercial/retail, office, entertainment, civic, institutional, and public open space. Opportunities for affordable housing and the preservation of existing homes and businesses should be considered.

TrOD Type Considerations

- **Vertical Mixed Use:** Primarily vertically mixed use buildings, with ground floor commercial, and residential and office uses on upper floors.
- **Main Street Connector**: Complements existing uses in adjacent main street/ downtown area.
- **Local Community Gathering:** Primarily small local businesses that serve the surrounding community and the occasional regional visitors.
- **Civic/Employment Hub:** Primarily civic and employment uses, with supportive commercial such as retail, restaurants, and daycares.
- **Commercial/Entertainment Center:** Destination commercial and entertainment uses, can be large in format.
- **Innovation/Maker Place:** Light industrial mixed use and flex spaces.
- **Mobility Hub:** Primarily public space that serves transit and mobility needs, with supportive commercial and residential uses.
- **Recreation Destination:** Primarily parks, public spaces, and nature preserves.
- **High Density Neighborhood**: Primarily multi-family residential of various scales, with supportive commercial.
- **Low Density Neighborhood**: Primarily low-density residential uses.

Cultural Trail, Indianapolis, IN

Rail Trail, Charlotte, NC

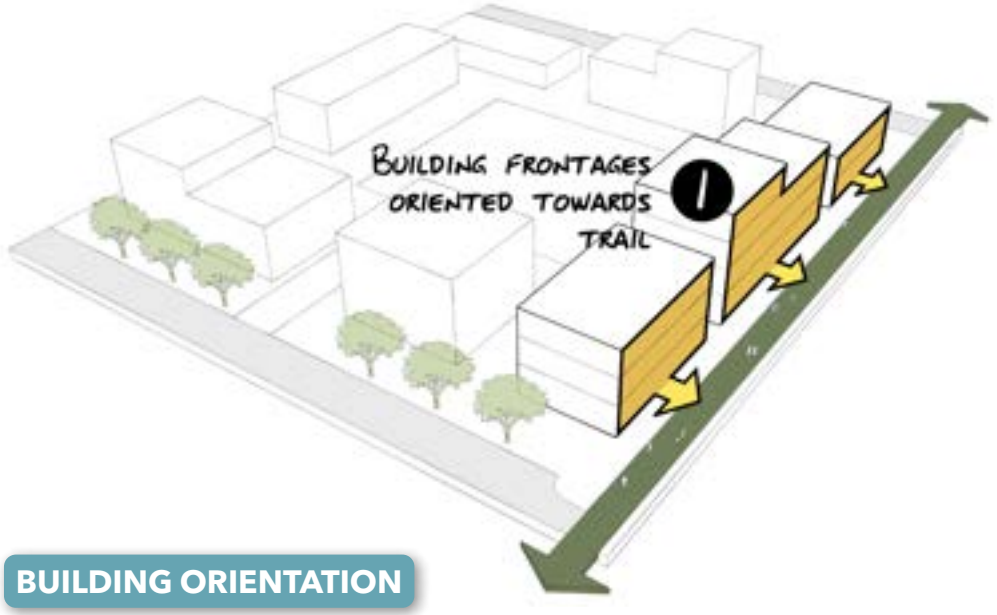
Monon Trail, Indianapolis, IN

TRAIL ACCESS, SITE ORIENTATION, AND PARKING

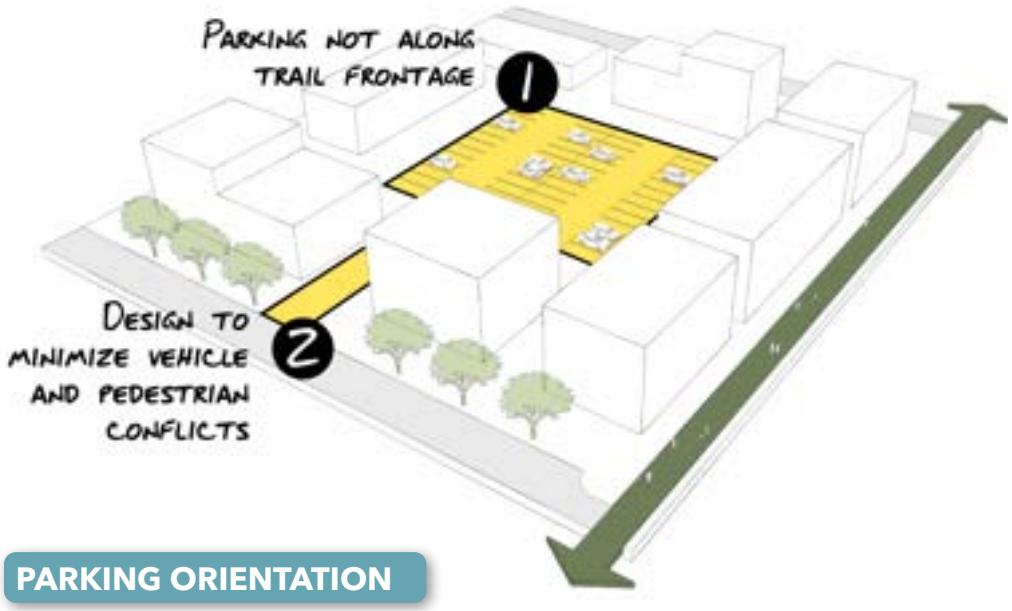
Building frontages should be oriented towards the multi-modal trail corridor and mobility hubs. Trail access should be provided to and through a site. Parking is located to minimize conflicts between vehicular and pedestrian movement. Parking should be located behind or on the side of structures and not along trail access, allowing development to activate the trail and street frontages. Structured parking may often be appropriate in TrOD nodes, but surface parking should also be allowed to contribute to affordability.

TrOD Type Considerations

- **Main Street Connector**: Enhanced signage, amenities, and landscaping connect the trail and main street/downtown areas.
- **Commercial/Entertainment Center**: When entrances aren't oriented towards the trail, ideally they are well connected with signage and trail spurs.
- **Innovation/Maker Place:** Trail-adjacent parking should be used as flex space for food trucks and pop-up events.
- **Mobility Hub**: Strong access to trail, with commuter parking nearby.
- **Recreation Destination**: Expanded parking may be located at or near these nodes, often serving as trailheads.
- **Low Density Neighborhood**: Building frontage does not need to orient to trail. Trail access is provided but not disruptive. Public parking is generally limited to existing on-street parking.



BUILDING ORIENTATION



PARKING ORIENTATION

GROUND FLOORS

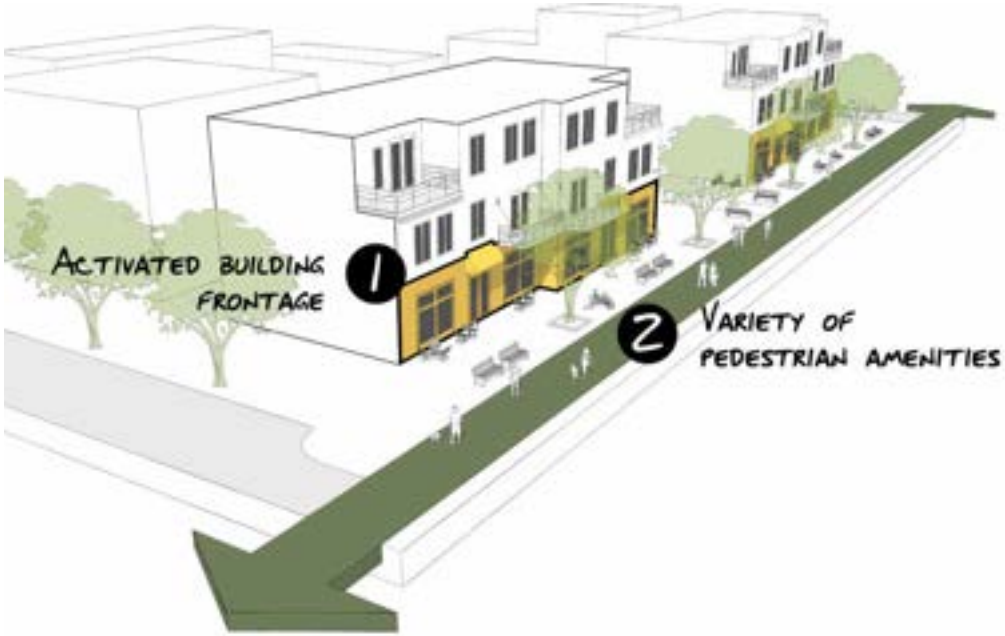
Entrances should be highly visible and oriented to trail but may also have both a public-facing front and back door. Pedestrian-scale building texture, articulation, and ample transparency activates trail.

TrOD Type Considerations

- **Innovation/Maker Place:** Flex and light industrial buildings with large rooms and high ceilings allow for creative use of space. Roll up garage doors allow improved access during warmer months.
- **High Density Neighborhood**: Entrances along the trail to ground floor residences should have public-facing elements such as stairs, stoops, and balconies. In mixed-use buildings, supporting commercial uses should be located on the ground floor and should be visually and physically activated and oriented towards the trail.
- **Low Density Neighborhood**: Physical space and other privacy methods should buffer private residential units from the trail.

Railyard Flats, Sioux Falls, SD

Pencoyd Trail, Bala Cynwyd, PA



VISIBILITY

The trail should be celebrated visually with clear orientation of buildings towards it. Commercial buildings will significantly benefit from visibility from an adjacent arterial or collector street in addition to visibility from the trail.

TrOD Type Considerations

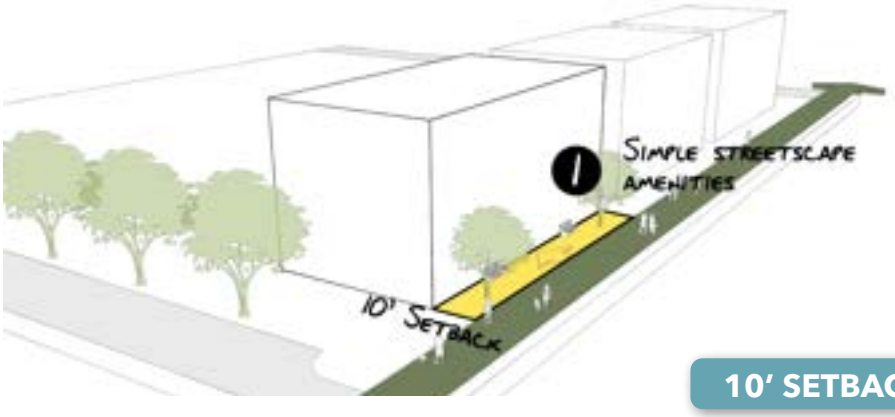
- **Main Street Connector:** Development pattern should support visual connections to adjacent downtown if possible.
- **Commercial/Entertainment Center**: Should be highly visible from both the trail and nearby roadways to support commercial viability.
- **Mobility Hub**: Direct visual connections between trail and transit nodes.
- **Low Density Neighborhood**: Privacy fences and vegetative screens may be present, but gates should be encouraged along trail.

Monon Trail, Carmel, IN

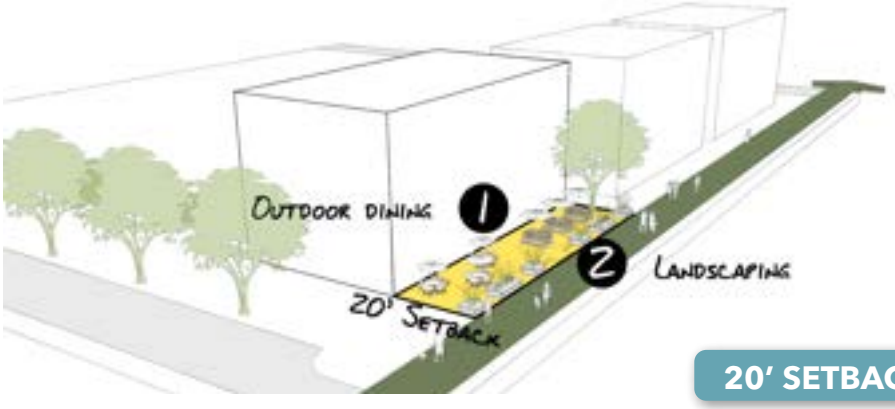
ArtLine, Lakewood, CO

BUILDING SETBACKS

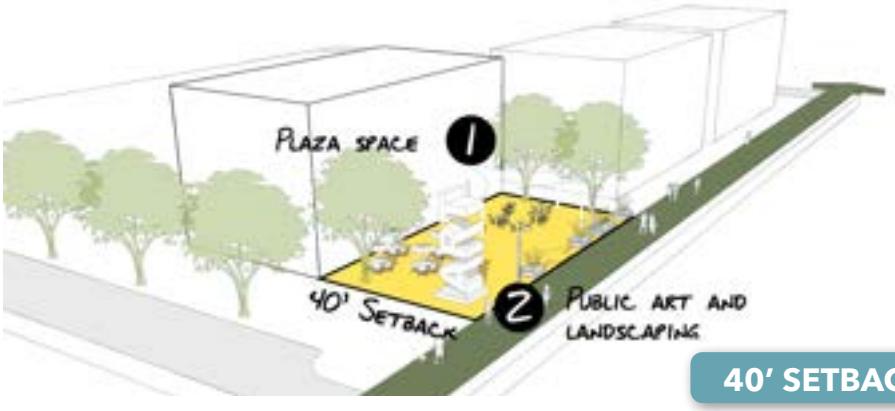
Setbacks should be provided to ensure space for pedestrians and amenities. Active outdoor uses such as dining, outdoor merchandise displays, or shaded rest spaces are encouraged within the setbacks. Care should be taken to prevent conflict in areas of small setbacks through proper orientation of building entrances, signage, fencing, and gates. A minimum setback of approximately 10' provides buffer from conflicts between trail and adjacent uses, and a maximum setback of approximately 20' ensures participation in node activity. Setbacks over 20' should be allowed in with proper programming and activation in the setback. Parking should not be located in the building setback along the trail unless parallel along a street.



10' SETBACK



20' SETBACK



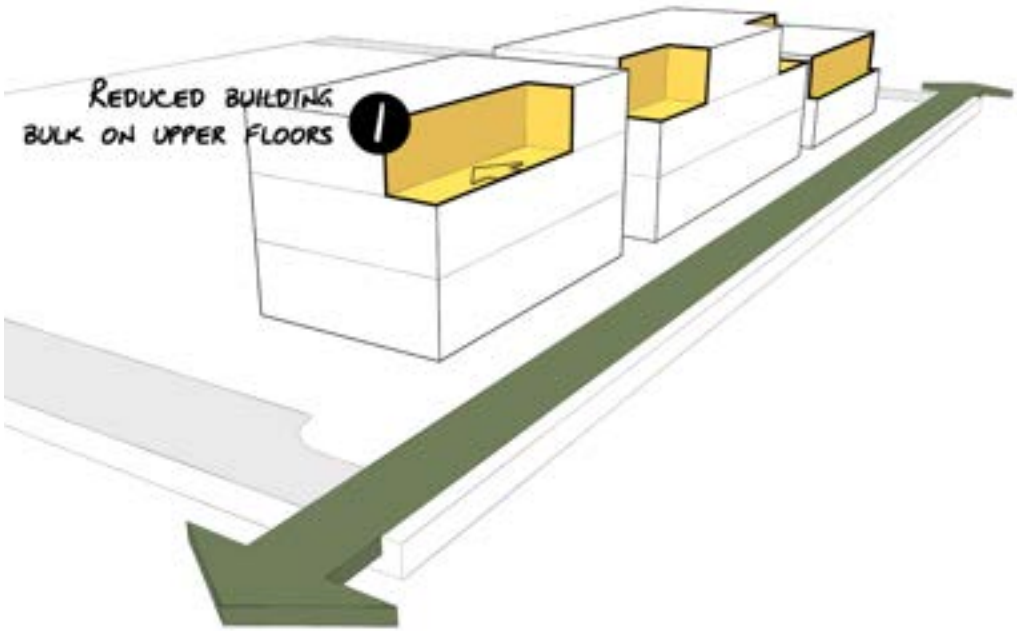
40' SETBACK

TrOD Type Considerations

- **High Density Neighborhood**: Setbacks may be greater to buffer residences from noise and visual impacts.
- **Low Density Neighborhood**: Setbacks may be greater to buffer residences from noise and visual impacts. Side and rear setbacks on residential properties may be fenced for privacy per local setback regulations. Private and/or common gates accessing the trail should be encouraged.

BUILDING STEPBACKS

Building height and development intensity should be generally greatest at the center of a TrOD node. Massing should reflect the intensity of the uses, and should transition gradually between buildings. Building bulk should be reduced through the use of upper story stepbacks for second stories and higher. These stepbacks can be used for upper story patios and green roofs.



TrOD Type Considerations

- **Vertical Mixed Use**: Include public and private patios to engage with the trail.

LANDSCAPE AND PUBLIC ART

Landscaping should provide shade and rest opportunities, be aesthetically pleasing, contribute to the trail/node's identity, break up large facades, and separate pedestrian and vehicular spaces. Existing natural features such as waterways, native species, and cultural/interpretive signage should be integrated into trail system design. Invasive species should be replaced with native, especially to establish a healthy tree canopy to provide shade. Art should reflect the character of the surrounding area and fit within the context of the neighborhood. Landscaping should include stormwater management features and green infrastructure integrated into the trail design and function.

TrOD Type Considerations

- **Innovation/Maker Place:** Art showcases the work of local makers.
- **Recreation Destination**: Landscaping reflects the character of the destination, either manicured or natural.
- **High Density Neighborhood**: Neighborhoods should have landscaped, common-use open spaces that include art or relaxation opportunities.
- **Low Density Neighborhood**: Small-scale monuments, signage, or art should indicate public trail access.

ArtLine, Lakewood, CO

Monon Trail, Carmel, IN

DESIGN GUIDELINES: MOBILITY & SAFETY

Rail Trail, Charlotte, NC

TrOD nodes are ideal locations for mobility hubs and can incorporate transit stops, bike/scooter share, and clear access to the trail in one central location.

The Mobility and Safety Design Guidelines include the following topics:

- Crossing treatments
- Accessibility
- Trail width and delineation
- Lighting and security
- Bike/scooter parking, share, and repair
- Identity and wayfinding signage

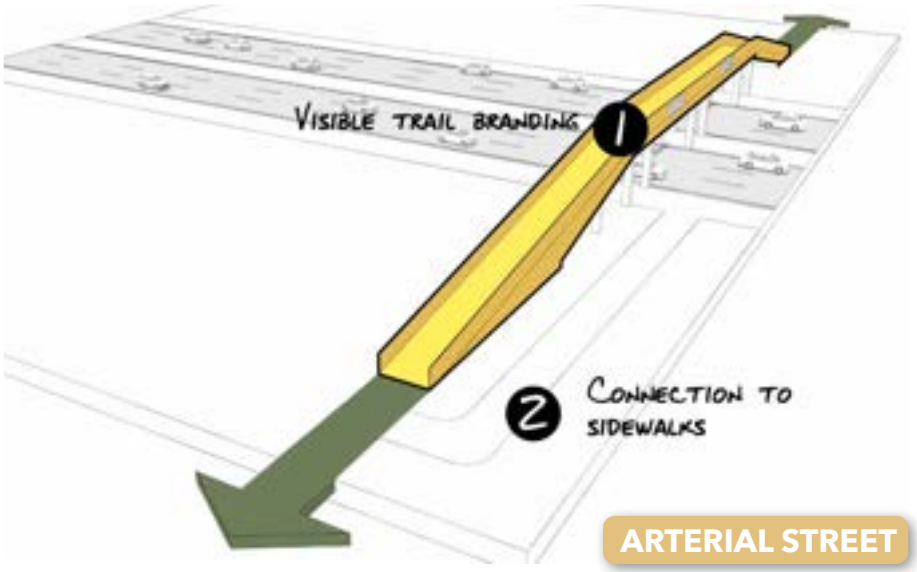
CROSSING TREATMENTS

Street crossings should be well-marked and highly visible to both users and drivers. Crosswalks should be raised to the height of the trail, creating a speed bump for vehicles. Other pedestrian safety enhancements should be used such as enhanced crossing signals (e.g. RRFB or HAWK), curb bumpouts to reduce crossing widths, and pedestrian refuges whenever possible. Crossings should be well-lit for both trail users and approaching vehicles.

When crossing arterial roads, pedestrian bridges or underpasses should be utilized to create a seamless, safe experience for trail users while minimizing conflict and traffic impacts. Drivers should also be alerted to upcoming trail intersections through signage, warning strips, speed bumps, reduced speed limits, or other methods.

TrOD Type Considerations

- Consistent for all



ACCESSIBILITY

Accessibility should be considered for all abilities within TrOD nodes and along all sections of trails. This includes ADA-accessible elements, as well as universal symbols for non-English speakers, transit options for those who do not own vehicles, and free access to basic amenities in public spaces (see Comfort Design Guidelines later in this document).

Elements of physical ADA design include paved trails, warning strips, and curb ramps. Additionally, automated external defibrillators (AED's) can be placed along trails in the event of a medical emergency.

Eagle Creek Trail, Indianapolis, IN

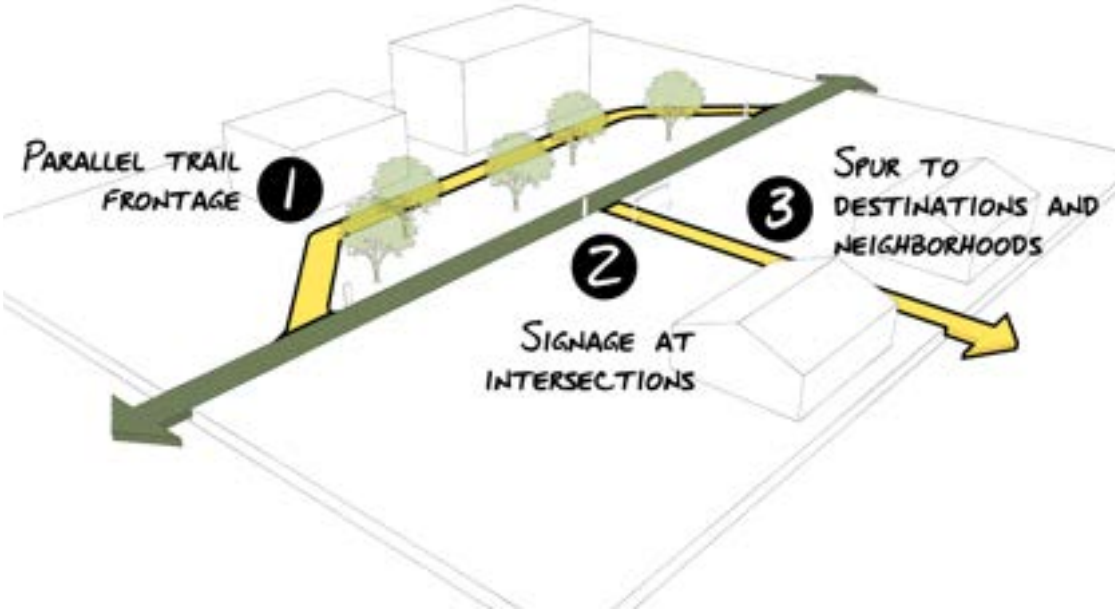
National Park Service

TrOD Type Considerations

- Consistent for all

TRAIL WIDTH AND DELINEATION

The trail should be wider along building frontages and surrounding transit hubs to accommodate more users. Intersections with other trails as well as spurs leading to adjacent development and network connections should be well marked. The trail should be detached from roads using right-of-way, trees and vegetation, or other visible, physical buffers. Regional trails should be delineated from roadways, sidewalks, and side paths through unique materials, colors, and/or paving patterns. High trail traffic areas should have a painted or paver center line to encourage users to stay to the right. When trail width allows, separating bikes and pedestrians into two lanes can help minimize potential conflicts.



Monon Trail, Carmel, IN

TrOD Type Considerations

- Consistent for all

LIGHTING AND SECURITY

Enforcement of rules and monitoring/patrolling are methods that can contribute greatly to safety and personal security. Adequate lighting should be provided within the public realm, with an emphasis along the trail, trailheads, underpasses, and at all TrOD. Lighting contributes to physical and personal safety and enables people to utilize the trail at more times of day, especially in winter when the sun sets earlier. Lighting should be considerate of adjacent development, dark-sky compliant, and may be motion activated in some contexts. Lighting should be allowed to spill onto trail from adjacent developments to contribute to safety. Emergency call buttons placed at nodes and along the trail add additional security. A signage program can allow buildings to identify that they are "trail-user friendly", welcoming trail users if security concerns arise.

TrOD Type Considerations

- **Mobility Hub:** Well-lit for commuters at all times of day and emergency call buttons present.
- **Recreation Destination:** Minimal lighting in natural areas outside of trail access points but expanded lighting in public parks. Motion-activated and dark sky lighting should be used.
- **Low and High Density Neighborhood:** Lighting should be pedestrian-oriented along sidewalks and trails, and should be considerate of residences.

BIKE/SCOOTER PARKING, SHARE, AND REPAIR

Access to shared mobility amenities should be provided at trail access points, especially when near trailheads. Amenities can include scooter and bike share stations, repair stations, secure bike parking, and bike/scooter-oriented wayfinding. Bike parking should be set at least five feet back from the trail to avoid parked bikes encroaching on the trail clear zone. Geofencing should be used for dockless bike and scooter share, ensuring that they are returned and used within the proper areas.

Fayetteville, AR

TrOD Type Considerations

- **Civic/Employment Hub:** Multimodal amenities that support commuters should be available, as well as bike and scooter parking near workspaces.
- **Mobility Hub**: Bike and scooter sharing options, secure long-term bike parking, and repair stations are available.

Burke-Gilman Trail, Seattle, WA

IDENTITY AND WAYFINDING SIGNAGE

Signage should be cohesive with the branding and identity of both the area and the trail. Nearby destinations and an overview trail map with travel distances and times should be visible and easily accessible. Secondary branding specific to individual nodes may be included. Interpretive educational signage should highlight landmarks, history, natural features, art pieces, and other local or cultural stories. Highly visible signage can be placed alongside the trail, but detailed signage requiring users to stop and read should include a small, paved area off the side of the trail. Commercial uses and destinations are highlighted via signage to increase visibility. Trail etiquette signage can also communicate codes of conduct and regulations. Mile marker signage provides wayfinding for recreational users as well as location identifiers in case of an emergency.

TrOD Type Considerations

- **Recreation Destination:** Signage should also serve trailhead and park entrance purposes, including providing park maps and information.

DESIGN GUIDELINES: COMFORT

Monon Trail, Carmel, IN

Elements of comfort must be included to ensure the success of any TrOD node and improve user confidence in travel without a vehicle. These comfort amenities should be appropriately spaced along trails and at TrOD nodes to ensure adequate refuge for trail users. Amenities can be provided by public entities, private developers, or through partnerships.

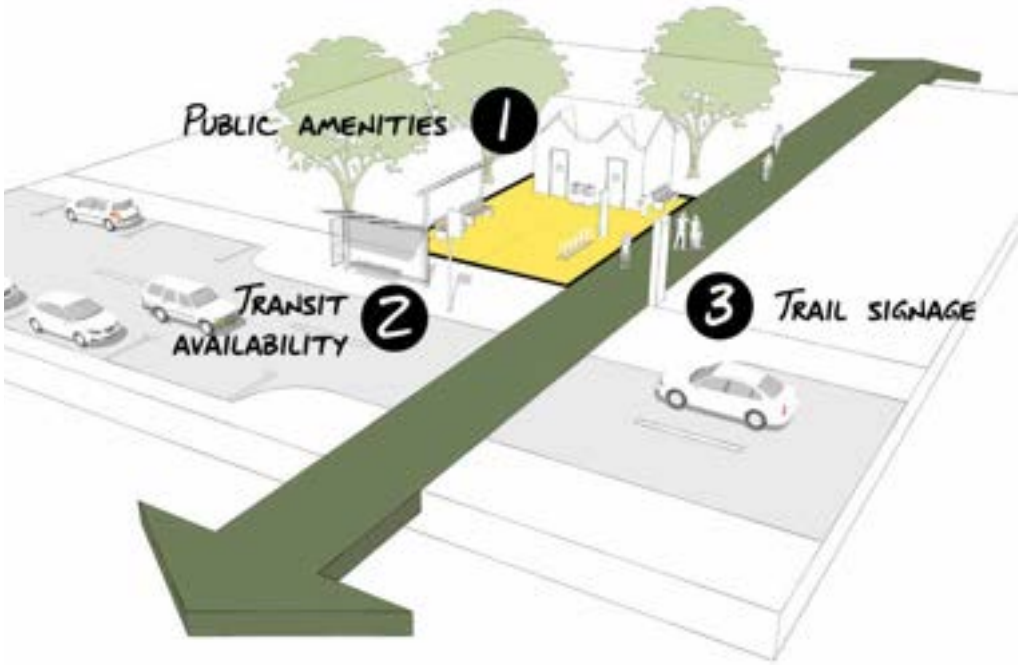
The Comfort Design Guidelines include the following topics:

- Restrooms and public amenities
- Seating and passive space
- Refuge and shade

RESTROOMS AND PUBLIC AMENITIES

Amenities that contribute to comfort and allow trail users to enjoy the trail for longer should include drinking water fountains/bottle fill stations, restrooms, trash and recycling receptacles, and charging stations. Public facilities should be incorporated into the mobility hub, at trailheads, and along the trail in small clusters.

Public restrooms should be located at TrOD nodes, utilizing partnerships with businesses where necessary. Public restrooms should also be provided at trailheads and every few miles along trails, as possible. Public wifi at nodes and in some places along trail may improve the experience where cellular service is limited or where gathering is encouraged. A signage program can allow buildings to identify that they are "trail-user friendly" with publicly-accessible amenities. All amenities should utilize Universal Design principles to ensure they are accessible for all trail users.



TrOD Type Considerations

- **Mobility Hub**: Convenient amenities such as restrooms, water fountains, waste receptacles, charging, and seating.
- **Civic/Employment Hub:** Restroom amenities may not be necessary since trail users' destinations in these areas likely have accessible restrooms.
- **High Density Neighborhood:** May not include some amenities like restrooms.
- **Low Density Neighborhood:** May not include some amenities like restrooms, water, charging, and waste collection.

SEATING AND PASSIVE SPACE

Seating and shade should be provided along the trail, within public spaces, and at transit stops to provide rest, respite, and social gathering opportunities. Seating should include both public passive spaces/plazas as well as programmed or private patio areas.

TrOD Type Considerations

- **Low Density Neighborhood:** May have benches along the trail but not gathering spaces.

REFUGE AND SHADE

Shade elements within public spaces and active zones can provide comfort in hot summer months using tree cover or structural elements such as canopies, shade sails, awnings, trellises, and umbrellas. Natural shade from tree cover should be provided between zones along the trail. Chairs, tables, trellises, and other shade features should be installed to create outdoor social areas in common spaces that serve as internal gathering spots.

River Garden, Memphis, TN

TrOD Type Considerations

- **Mobility Hub:** Warming huts and heat lamps may encourage commutes during winter weather.
- **Recreation Destination**: Shade is primarily from natural sources such as tree cover, but outdoor recreation amenities such as park pavilions or shelters should also be provided for year round coverage.

Legacy Trail, Sarasota, FL

TrOD TYPOLOGY

This typology outlines ten unique ways that successful TrOD may look in rural, suburban, and urban contexts.

The TrOD typology in this report includes ten TrOD types that may be appropriate for Central Indiana. These are intended to provide inspiration and guidance for development and the public realm but not limit the options for the forms and uses that can support the regional trail network. Each TrOD type includes a name, short description, overview of key characteristics, and unique qualities, and considerations for how the type may vary by context. The design guidelines from the previous section generally apply to all TrOD types, with certain unique qualities noted throughout this typology. Additionally, a graphic depiction of each TrOD type is intended to further visualize development patterns, land uses, public space, orientation and setbacks, and other highlights. The table below provides consolidated guidance regarding appropriate building heights for each TrOD type.

TrOD TYPE	APPROPRIATE BUILDING HEIGHT (stories)		
	RURAL	SUBURBAN	URBAN
VERTICAL MIXED-USE	N/A	3-5	4+
MAIN STREET CONNECTOR	1-2	2-3	3+
LOCAL COMMUNITY GATHERING	1-2	1-3	1-3
CIVIC/EMPLOYMENT HUB	N/A	3+	4+
COMMERCIAL/ENTERTAINMENT CENTER	1-3	1-4	2+
INNOVATION/MAKER PLACE	1-2	1-5	1+
MOBILITY HUB	1-2	2-5	4+
RECREATION DESTINATION	1-2	1-2	1-3
HIGH DENSITY NEIGHBORHOOD	N/A	3-5	4+
LOW DENSITY NEIGHBORHOOD	1-2	1-3	1-3

**Downtown Indianapolis and development along extensions of the Cultural Trail can and should be much more intense to reflect existing contexts and land values.*

VERTICAL MIXED USE

Vibrant cluster of uses with people there for different reasons.

A Vertical Mixed Use node includes a vibrant cluster of uses that attracts workers, shoppers, diners, and residents. These lively centers may consist of ground floor retail and restaurants with offices and high density housing on its upper floors. Ground floors have high transparency and actively engages trail users. Parking should be located on the sides or rear of buildings, not adjacent to the trail. When parking does exist adjacent to the trail, it should be screened with engaging art or landscaping. Where structured parking is located adjacent to the trail, design for flexibility over time for conversion to active ground floor uses.

The trail is well marked and transitions into highly walkable public spaces that include opportunities for shade, play, and relaxation. Public spaces such as plazas are shared by multiple businesses and include art, parklets, and seating/dining areas. The density of residents, workers, and visitors makes this node ideal for multimodal trail users.

Unique Qualities

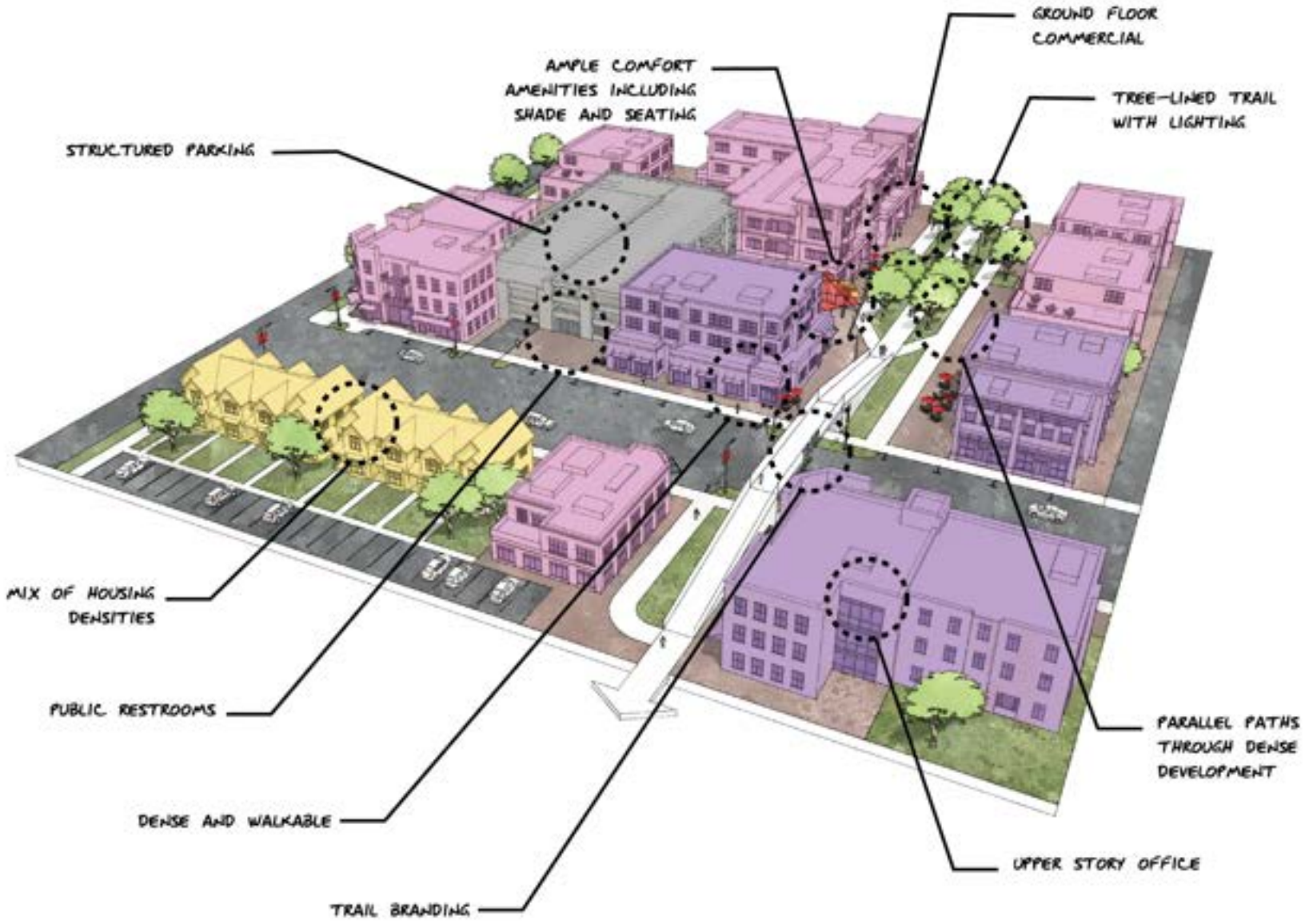
- **Land Use Mix:** Primarily vertically mixed use buildings, with ground floor commercial, and residential and office uses on upper floors.
- **Building Stepbacks**: Include public and private patios to engage with street.

Contexts

Urban: Highly dense and walkable, with many different mobility options and many land uses.

Suburban: May serve as a downtown or town center.

Rural: n/a


GROUND FLOOR COMMERCIAL
AMPLE COMFORT AMENITIES INCLUDING SHADE AND SEATING
TREE-LINED TRAIL WITH LIGHTING
STRUCTURED PARKING
MIX OF HOUSING DENSITIES
PUBLIC RESTROOMS
DENSE AND WALKABLE
TRAIL BRANDING
PARALLEL PATHS THROUGH DENSE DEVELOPMENT
UPPER STORY OFFICE
Legend
LOWER DENSITY RESIDENTIAL
MIXED-USE WITH RESIDENTIAL
MIXED-USE WITH OFFICE

MAIN STREET CONNECTOR

Bridges gap between trail and main streets/downtowns.

A Main Street Connector node bridges the gap between the trail and main streets or downtowns. The trail provides a transportation route for visitors to the area and clear signage and connections. Uses complement the nearby downtown through primarily residential and professional uses with potentially some small scale retail and restaurants.

Additional parking may be located in these areas to serve the nearby downtown but off-street parking should be located along sides or rear of buildings out of trail setbacks and visibly screened.

Users should be directed to transit options and destinations through highly-visible maps, signage, and assistive technology. Art and branding feature the unique character of the nearby downtown.

Unique Qualities

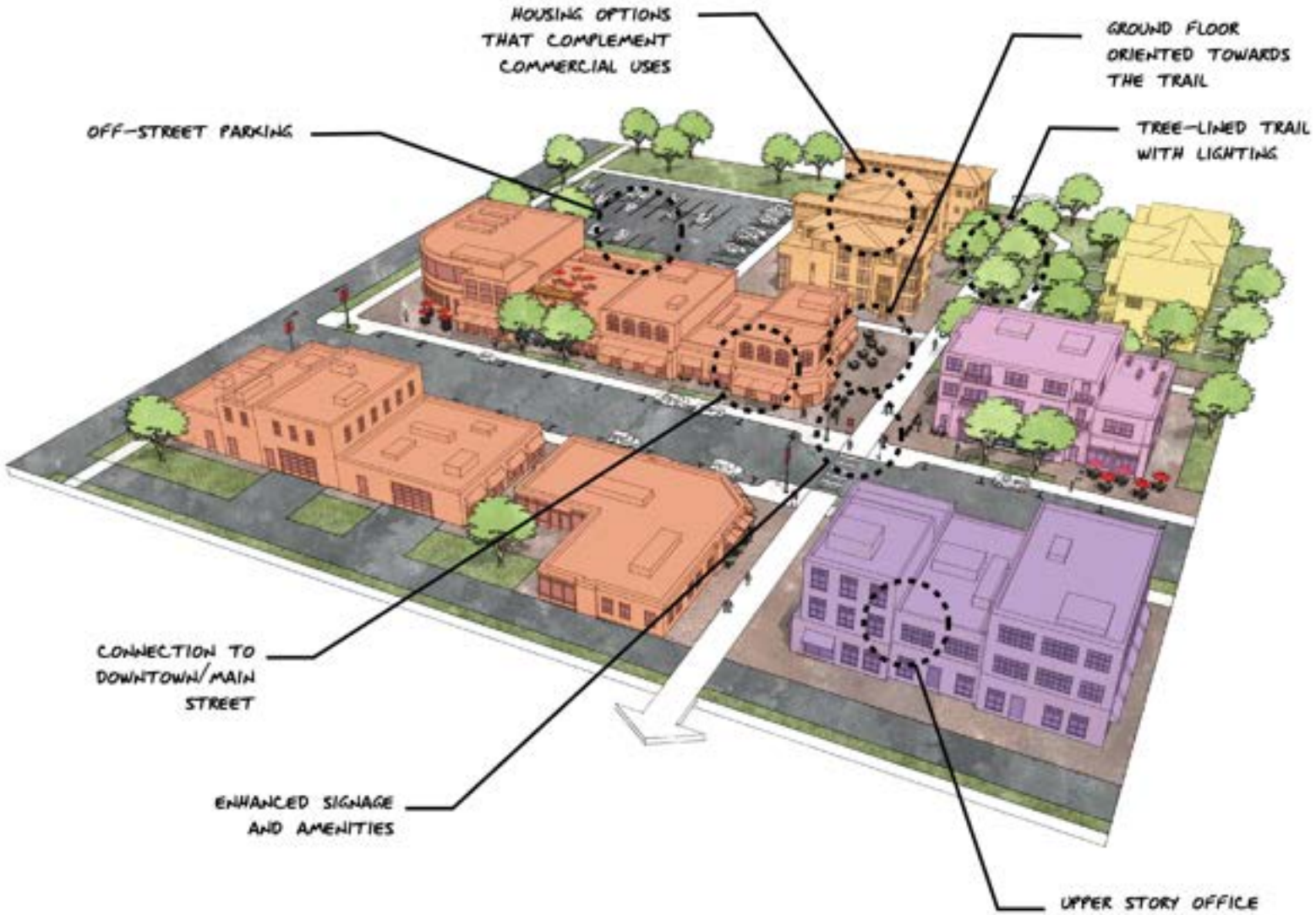
- **Land Use Mix**: Complements existing uses in adjacent main street/ downtown area.
- **Trail Access, Site Orientation, and Parking**: Enhanced signage, amenities, and landscaping connect the trail and main street/ downtown areas.
- **Visibility:** Development pattern should support visual connections to adjacent downtown if possible.

Contexts

Urban: Major connection between high-density, mixed-use areas.

Suburban: Node area likely contains more parking and housing than nearby main street or downtown.

Rural: Same as Suburban.



Legend

- LOWER DENSITY RESIDENTIAL
- MIXED-USE WITH RESIDENTIAL
- COMMERCIAL AND RETAIL
- HIGHER DENSITY RESIDENTIAL
- MIXED-USE WITH OFFICE

LOCAL COMMUNITY GATHERING

Mostly restaurants, public spaces and facilities at small scale.

Local Community Gathering nodes are small-scale, neighborhood-serving areas that consist primarily of restaurants, public spaces, and other facilities. This TrOD type provides a destination for people to support local businesses, see neighbors and friends, and attend community events. Trail visibility is high, directing to destinations around the node with maps and signage. Stepbacks on upper floors provide space for upper-story patios that reduce building massing and contribute to small scale. Parking should be located on the sides or rear of buildings, not adjacent to the trail. When parking does exist adjacent to the trail, it should be screened with engaging art or landscaping.

Unique Qualities

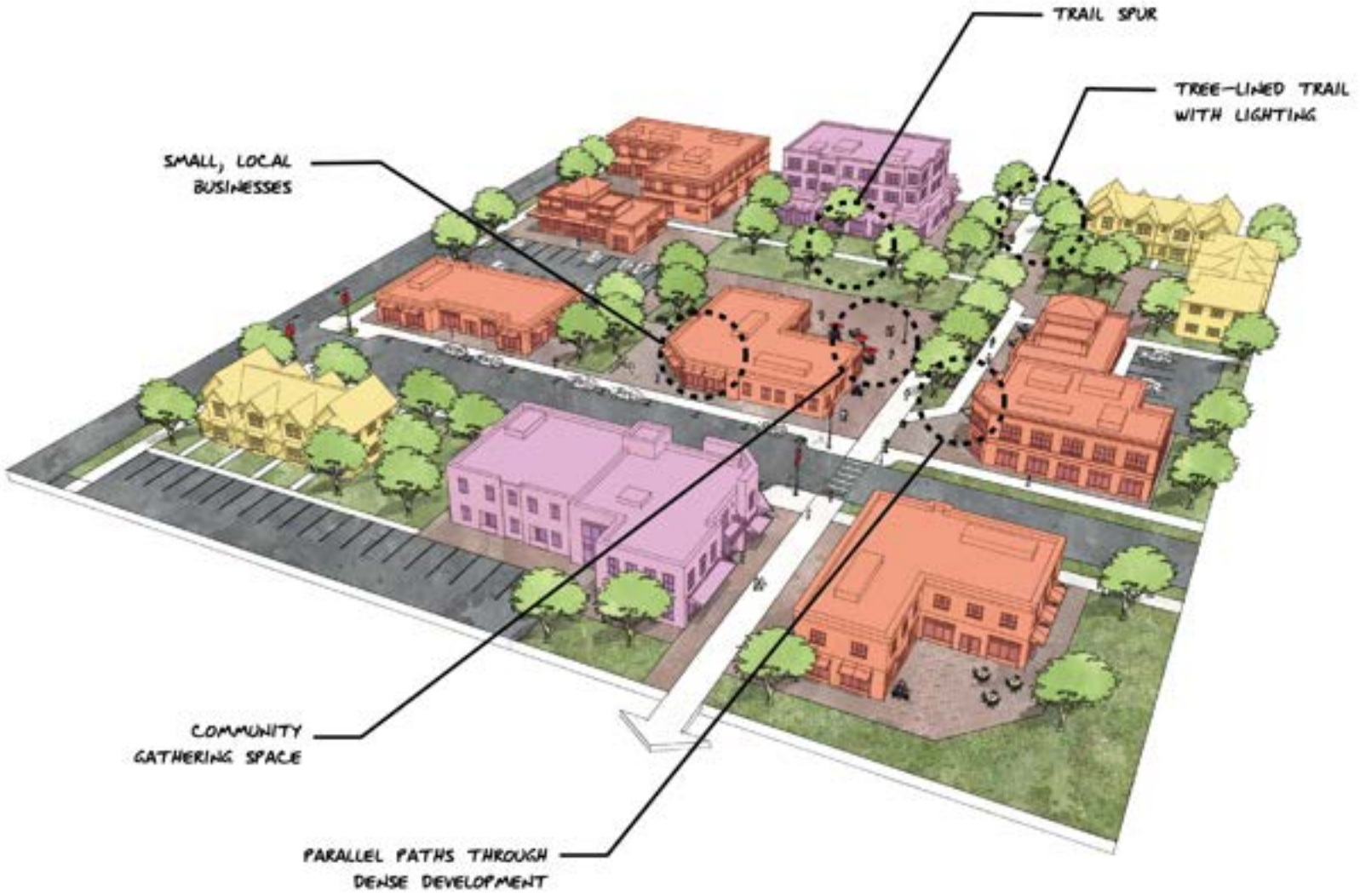
- **Land Use Mix:** Primarily small local businesses that serve the surrounding community and the occasional regional visitors.

Contexts

Urban: Restaurants, bars, local retail/markets, pocket parks, community centers, small event spaces, and other services.

Suburban: Restaurants, bars, local retail/markets, pocket parks, community centers, small event spaces, and other services.

Rural: Local retail/markets, farm stores, and small event spaces.



Legend

- LOWER DENSITY RESIDENTIAL
- MIXED-USE WITH RESIDENTIAL
- COMMERCIAL AND RETAIL
- MIXED-USE WITH OFFICE

CIVIC/EMPLOYMENT HUB

Commuter destination with a mix of job types.

The Civic/Employment Hub node is a commuter destination, containing a variety of jobs and services that primarily serve area employees during the week. This node may contain public and government services such as post offices, courts, and government offices, as well as hosting private offices. Public amenities and government offices are located closest to trail access, while private offices and retail are still visible and accessible. Entrances are oriented to the trail with semi-private facades that allow activation of the sidewalks while providing privacy for offices. Plaza spaces can provide social gathering, outdoor work spaces, and break areas for surrounding employees and visitors. Proximity to the trail encourages workers to commute without a vehicle and to walk and relax during breaks. Landscaping and pocket parks provide shade and peaceful spaces to rest, relax, spend lunch breaks, and take walking meetings. Parking should be located on the sides or rear of buildings, not adjacent to the trail. When parking does exist adjacent to the trail, it should be screened with engaging art or landscaping.

Unique Qualities

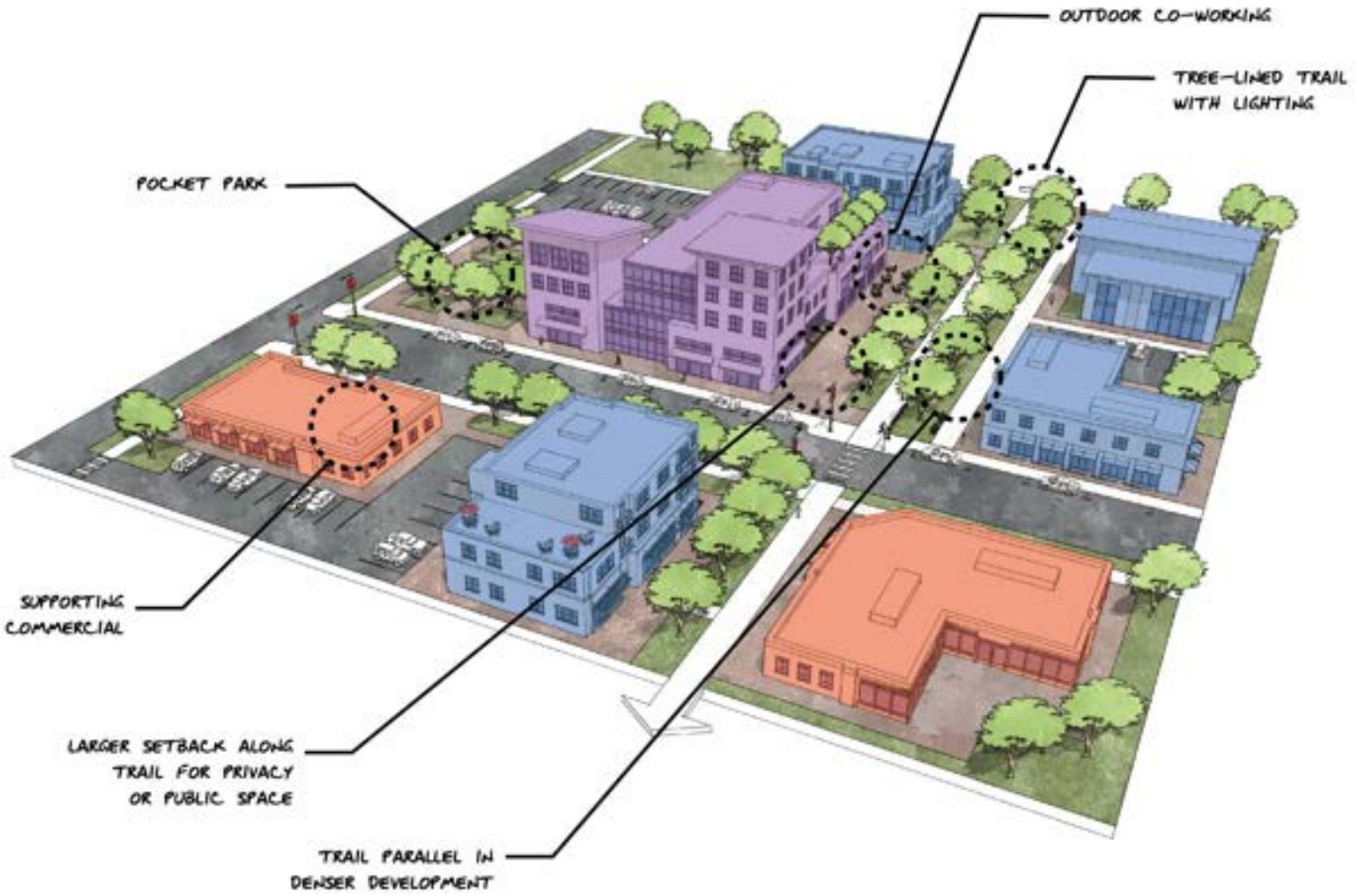
- **Land Use Mix:** Primarily civic and employment uses, with supportive commercial such as retail, restaurants, and daycares.
- **Bike/Scooter Parking, Share, and Repair:** Multimodal amenities that support commuters should be available, as well as bike and scooter parking near workspaces.
- **Seating and Passive Space:** Public spaces emphasize amenities such as shade, shelter, and seating that serve longer stays.

Contexts

Urban: A high concentration of public services and high-rise office buildings with supportive commercial and pocket parks.

Suburban: Business parks, technology centers, and government offices.

Rural: n/a



Legend

- MIXED-USE WITH OFFICE
- OFFICE
- COMMERCIAL AND RETAIL

COMMERCIAL/ENTERTAINMENT CENTER

Focus on goods and services with high visibility.

Commercial/Entertainment Center nodes attract both local and regional visitors for goods, services, events, and entertainment. The trail is highly visible, with maps and signage to direct visitors, and walkable spaces are well-protected from both vehicles and the elements through the use of landscaping, structural buffers, and limited roads and parking. Parking should be located on the sides or rear of buildings, not adjacent to the trail. When parking does exist adjacent to the trail, it should be screened with engaging art or landscaping.

Buildings directly adjacent to the trail provide at least one primary entrance facing the trail, with high transparency and active outdoor uses. The node is well-lit for safety and security at night. Taller buildings contain stepbacks that may be used as patios for upper story and rooftop activation. Large-scale venues like sports stadiums and zoos may include a branded trail spur directly to an entrance.

Unique Qualities

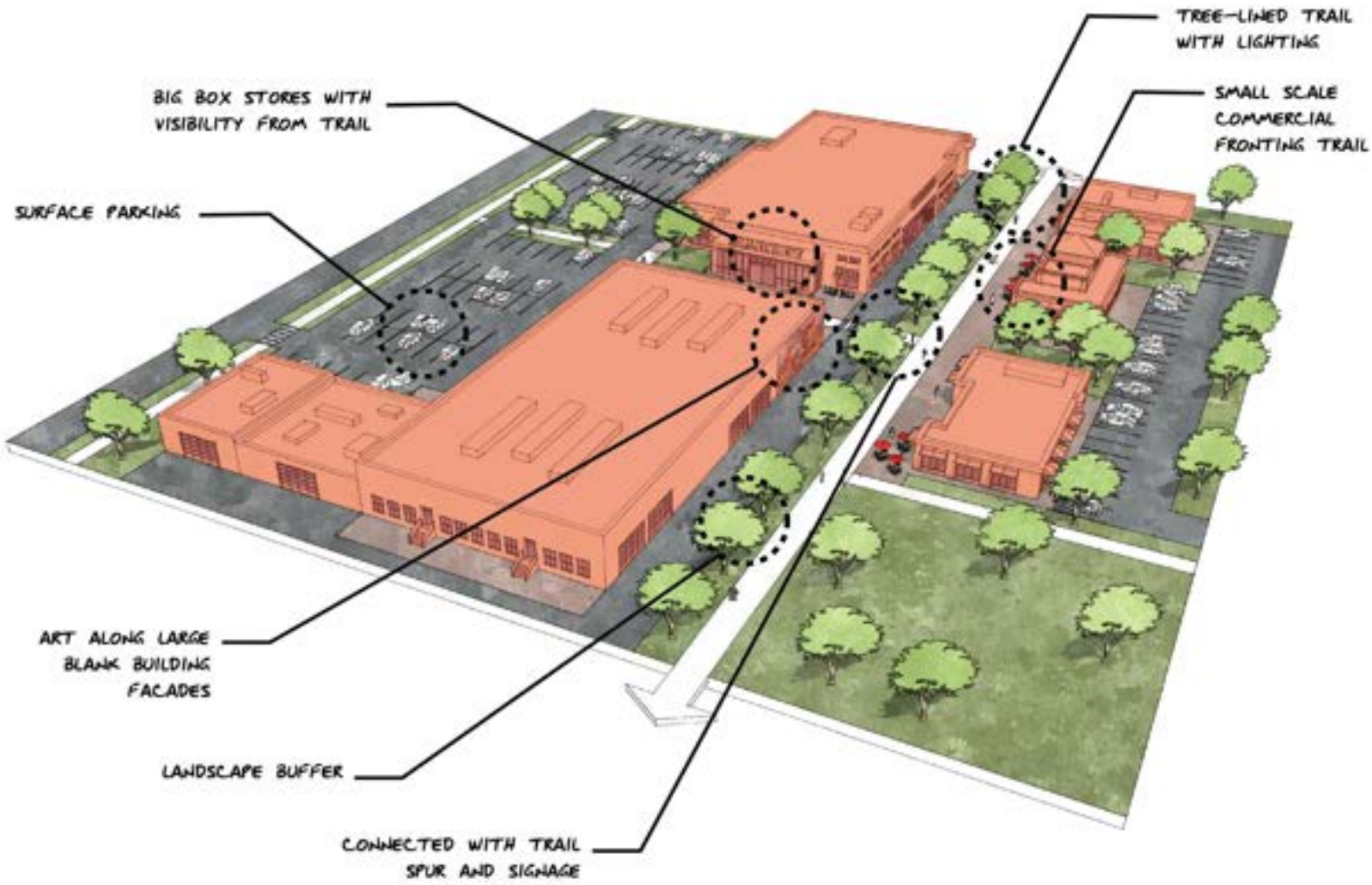
- **Land Use Mix:** Destination commercial and entertainment uses, can be large in format.
- **Trail Access, Site Orientation, and Parking**: When entrances aren't oriented towards the trail, ideally they are well connected with signage and trail spurs.
- **Visibility:** Should be highly visible from both the trail and nearby roadways to support commercial viability.

Contexts

Urban: Entertainment districts and major destinations.

Suburban: Shopping centers and entertainment destinations.

Rural: Fairgrounds and other regional destinations.



Legend

COMMERCIAL AND RETAIL

INNOVATION/MAKER PLACE

Indoor/outdoor engaging creative use of space.

Innovation & Maker Place nodes are centers of creativity, inspiring entrepreneurs, artists, and other makers to build and design. Uses might include business incubators, co-ops, art studios, light industrial, and creative offices. Buildings are likely to be adaptively reused from traditional light industrial uses and rely on shared public spaces that provide a place for flexible uses such as farmers markets, art fairs, food truck parks, and constructive or adventure play areas. Programming introduces people of all ages and abilities to new skills through educational programs and low-cost access to materials and tools.

The trail is visible and accessible from the node's central area and contributes to the activity and the node's creative and entrepreneurial character. Parking should be located on the sides or rear of buildings, not adjacent to the trail. Existing trail-adjacent parking that cannot be relocated should be screened from the trail with engaging art and landscaping and should be used as flex space for food trucks and pop-up events.

Unique Qualities

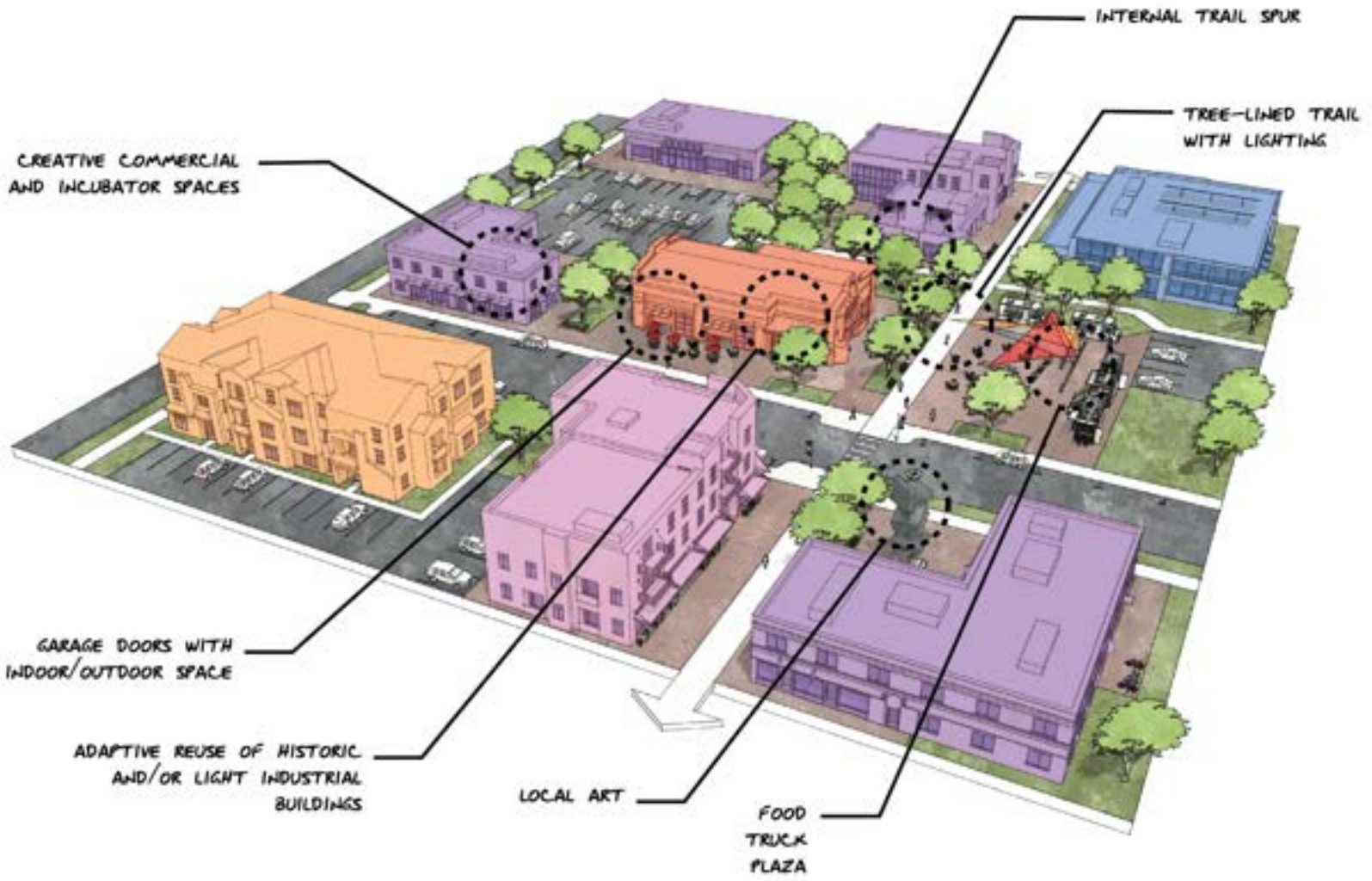
- **Land Use Mix:** Light industrial mixed use and flex spaces.
- **Trail Access, Site Orientation, and Parking:** Existing trail-adjacent parking that cannot be relocated used for flex space.
- **Ground Floors:** Flex and light industrial buildings with large rooms and high ceilings allow for creative use of space. Roll up garage doors allow improved access during warmer months.
- **Landscape and Public Art:** Art showcases the work of local makers.

Contexts

Urban: Centers around creative, commercial, and light industrial uses and creates regional destination and events.

Suburban: Serves local residents and workers in low-density and mixed-use neighborhoods, providing small-scale events.

Rural: May focus on skills-based and resource-based opportunities.



Legend

- HIGHER DENSITY RESIDENTIAL
- MIXED-USE WITH RESIDENTIAL
- COMMERCIAL AND RETAIL
- MIXED-USE WITH OFFICE
- OFFICE

MOBILITY HUB

Mobility hub at the junction of transit and trail-oriented development.

The Mobility Hub type is where transit-oriented development (TOD) and trail-oriented development (TrOD) come together, connecting transit with trails. Transit stops are buffered from vehicles and enhanced with shade, landscaping, wayfinding, and bike/scooter share and repair. Wayfinding signage and maps provide clear navigation between the trail and transit stop(s), direct to landmarks, provide destination travel times and distances, and real time arrival transit information. Parking should be located on the sides or rear of buildings, not adjacent to the trail. When parking does exist adjacent to the trail, it should be screened with engaging art or landscaping.

Unique Qualities

- **Land Use Mix:** Primarily public space that serves transit and mobility needs, with supportive commercial and residential uses.
- **Trail Access, Site Orientation, and Parking**: Strong access to trail, with commuter parking nearby.
- **Visibility**: Direct visual connections between trail and transit nodes.
- **Lighting and Security:** Well-lit for commuters at all times of day and emergency call buttons present.
- **Bike/Scooter Parking, Share, and Repair**: Bike and scooter sharing options, secure long-term bike parking, and repair stations are available.
- **Public Amenities**: Convenient amenities such as restrooms, water fountains, waste receptacles, charging, and seating.
- **Refuge and Shade:** Warming huts and heat lamps may encourage commutes during winter weather.

Contexts

Urban: May serve as node for multiple transit lines and/or trail intersections.

Suburban: Can include Park-and-Ride.

Rural: Can include Park-and-Ride.

Legend

- LOWER DENSITY RESIDENTIAL
- MIXED-USE WITH RESIDENTIAL
- COMMERCIAL AND RETAIL
- HIGHER DENSITY RESIDENTIAL
- MIXED-USE WITH OFFICE

RECREATION DESTINATION

Primarily parks and open space with an emphasis on environmental sensitivity.

A Recreation Destination node connects the TrOD trail with parks and open space and emphasizes environmental sensitivity. These nodes are often destinations for local and regional visitors, providing parking and transit access for visitors and seamlessly blending the trail and adjacent recreation opportunities through landscaping, park amenities (such as restrooms), branding, and signage. A Recreation Destination can also be a "blueway" trail along a waterway. Water access adjacent to trails should be provided when environmentally feasible. Lighting is minimal in open space settings beyond the trail itself to preserve the nature of the greenspace but more prominent in public park areas. Refuge from the elements, such as tree cover and shelters, serves both the trail and the destination. Parking should be set back from the trail with park/open space or utilize a visual landscape buffer.

Unique Qualities

- **Land Use Mix:** Primarily parks, public spaces, and nature preserves.
- **Trail Access, Site Orientation, and Parking:** Expanded parking may be located at or near these nodes, often serving as trailheads.
- **Landscaping and Public Art:** Landscaping reflects the character of the destination, either manicured or natural.
- **Lighting and Security:** Minimal lighting in natural areas outside of trail access points but expanded lighting in public parks. Motion-activated and dark sky lighting should be used.
- **Identity and Wayfinding Signage:** Signage should also serve trailhead and park entrance purposes, including providing park maps and information.
- **Refuge/Shade:** Shade is primarily from natural sources such as tree cover, but outdoor recreation amenities such as park pavilions or shelters should also be provided for year round coverage.

Contexts

Urban: May include zoos, urban parks, community spaces, and event centers, providing ample access to transit.

Suburban: Parks and recreation areas of all sizes, serving the local neighborhood and/or the larger community.

Rural: Typically oriented around a major destination or natural feature, such as a state park.


UNIQUE PROGRAMMING OPPORTUNITIES
LIMITED LIGHTING OUTSIDE ACTIVITY CENTER
PARK AND TRAILHEAD AMENITIES
CONNECTIONS TO OTHER TRAILS
PUBLIC RESTROOMS
SPORTS FACILITIES
SHADED TRAIL
SCENIC OVERLOOK, KAYAK/CANOE LAUNCH, OR FISHING PIER

HIGH DENSITY NEIGHBORHOOD

Multifamily, some attached single family with supportive commercial.

The High Density Neighborhood node is primarily multifamily buildings with some attached single family, public spaces, and supportive commercial. Transit and bike/scooter share options in the node provide valued mobility options for residents. Access to the trail is well-marked and located at neighborhood centers, although residences and businesses still acknowledge the trail by locating entrances and balconies along the trail. Ground floors engage with the trail through active uses, high transparency, energetic facades, and outdoor dining or exhibition in the setback space. Parking is located out of the trail setback.

Public spaces include play areas, gathering spaces, and ample tree cover. The public areas and trail access are well-lit, although at a pedestrian scale.

Trail access allows more residents to live nearby. Housing should prioritize affordable and equitable options.

Contexts

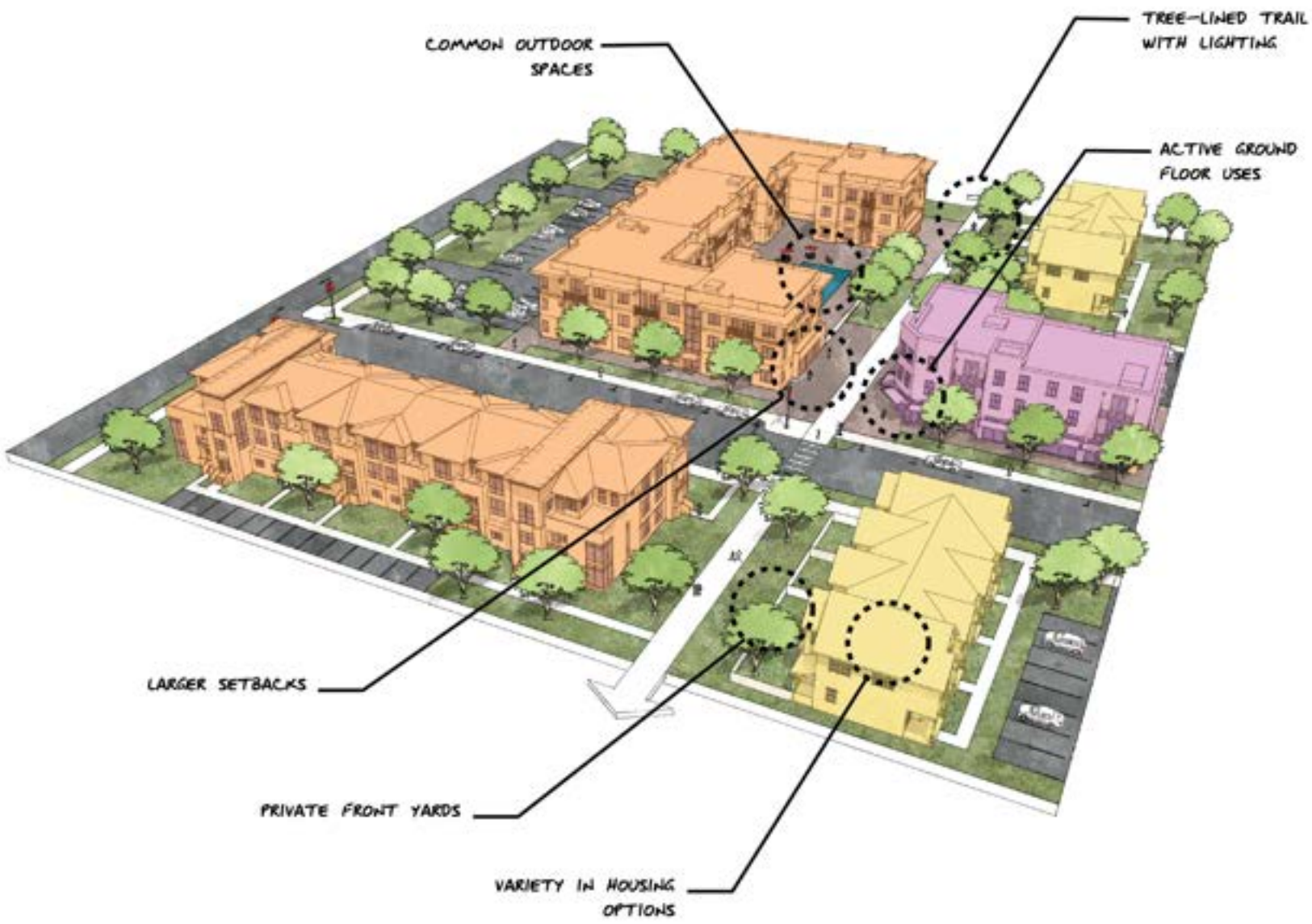
Urban: Primarily taller residential and mixed use buildings with structured parking.

Suburban: Primarily multi-family buildings and other forms of high to medium density housing.

Rural: n/a

Unique Qualities

- **Land Use Mix**: Primarily multi-family residential of various scales, with supportive commercial.
- **Ground Floors**: Entrances along the trail to ground floor residences should have public-facing elements such as stairs, stoops, and balconies. In mixed-use buildings, supporting commercial uses should be located on the ground floor and should be activated and oriented towards the trail.
- **Landscape and Public Art**: Neighborhoods should have landscaped, common-use open spaces that include art or relaxation opportunities.
- **Building Setbacks**: Setbacks may be greater to buffer residences from noise and visual impacts.
- **Lighting and Security:** Lighting should be pedestrian-oriented along sidewalks and trails, and should be considerate of residences.
- **Public Amenities:** May not include some amenities like restrooms.


COMMON OUTDOOR SPACES
TREE-LINED TRAIL WITH LIGHTING
ACTIVE GROUND FLOOR USES
LARGER SETBACKS
PRIVATE FRONT YARDS
VARIETY IN HOUSING OPTIONS
Legend
LOWER DENSITY RESIDENTIAL
MIXED-USE WITH RESIDENTIAL
HIGHER DENSITY RESIDENTIAL

LOW DENSITY NEIGHBORHOOD

Attached and detached single family and ADUs between nodes.

The Low Density Neighborhood TrOD type is a common use between other major nodes and includes primarily attached and detached single family homes, connecting residents with other nodes via trail. Public trail access is highlighted with signage that suits the intensity of the neighborhood.

Private yards may be separated from the trail through the use of fences, and setbacks. Fences provide long expanses of uninterrupted trail, ideal for exercise and long-distance trail users. Buffers between private property and the trail should include landscaping, tree cover, small playspaces, and/or exercise equipment.

Contexts

Urban: A mix of small lot single family and single-family attached residential, and public spaces.

Suburban: Primarily single family residential with passive space amenities and opportunities for refuge.

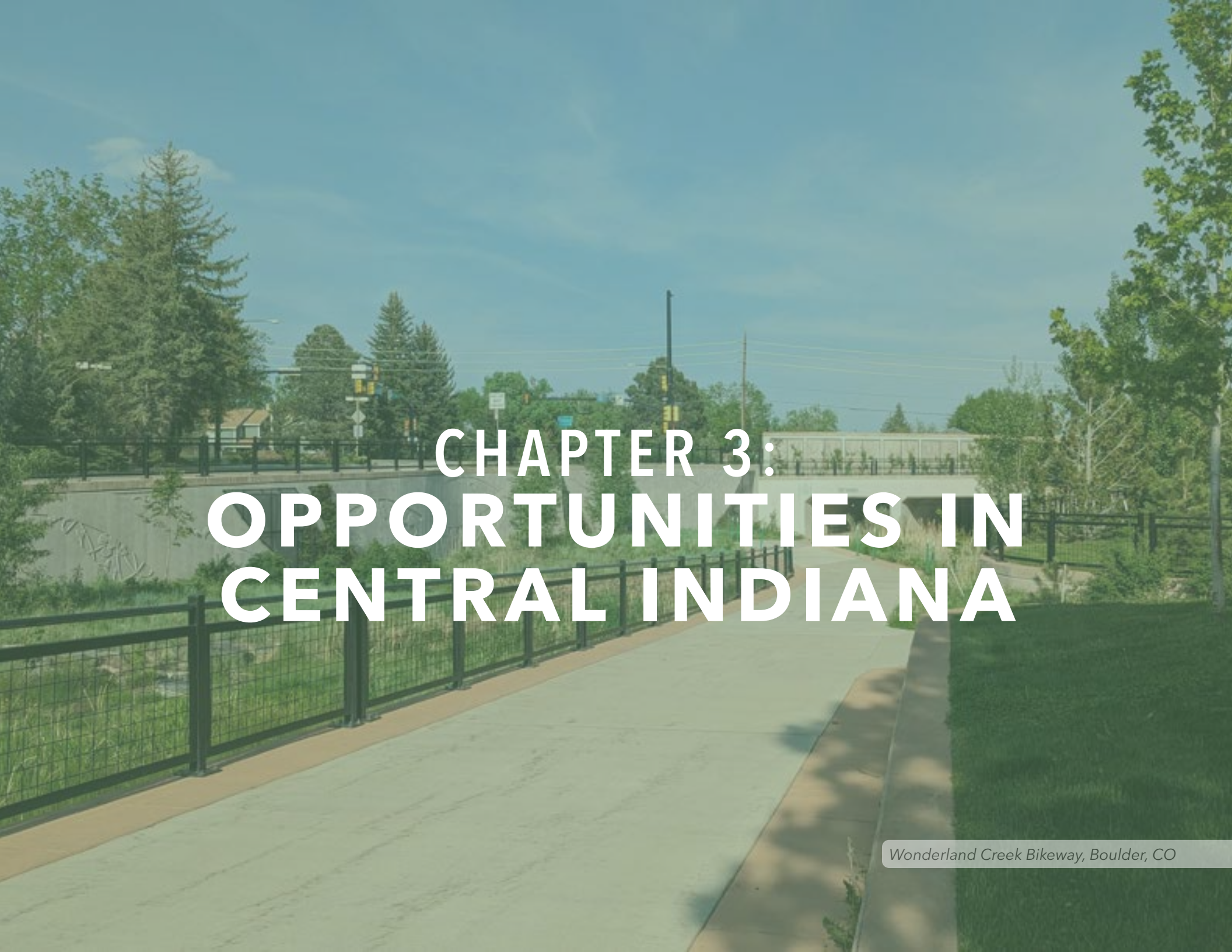
Rural: Large lot single family and agricultural uses. Development is clustered.

Unique Qualities

- **Land Use Mix:** Primarily low-density residential uses but can include low-intensity neighborhood-supporting commercial.
- **Trail Access, Site Orientation, and Parking:** Building frontage does not need to orient to trail. Trail access is provided but not disruptive. Public parking is generally limited to existing on-street parking.
- **Ground Floors:** Physical space and other privacy methods should buffer private residential units from the trail.
- **Visibility**: Visual and physical buffers should provide privacy between residences and the trail.
- **Building Setbacks**: Setbacks may be greater to buffer residences from noise and visual impacts. Side and rear setbacks on residential properties may be fenced for privacy per local setback regulations. Private and/or common gates accessing the trail should be encouraged.
- **Landscape and Public Art**: Small-scale monuments, signage, or art should indicate public trail access.
- **Lighting and Security:** Lighting should be pedestrian-oriented along sidewalks and trails, and should be considerate of residences.
- **Public Amenities:** May not include some amenities like restrooms, water, and waste collection.
- **Seating and Passive Space:** May have benches along the trail but not gathering spaces.

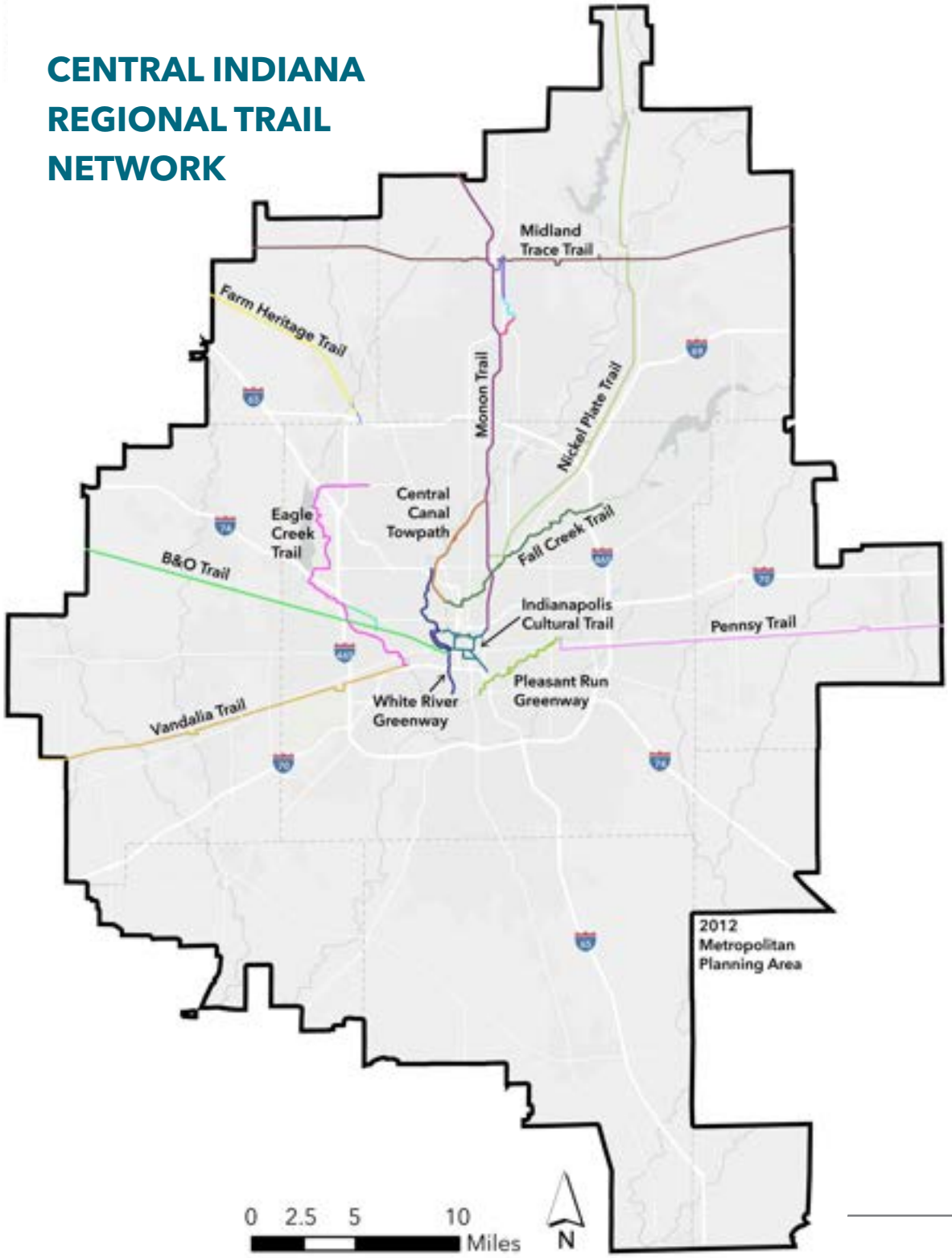
Legend

LOWER DENSITY RESIDENTIAL



CHAPTER 3:
OPPORTUNITIES IN CENTRAL INDIANA

Wonderland Creek Bikeway, Boulder, CO



REGIONAL TRAIL NETWORK

This study focused on Central Indiana's regional trails (trails that are longer and typically cross jurisdictions), amounting to over 234 miles, as listed below. This network consists of 13 major trails and a few significant connectors between them such as the Natalie Wheeler Trail and the Peoria Eastern Trail. As noted below, several of these trails are partially built with planned extensions that are in various degrees of completion. The regional trails generally form a spoke pattern, all connecting back in towards central Indianapolis. Trails are somewhat evenly distributed along the western, northern, and eastern portions of the region, but there is a noticeable gap in existing and planned trails on the southern portion of this area. There are approximately 6-8 major intersection points between the regional trails.

1. **B&O Trail** – 18.49 miles (partially unbuilt)
   Goes from Downtown Indianapolis northwest to Maplewood
2. **Central Canal Towpath** – 7.22 miles
   Follows the canal from north of Downtown Indianapolis north to Broad Ripple
3. **Eagle Creek Trail** – 16.15 miles (partially unbuilt)
   Goes generally north/south near I-465 along the east side of Eagle Creek reservoir

4. **Fall Creek Trail** – 11.3 miles
   Follows Fall Creek from north of Downtown Indianapolis to Fairwood Hills

5. **Farm Heritage Trail** – 24.36 miles
   Goes northwest from Zionsville through Whitestown to Thorntown

6. **Indianapolis Cultural Trail** – 7.8 miles
   Includes loops and spurs near Downtown Indianapolis

7. **Midland Trace Trail** – 27.41 miles (partially unbuilt)
   Goes east/west between Rosston and Lapel through Westfield and Noblesville

8. **Monon Trail** – 26.55 miles
   Goes north from Downtown Indianapolis up through Broad Ripple and Carmel to Sheridan

9. **Nickel Plate Trail** – 29.77 miles (partially unbuilt)
   Follows generally along I-69 from Indianapolis north through Noblesville up to Atlanta

10. **Pennsy Trail** – 18.89 miles (partially unbuilt)
    Goes east from Irvington to Greenfield

11. **Pleasant Run Greenway** – 6.68 miles
    Goes along the Pleasant Run Creek northeast to Irvington

12. **Vandalia Trail** – 19.27 miles (partially unbuilt)
    Goes southwest from Mt Jackson through Plainfield to Clayton

13. **White River Greenway** – 9.46 miles
    Follows the White River generally north/south to the east of Downtown Indianapolis

NODE MAPPING

During this study, the IMPO and MIG worked collaboratively on the initial identification of existing and potential TrOD nodes in the Indy Metropolitan Planning Area. This assessment is for informational purposes, with our findings shown on the map to the right. This included criteria development and a mapping methodology, summarized below.

1. IDENTIFY TrOD STUDY AREAS

As the basis for this analysis, existing and planned regional trail access points and intersections were used to create 1/2 mile radius areas.

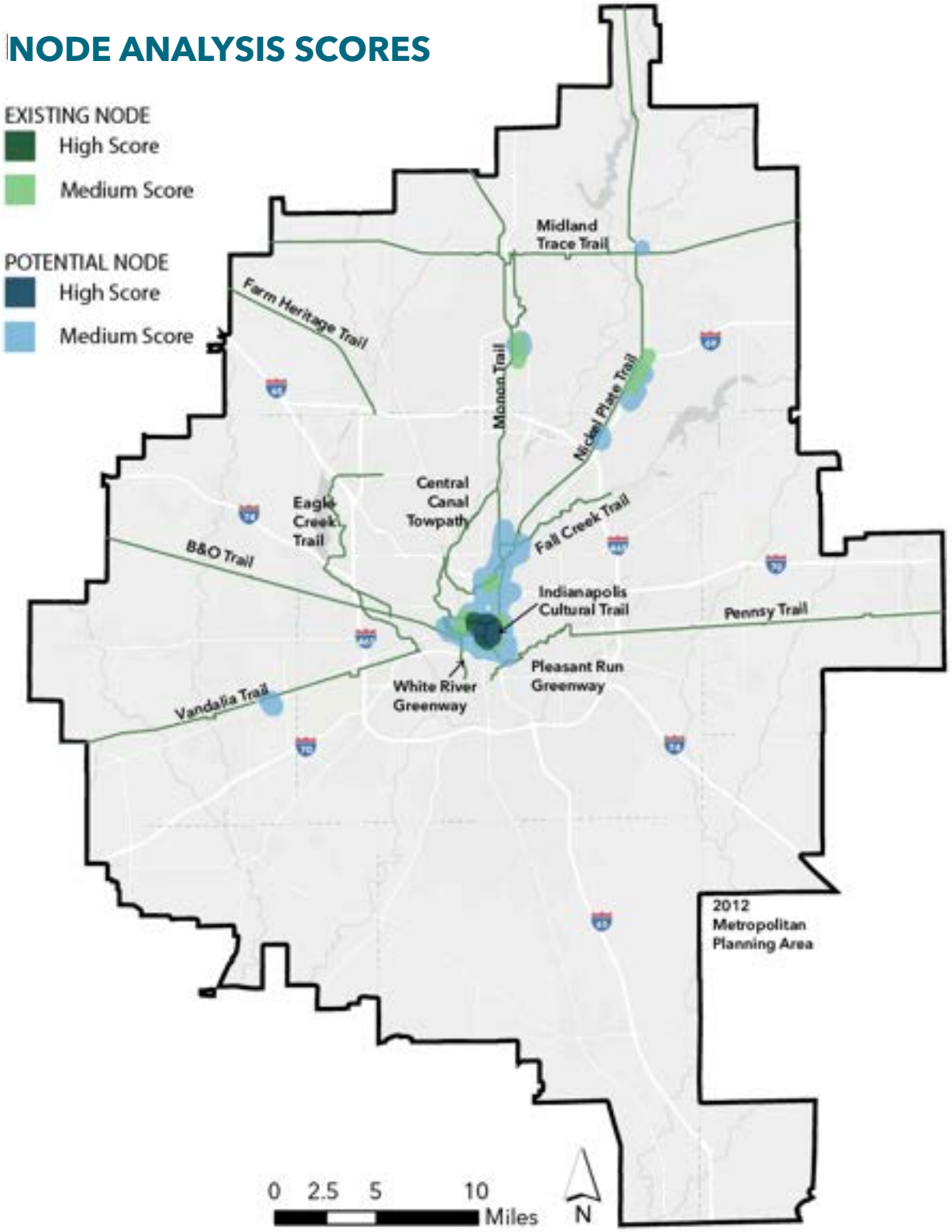
2. SCORE TrOD STUDY AREAS

Each study area was scored based on several criteria including activity level (population and employees), projected growth, walkability, bikeability, access to transit, redevelopment potential, and whether it is a regional activity center.

3. FILTER TrOD STUDY AREAS

This step of the mapping involved setting thresholds for filtering the TrOD study areas in order to identify the most representative existing nodes and best potential node opportunity sites. Site design criteria was also assessed to understand where the physical design of a site is actually in general alignment with TrOD guidelines for existing sites and what types of design changes would need to occur at potential TrOD sites. Design criteria included building proximity to the trail, building orientation, building/trail connections, signage, amenities, and trail crossings.

NODE ANALYSIS SCORES



DEVELOPMENT CONCEPTS

Four sites in Central Indiana have been studied as part of this effort to understand TrOD development potential through illustrative development concepts and high-level real estate analyses. The graphics on the following pages are purely conceptual, intended to envision and inspire what type and density of new TrOD could fit on different sites. They test the application of the TrOD design guidelines on real places in the region and further explore the uniqueness between the TrOD types. Included is an initial look at market feasibility, forthcoming potential economic and tax revenues impact. The four nodes studied include:

1. Cumberland (Pennsy Trail)
2. Whitestown (Big Four Trail)
3. 16 Tech (White River Trail)
4. Keystone (Nickel Plate Trail)

CUMBERLAND (PENNSY TRAIL)

EXISTING CONDITIONS

This area is located on the eastern side of Central Indiana between Washington Street and the Pennsy Trail. Currently there are large surface parking lots, big box stores, pad sites, and a utility site. The trail is hidden between the back side of these properties and the back side of single-family homes. Connections between the trail and surrounding uses are minimal. This does provide for a long uninterrupted stretch of trail which has some benefits for users.

DEVELOPMENT CONCEPT

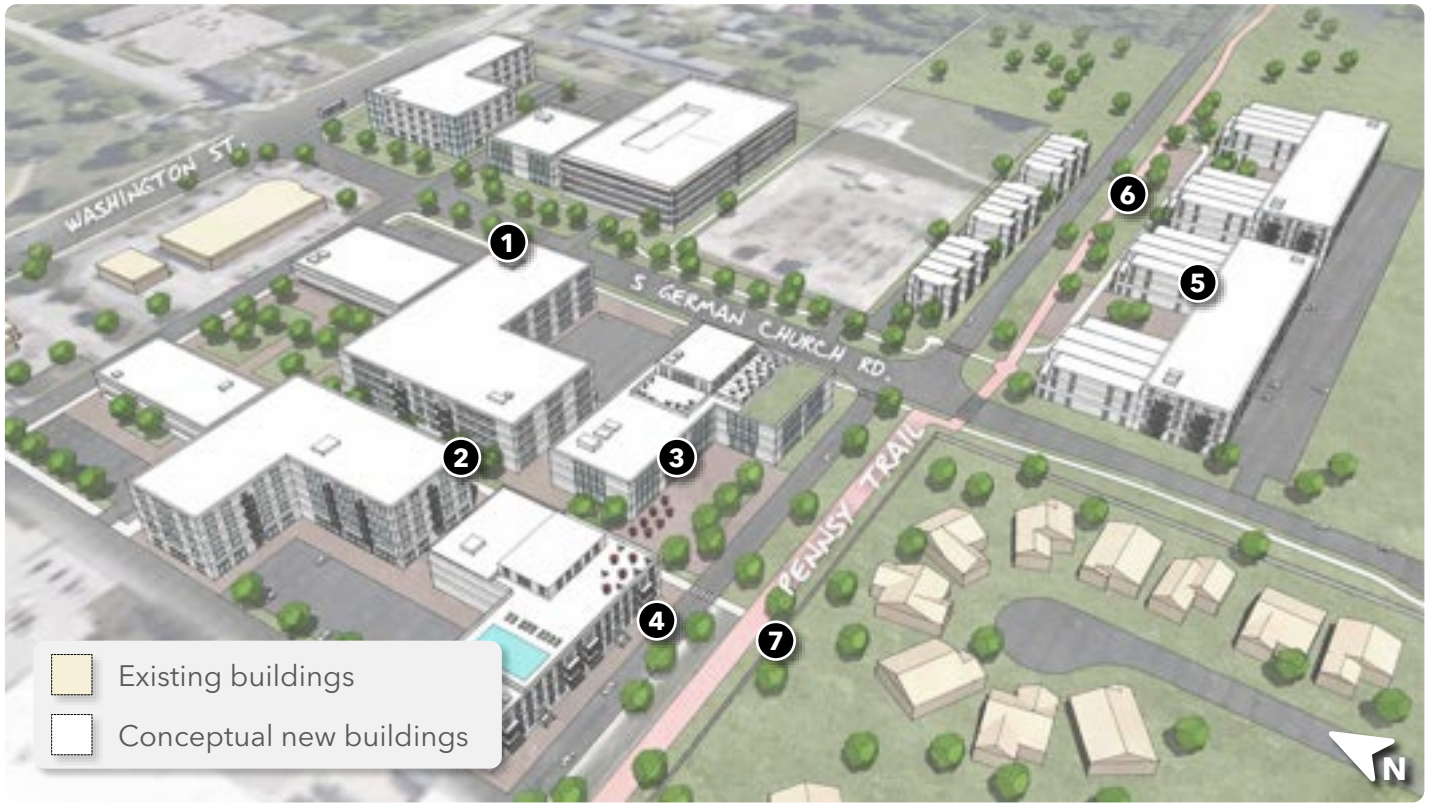
TrOD Type:
Vertical Mixed Use

Future Land Use

- Node is primarily vertical mixed use and commercial/entertainment
- Multi-family residential should be predominant land use in mixed-use buildings
- Transitions to existing single family residential
- Potential for structured parking

Technical Advisory Committee Support for Concept

4.1 out of 5 stars



CONCEPT HIGHLIGHTS

1. Building visibility from both trail and major roads
2. Internal green corridor
3. Public plaza and active ground floors fronting trail
4. Narrow frontage road with safe crossing
5. Private outdoor space and trail-oriented residential with privacy
6. Parallel path connecting residential
7. Gates allowing neighborhood trail access

CUMBERLAND MARKET SNAPSHOT

Trade Area

Six-mile buffer to capture goal of a comparison / entertainment district.

Development Pattern

Predominant built form of single family residential development, with retail and commercial uses located along East Washington Street. Stable community with a population growth of 0.61%, steady housing stock production, and a median home value nine percent lower than that of Indiana.

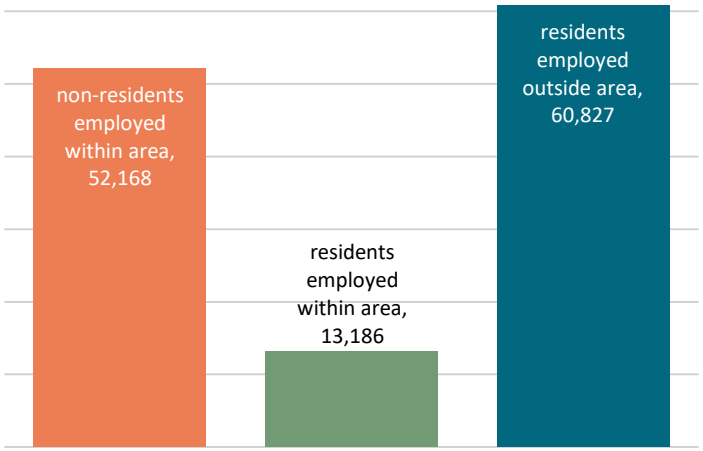
Initial Observations

The vacancy rate and absorption of this use are both zero, signifying a lack of market velocity, where the demand and supply of available space is at an equilibrium. In this case due to long-term lease holders and the lack of market production of space. The surrounding area is affordable with a significant presence of families, pointing to potential demand for specific housing and retail uses.

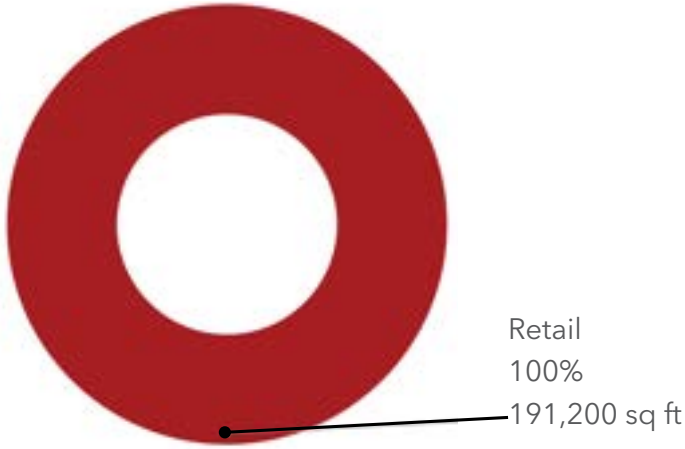
POPULATION HIGHLIGHTS

Trade Area Total	***Density (per sq. mi.)***
200,041	1,391
Housing Units	***Household Size***
86,569	2.58
Median Age	***Median Income***
36	$51,224

Employment & Jobs



Market Inventory



Market Rent

EYE-LEVEL PERSPECTIVE

Existing

Mixed uses with active ground floors

Concept

Path connecting to residential areas

Play and gathering spaces

Narrow road with safe crossing

WHITESTOWN (BIG FOUR TRAIL)

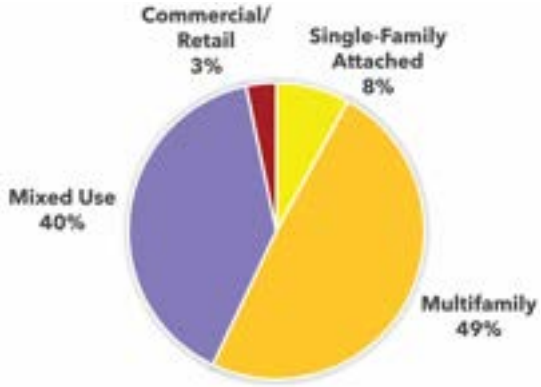
EXISTING CONDITIONS

Whitestown is located in the northwestern area of Central Indiana. The Big Four Trail crosses Main Street right by Downtown on a diagonal alignment. Currently buildings primarily back onto the trail and there is surface parking along it. There is one small public space that provides seating and bike parking for trail users. Surrounding land uses are mixed in use and low density (1-2 stories).

DEVELOPMENT CONCEPT

TrOD Type:
Main Street Connector

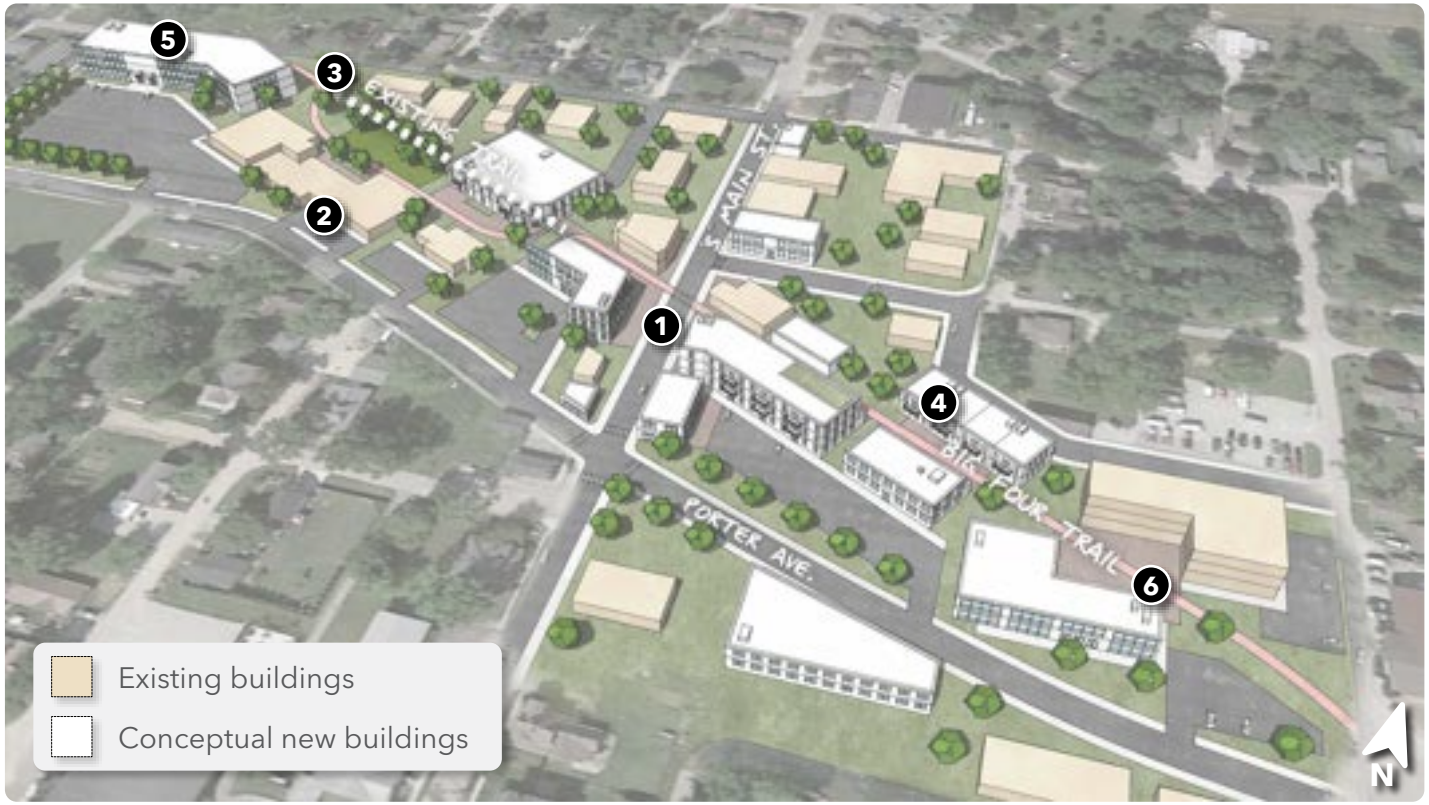
Future Land Use



- Commercial/retail to contribute to downtown economy and amenities
- Residential density to add more people near downtown
- Vertical mixed use to highlight the downtown/trail intersection and provide visual connectivity

Technical Advisory Committee Support for Concept

4.2 out of 5 stars



CONCEPT HIGHLIGHTS

1. Focused activity on Main Street and trail intersection
2. Trail-side facade improvements, adaptive reuse, and infill complementary to existing density and character
3. Realign existing trail to accommodate infill
4. Activated frontages facing the trail
5. Added density to support the downtown
6. Public and/or private plaza spaces along trail within node

WHITESTOWN MARKET SNAPSHOT

Trade Area

Whitestown Town Boundary to capture the suburban district.

Development Pattern

Predominant built form of single family residential development surrounding a small locally serving downtown of both retail and industrial commercial uses. There is little to no multi-family housing or office space in the immediate surrounding area. Fast growing, community with a population growth of 5.09% and 75% of housing stock built since 2000. The median home value is 36% higher than that of Indiana.

Initial Observations

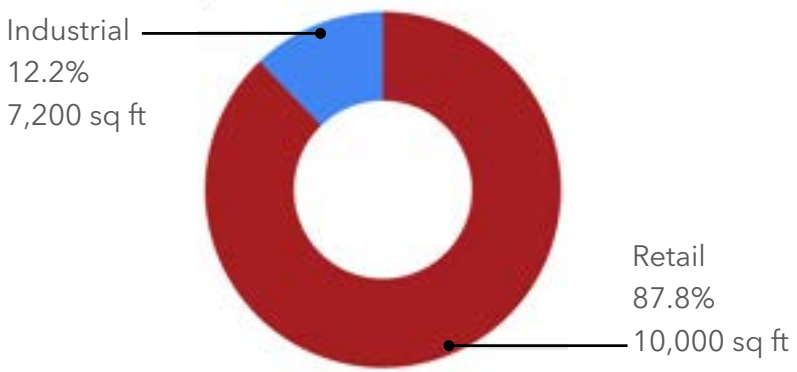
Both the vacancy and net absorption are zero for commercial uses. The zero net absorption and vacancy rate signify a lack of market velocity, where the demand for space is equal to the supply of available space. The town is quickly growing, particularly for college-educated families, showing the potential demand for mixed-use and multi-family development alongside appropriately-scaled and complementary retail and commercial development.

POPULATION HIGHLIGHTS

Trade Area Total	***Density (per sq. mi.)***
15,512	320
Housing Units	***Household Size***
5,702	2.77
Median Age	***Median Income***
35	$105,244

Employment & Jobs

Market Inventory



Market Rent

EYE-LEVEL PERSPECTIVE

Existing

Mixed use with active ground floors

Concept

Realigned existing trail with crossing improvements

Trailside facade improvements and infill development

Active public spaces and building design highlight intersection of trail with the main street

16 TECH (WHITE RIVER TRAIL)

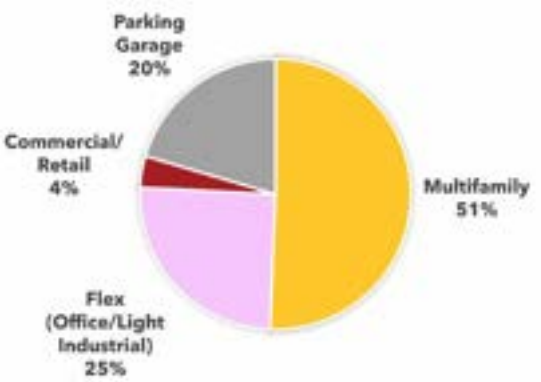
EXISTING CONDITIONS

The 16 Tech area is just west of Downtown Indianapolis. This site falls between Indiana Avenue and the White River. Current uses include the 16 Tech complex (offices, coworking, food hall, etc.) and other office, light industrial, and utility uses. There is also a structured parking garage on site. The trail is prominent on a berm but buildings and open spaces are not organized around it. Connections between the trail and surrounding uses are minimal.

DEVELOPMENT CONCEPT

TrOD Type:
Innovation/Maker Place

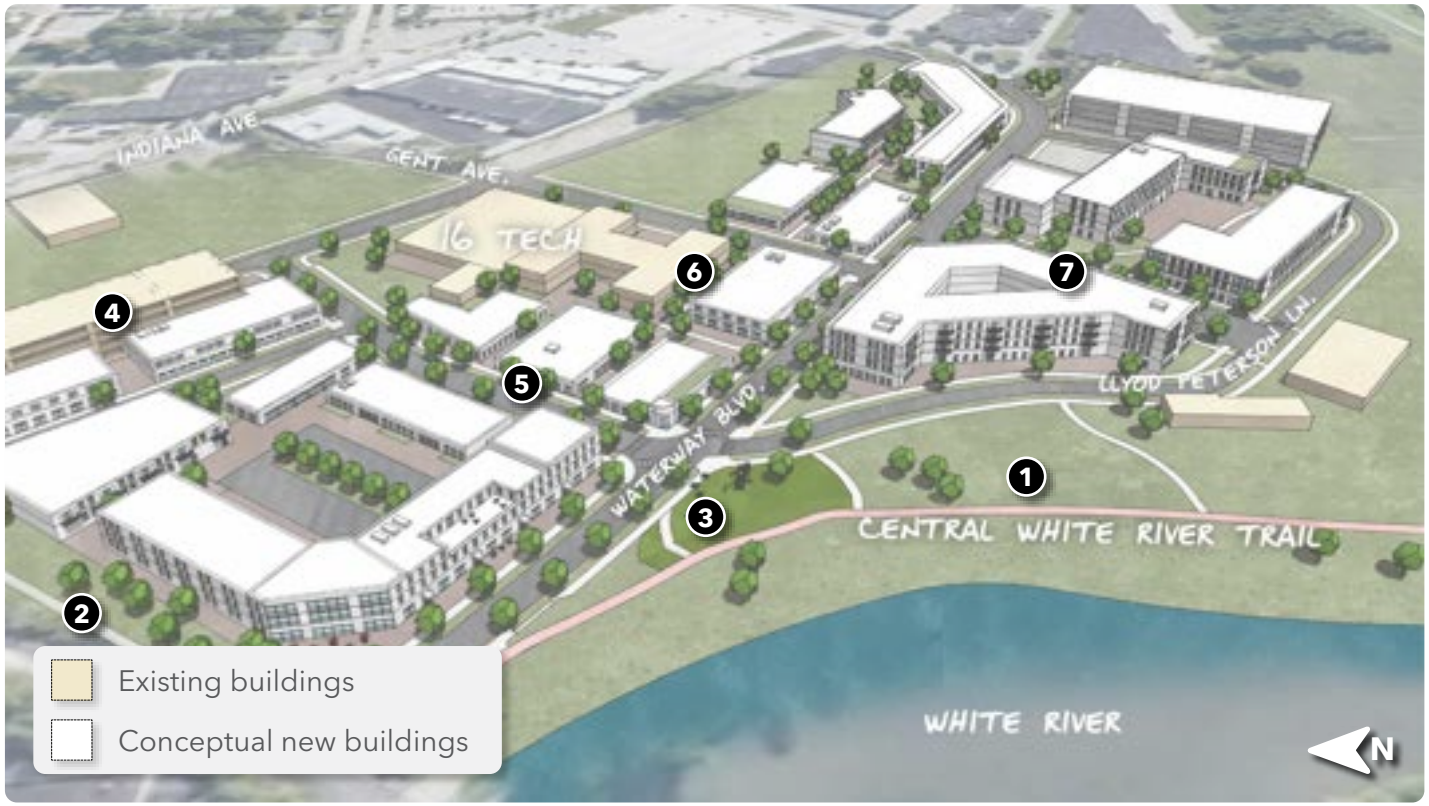
Future Land Use



- Core uses are medium density flex, adaptive reuse, innovation, and light industrial mixed use
- Residential density to support employment center
- Retail/commercial focused along trail to complement food hall
- Structured parking

Technical Advisory Committee Support for Concept

3.9 out of 5 stars



CONCEPT HIGHLIGHTS

1. Buildings with active ground floors, upper story stepbacks, and plazas facing trail
2. Trail spur along rail corridor
3. Public park/open space along trail to provide outdoor access
4. Wrapped parking garage
5. Internal streets with on-street parking
6. Internal trail network
7. Supportive nearby density

16 TECH MARKET SNAPSHOT

Trade Area

One-mile to capture its walkable density.

Development Pattern

Mixed built form of industrial, commercial, and office with additional assets nearby given proximity to downtown and investment in the innovation district. This development pattern demonstrates a trend of intensification throughout the study area. Young population with a 1.35% population growth and just 19% of housing stock built since 2000. The median home value is 82% lower than that of Indiana.

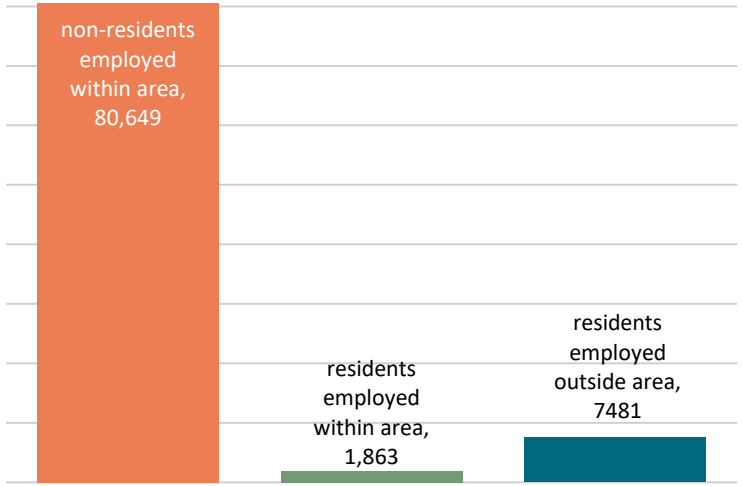
Initial Observations

The vacancy rate for office, flex, and industrial are all zero, yet with a negative absorption for office (-36,800 square footage) demonstrating a decrease in occupied commercial space. This can indicate a potential decline in demand and a surplus of unoccupied properties. Absorption for the remaining uses is zero. The surrounding area is young, densely populated, and close to downtown, calling for a diversity of housing stock in close proximity to work opportunities, potentially for a live/work district that complements the innovation district.

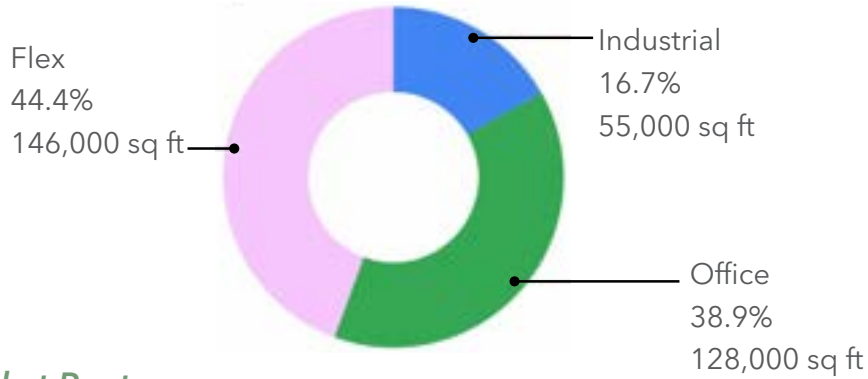
POPULATION HIGHLIGHTS

Trade Area Total	***Density (per sq. mi.)***
28,596	3,023
Housing Units	***Household Size***
15,105	2.03
Median Age	***Median Income***
30	$46,711

Employment & Jobs



Market Inventory



Market Rent

EYE-LEVEL PERSPECTIVE

Existing

Parks and open spaces

Context-appropriate public art

Concept

Buildings with active ground floors, upper story stepbacks, and plazas facing trail

Mid-block crossing with enhanced visibility

Flexible gathering spaces and plazas

Trail spurs with maps and information

KEYSTONE (NICKEL PLATE TRAIL)

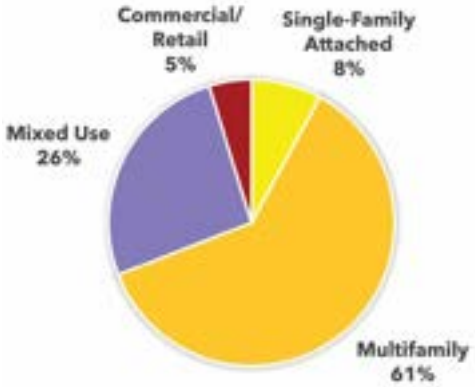
EXISTING CONDITIONS

The Keystone corridor runs north/south out of Downtown Indianapolis and is crossed by the Nickel Plate Trail (under construction) on a diagonal alignment. This site is surrounding the intersection of Keystone Avenue, Willowbrook Parkway, and East 49th Street. Current uses include primarily offices, auto-oriented retail, and single-family residential. The six-lane corridor is slated for enhanced transit services in the future. Connections between the trail and surrounding uses are minimal.

DEVELOPMENT CONCEPT

TrOD Type:
Mobility Hub

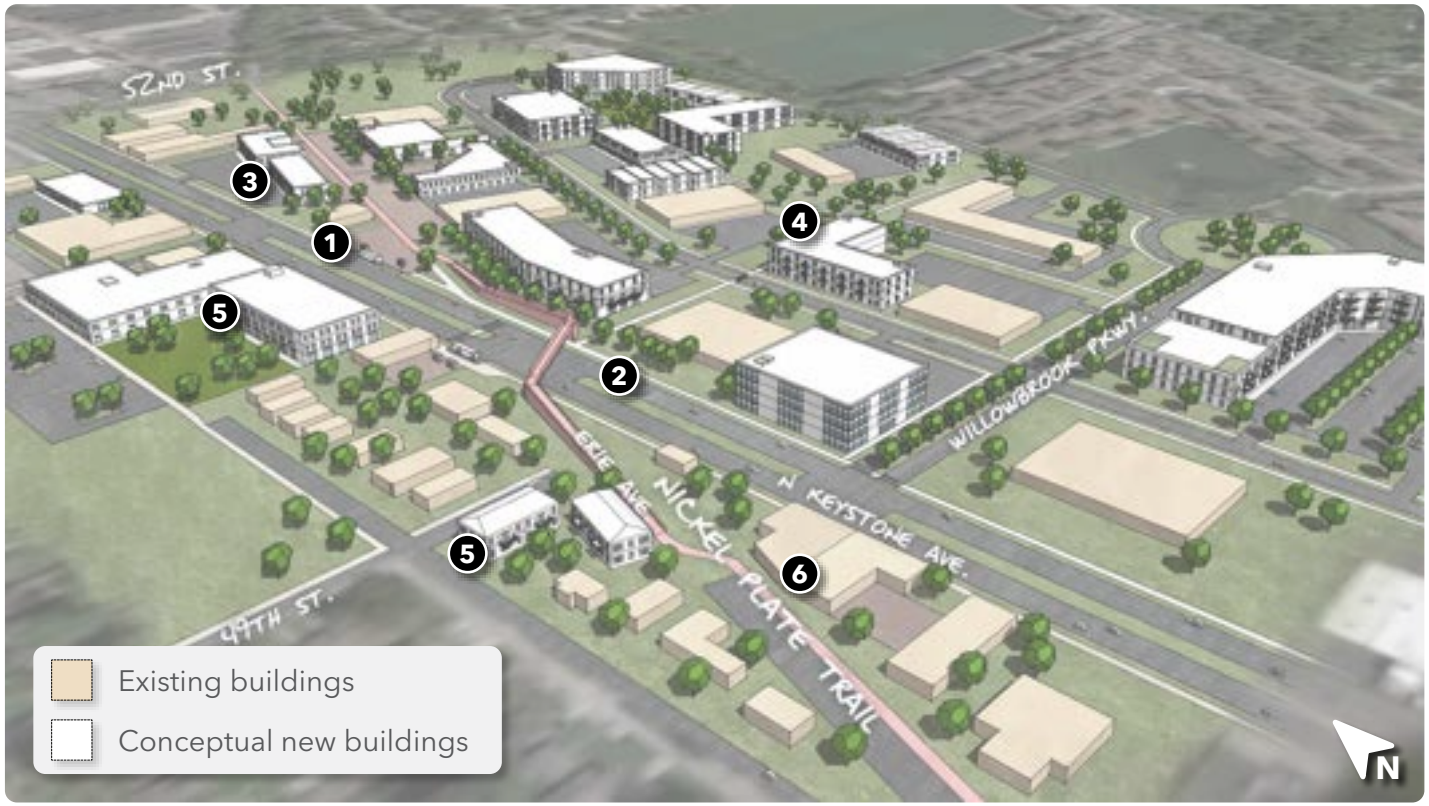
Future Land Use



- Vertical mixed use and commercial along trail
- Supportive residential infill near trail connected by spurs
- Preservation of existing local businesses
- Transition to adjacent existing residential

Technical Advisory Committee Support for Concept

3.75 out of 5 stars



CONCEPT HIGHLIGHTS

1. Transit stations on either side of trail/ street intersection and mobility hub amenities
2. Pedestrian bridge over arterial street
3. New buildings orient towards trail rather than roadway with active ground floors and setbacks
4. Office park/dispersed residential area infilled
5. Infill along roadway visible from trail
6. Added density but sensitive to existing character

KEYSTONE MARKET SNAPSHOT

Trade Area

Three-mile Buffer (Census Tracts) to capture its mobility accessibility.

Development Pattern

Predominant single family residential development with a mix of office, retail, and industrial uses along the major road networks (namely North Keystone Avenue and East 46th Street). Stable community with a population growth of 0.48% and 95% of housing stock built before 2000. The median home value is 20% higher than that of Indiana.

Initial Observations

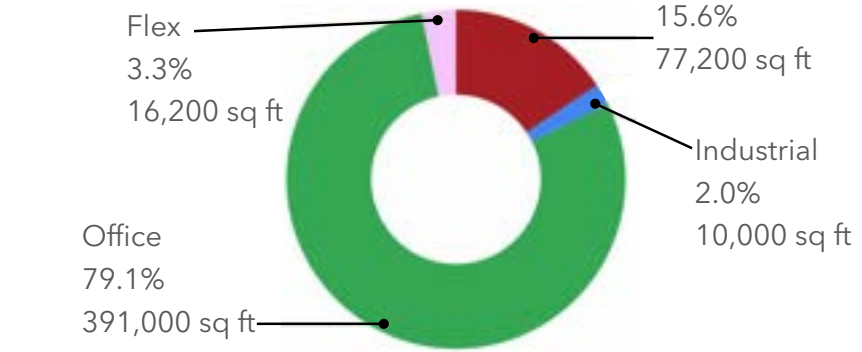
The vacancy rate for retail, office, and flex is quite high, and the net absorption is zero for all except for office (+5,200 square feet) and retail (-3,800 square feet), showing a relative lack of market velocity and demand. The area is relatively dense with an established mix of families and other households with good mobility access. Lack of recent housing growth shows the potential demand for additional housing production alongside complementary retail.

POPULATION HIGHLIGHTS

Trade Area Total	***Density (per sq. mi.)***
112,030	3,170
Housing Units	***Household Size***
56,669	2.21
Median Age	***Median Income***
38	$58,443

Employment & Jobs

Market Inventory



Vacancy Rate

EYE-LEVEL PERSPECTIVE

Existing

New buildings orient towards trail with active ground floors

Concept

Mobility hub

Clear delineation between trails and sidewalks

Pedestrian bridge over arterial street

CHAPTER 4:
IMPLEMENTATION

Rail Trail, Charlotte, NC

OVERVIEW

This Implementation section is intended to provide guidance for municipalities, developers, property owners, and other stakeholders to help overcome common barriers in making TrOD visions a reality and key considerations for important proactive efforts to avoid potential negative outcomes. Organization of this section is as follows:

OVERCOMING BARRIERS TO TrOD

- Market
- Environmental
- Regulatory
- Administration
- Design
- Social

PROMOTING NODAL DEVELOPMENT

- Preserving Natural Trail Experience
- Focused Activity Centers
- Conflict Management and Safety

EQUITY AND AVOIDING DISPLACEMENT

- Potential Equity Impacts of TrOD
- Environmental Justice Areas
- Proactive Equity Strategies

TOOLKIT SUMMARIES

- Operations and Management
- Programming
- Finance

OVERCOMING BARRIERS TO TrOD

Barriers to TrOD identified during this process can generally be categorized into six categories, including: Market, Environment, Regulatory, Administration, Design, and Social. These different types of barriers can interfere at any point in the process of trailside development, although impacts may be more relevant in some locations than others. The context of TrOD must also be considered when evaluating barriers and the development feasibility and/or continued success of an area. Urban areas have different needs than suburban or rural areas. This section includes specific strategies and actions that may help municipalities and developers anticipate and overcome these typical barriers.

MARKET

Typical Barriers

- Trails are Central Indiana's "waterfront" property. In some areas this is very evident, but in other areas the potential has not been realized. Because of this, property values are already high or should be expected to grow. High property values can limit developability, especially for affordable housing.
- In areas where property values are likely to rise, long-term residents and legacy businesses often have concerns that they may be priced out of the area. Ideally, existing residents and businesses have avenues to stay in place and benefit from the increased value added by one or more trails. However, in some cases small and medium mixed-use buildings can be developed as infill along trails and provide replacement space for these residents and businesses, thus "knitting the area back together" and contributing to economic development.

Variations by Context

The real estate market is the prime driver of new development, as well as a potential barrier to implementation. In rural and less developed areas, the lack of existing comparable options nearby frequently impairs developers' willingness to take a risk on new development types and/or a bank's willingness to finance a proposed project. Denser areas often already contain comparable properties that include elements of TrOD (intentional or not).

The real estate market varies across the region, but it is generally stronger along the regional trails, especially in places passing through downtowns and other commercial or mixed-use areas, than it is along the smaller trails.

Low-income areas are at greater risk for gentrification and displacement. These areas often have a lower cost to purchase and develop, making them more attractive to developers than higher-income areas. These can occur in any context, but may vary in form.

Recommendations

- Offer local grants and incentives to help offset financial limitations. Consider the use of tax incentives such as abatements, payment in lieu of taxes, Community Improvement Districts (CIDs), and other strategies to attract development in areas with low development potential or high property costs. (See Finance Toolkit for more specifics.)
- Work with one or more "preferred" lenders to establish an understanding of TrOD potential and benefits; coordinate on one or more loan products to support TrOD.

- Support BIPOC/minority-owned businesses and programming for existing minority communities in areas vulnerable to displacement. (See Proactive Equity Strategies section on page 86.)
- Encourage affordable, workforce and senior housing developments, and other projects with the potential for subsidies, especially in areas currently experiencing high or increasing property values to ensure diversification of population and promote access to trails.
- Utilize design review processes when federal funding is used, which can provide flexibility on the part of the local government in mitigating any regulatory conflicts as well as provide the opportunity for further incentives.

ENVIRONMENT

Typical Barriers

- Much of the available land along trails (especially those along of replacing rail lines) is or has been occupied by industrial uses that may have contaminated the site. Remediation of brownfield sites increases costs and project timelines, reducing interest in and/or feasibility of development.
- Many trails run along waterways. As a result, floodplains can be a major impact on project feasibility, affecting financing, insurance, construction, and design/function. The additional oversight and regulation on projects within floodplains limit the developable area, uses and design of a development project.
- The preservation of the existing mature tree canopy is often a major goal for communities (and sometimes developers), but this can impact the feasibility of projects. In particular, developers are often required to preserve invasive species of trees, even when they may limit developable space and could be replaced elsewhere on site with native species.
- Existing geographic conditions such as grade changes require design solutions that may limit the development's footprint or require additional expertise for mitigation.

Variations by Context

The types of environmental constraints are similar throughout the region, with trails often running along waterways and/or rail corridors. Urban settings may have already mitigated flood risks but can have more historically industrial uses. Suburban and rural areas may require greater setbacks from trails and space between development, which can result in less impact from floodplains and brownfield sites.

Recommendations

- Proactively designate areas of existing environmental concern with limited development potential (whether a floodplain, contaminated, or geographically difficult area) as public or publicly-accessible passive space for respite, recreation, or conservation.
- Ensure permitted uses along trails do not include potential for contamination. Repurpose trail-adjacent properties from industrial uses whenever possible as properties are redeveloped.
- Allow for gradual tree canopy replacement from invasive to native species. Prioritize areas of the trail for "natural" settings where tree canopy should only be modified after a trees natural life cycle.
- Utilize grade changes for unique design of buildings and public spaces.

REGULATORY

Typical Barriers

- Parking provisions frequently tends to be an issue, although it tends to vary by context. In some places, existing parking lots and minimum parking requirements prevent infill development along trails. In others, parking needs to be preserved to support adjacent uses and trail users.
- Development can be more difficult on sites with more regulations, such as near railroads, within federal or state jurisdiction, challenging emergency access, etc.
- Although often preferred along trails, residential and a variety of commercial uses are not always allowed by right within local regulations, limiting permitted uses that could be successful in a TrOD setting.
- TrOD zoning overlays can help ensure a community's vision for TrOD is realized and widen the breadth of uses and designs that may not otherwise be permitted by underlying zoning. They can also provide a more streamlined project approval process and other incentives. However, zoning overlays can also include expanded development requirements, which may extend timelines or result in more legwork for developers. Overlays should be implemented carefully and follow a master plan for areas along the trail.

Variations by Context:

Regulatory barriers vary by governing authority, which may choose to employ varying types and intensities of regulatory tools. Some municipalities rely on their zoning codes or even trail-specific overlays, while others tend to rely on a combination of trail-oriented master planning, Planned Unit Development (PUD), and design review, and others still have not yet begun to adopt trail-oriented regulations for incoming development. The type of regulation corresponds more with a municipality's unique policy direction and regulations than with size or capacity, although the timing may impact this as well – as zoning codes age and are subsequently updated, TrOD supportive changes may be easier to integrate.

Recommendations

- Limit the use of PUDs on properties adjacent to trails to maximize predictability for developers. If a PUD is allowed adjacent to a trail or within a TrOD node, TrOD requirements should apply regardless.
- Utilize two categories of zoning, overlay, or design regulation:
  - » Urban/nodal, an area in which design and use encourages density and activation of the trail, and
  - » Rural/natural/intermediary, an area in which more passive uses such as recreation, respite, and commuting are encouraged through trail-friendly design and less intense uses.
- Offer some flexibility for projects that need to adhere to trail-related guidelines, such as providing extra trail-related amenities when parking requirements can't be met, or installing nearby trail-related safety measures when a direct connection to a trail can't be provided. However, such flexibility would need to be carefully defined and monitored, perhaps by additional committee, authority, or as a specific list of alternatives.
- Relax parking minimums (or utilize parking maximums) and increase permitted density directly adjacent to trail to promote active modes of transportation along trails. In areas in which parking must be provided, focus parking away from trail frontages.

ADMINISTRATION

Typical Barriers

- The approval process for development projects can be slowed by design review, additional requirements, and the tendency to use PUD processes for TrOD. However, it should be noted that the design review process can also be leveraged to provide incentives, solicit community benefits, and provide greater flexibility.
- This results in a lack of cohesion and quality that can impact the function of the trail and have ripple effects on surrounding development.
- Although funding is frequently available for the design and construction of new trails, it is very difficult to obtain funding for the maintenance and operations of existing trails. Sometimes this requires creative funding solutions such as developer contributions or carefully crafted maintenance projects with a capital improvement approach.
- Maintenance activity and vehicles can conflict with users and create blindspots.

Variations by Context

Typically, regional trails and rights-of-way are maintained by individual jurisdictions regardless of context. Regarding development administration, this tends to vary more based on if a redevelopment commission is involved, if parcels are being consolidated, and whether staff has capacity.

Recommendations

- Provide dedicated resources for administration of TrOD projects. When possible, a designated primary staff member can apply consistent administration and understanding of unique TrOD regulations.
- Provide an expedited approval/permitting process or other incentives to mitigate any additional delays created by TrOD-specific processes, as well as to incentivize developers to provide additional desired amenities.
- Ensure clear roles and responsibilities with adjacent properties regarding maintenance responsibilities through written agreements and consistent management.
- Establish operations and management partnerships/ intergovernmental agreements to ensure continuous levels of maintenance between jurisdictions.
- Eliminate nightly trail closures so that trails can continue to operate as commuting opportunities for late- and early-shift workers. Permit pedestrian-scale lighting to provide security while limiting impacts to nature and nearby residents.
- Invest in smaller maintenance vehicles to minimize conflicts with pedestrians and bicyclists.

Three Rivers Heritage Trail, Pittsburgh, PA

DESIGN

Typical Barriers

- There can be issues with crowding and conflicts between pedestrians and cyclists on the trails. This tends to happen mostly in high-traffic areas with more dense development and at trail intersections. (See conflict management section.)
- There tends to be repeat instances of cars accidentally driving on trails, posing a safety issue for trail users.
- Design requirements such as parking, setbacks, and proximity to nearby existing buildings often impact new development projects. There may be a unique design review process for areas along trails. Although these requirements are standard in development, traditional requirements may conflict with the unique needs of TrOD design and unique requirements may result in more legwork for the developer. Cities can also utilize design review to allow for site-specific flexibility that can still achieve desired results while offering incentives and alternatives for compliance.
- Trails are typically seen as a recreational amenity, but they need to be connected to other daily needs such as work, food, schools, daycare, and entertainment for people to use as a source of transportation.
- Existing infrastructure such as highways, busy roads, and railroads impact both safe access and a developer's willingness to build. Although proximity and access are typically desirable for development, they should come with additional design consideration for TrOD.

Variations by Context

Urban areas often have more constrained sites, creating challenges with fitting setbacks, amenities, and trail connections within the development site. Urban areas also often allow for higher densities and building heights. Suburban areas sometimes tend to use or require larger setbacks, which can be valuable space along trails for amenities and parallel paths that reduce overcrowding but can also limit development potential.

Recommendations

- Focus on building form rather than land use through the use of by-right designations for residential, commercial, and/or mixed uses, supported by expanded design regulations that make adjacent buildings desirable for the TrOD node regardless of use, which may change over time.
- Where appropriate, utilize design review processes to allow flexibility and design-related incentives to developments that may otherwise struggle to build in TrOD areas.

Clear Creek Trail, Golden, CO

SOCIAL

Typical Barriers

- The planning process for new trails and TrOD is often impacted by social perceptions of issues such as safety, proximity to homes, density, specific land uses, etc. These concerns are often present at first, but they tend to be quelled once the trails or development projects are completed and expectations turn out to be unfounded or exaggerated. However, the impact of fear and misinformation can greatly stall a project or lead it to fail.
- Political support is crucial to the creation and implementation of successful TrOD. Without it, the creation of TrOD-friendly regulations and the approval of TrOD projects may be stalled or fail altogether.
- Sometimes current property owners are unwilling to sell or redevelop trailside property to TrOD or oppose neighboring developments that differ from the historic pattern along the trail.
- Concerns over trail overcrowding affect willingness to use the trails. In some places that see significant congestion or gathering on the trail, commuters reportedly use alternative pathways to avoid slowdowns or conflicts. (See design and conflict management sections.)

Variations by Context

Social barriers tend to apply similarly across contexts. Elected officials can vary in support for TrOD and as noted above, having their support can often be important for TrOD success.

Recommendations

- Promote the trails publicly as both a recreational amenity and a transportation option.
- Address concerns around safety, displacement, density, and value of potential or incoming TrOD by promoting the success of existing nearby TrOD using comments and testimony from adjacent residents, neighborhoods, businesses, and visitors of existing TrOD.
- Consider the use of Community Improvement Districts (CIDs), supplemented by sales tax and/or special assessments to provide surveillance or "rangers" within TrOD nodes to monitor and provide assistance to trail and node users. Creative solutions such as live-feed wildlife (bird nests, bat houses) cameras that include the trail may provide additional "eyes on the street" while simultaneously offering benefits such as educational opportunities.
- Partner with trail- or TrOD-specific nonprofit organizations for outside educational and programming support for TrOD.

PROMOTING NODAL DEVELOPMENT

During this process, it has become clear that trail-oriented development should occur in nodes along regional trails, rather than in a continuously built-out fashion. This approach supports a balance of trail experiences, creates a critical mass within activity centers, and can respond to context-sensitive safety needs.

PRESERVING NATURAL TRAIL EXPERIENCES

People often use trails to spend time outside and in nature. Even urban trails in Central Indiana have uninterrupted sections that feel immersed in nature, and these should be preserved just as much as nodal development is encouraged in other locations. Tree cover and vegetation provide multiple benefits – respite from the sun and bad weather, a boost in mood and mental health benefits, environmental and air pollution mitigation, and aesthetically pleasing experiences. Landscaping and tree cover balance the built environment, support local ecosystems, and help to provide a sense of place.

Recommendations

- Designate specific areas as TrOD nodes to help preserve natural trail sections and prevent complete infill with development. Direct development into designated TrOD nodes through regulatory tools to preserve natural areas and discourage sprawl along the trails.
- Partner with organizations that specialize in tree planting, nature conservation, and educational programming.
- Provide interpretative signage and learning opportunities about an area's history and nearby natural features.
- Lighting should still be provided for safety and comfort, but it should be pedestrian-scale and below a certain brightness threshold so as to preserve a natural experience.

FOCUSED ACTIVITY CENTERS

Nodal development should occur along trails in dense clusters to help create walkable destinations and ensure activity at all times of day and year. Activity and people in the area create a "critical mass", which ensures a place feels lively, businesses are more likely to succeed, increases safety, and contributes to community connection and sense of place. By allowing for a mix of uses along trails, the trails can be used for both recreation and transportation. When work, errands, play, and home are well connected along trails, they can truly be utilized for transportation in addition to recreation, leading to more trail utilization and people in TrOD nodes. This can lead to improved health, economy, and social connections.

Three Rivers Heritage Trail, Pittsburgh, PA

The form of development is equally important to the use. Traditional zoning codes have typically focused on land use over design, resulting in clusters of similar uses without a sense of place. Form-based zoning, which has been emerging in recent years as a preferred method of managing development, encourages a wider (though still limited) range of uses while instead focusing on aspects of design such as massing, setbacks, architectural elements, and transparency of the buildings. By focusing on form and design that is most beneficial to TrOD such as setbacks, density, and transparency, a node can truly become a place that offers a variety of reasons to be there, be it living, working, shopping, or recreating.

Recommendations

- Nodes should focus on building form and be flexible in permitted uses. Permitted uses should include use-by-right, which would allow residential, commercial, and/or mixed-uses in a TrOD node regardless of the underlying zone district.
- Direct nodal development to denser, trail-oriented design that promotes a sense of place within the node.
- Brand nodes as identifiable, individual destinations that are still consistent with the adjacent trail's existing branding. Cultural districts should be established in locations with historic value or minority populations to preserve existing identity.

CONFLICT MANAGEMENT AND SAFETY

Any time activity along trails is focused in nodes, the potential for conflicts increases. There have been many concerns and specific incidences of conflict between users that may prevent TrOD or impact its success that should be addressed. See the Design Guidelines for more specifics on managing conflicts and safety in TrOD. These conflicts typically fall into three categories: trail/street intersections, bicycle/pedestrian conflicts, and public/private space.

Trail/Street Intersections

The intersection of a trail and a street tend to be major conflict points. At these and other locations, cars sometimes drive on the trail. To address some of these issues, trail crossings should be clearly signed, grade-separated if possible, or utilize traffic calming if at-grade.

Recommendations

- Physically separate trail crossings from the road by raising the grade of the trail to improve visibility of trail users and slow vehicles. Differentiate the crossing from the road through the use of different paving materials, paint, or murals.

Boulder Creek Path, Boulder, CO

- Include traffic calming approaches before vehicles reach the crossing such as narrowing travel lanes, rumble strips, bulb-outs and medians, and signage.
- Prevent vehicles from turning onto trails using bollards, art, and planters to block vehicles, signage and branding that clearly defines the location of the trail, and clear color and material changes from road.

Bicycle/Pedestrian Conflicts

In some nodes, an overcrowding of trail users can cause issues when pedestrians crowd the trail or gather in place on it. This causes slowdowns in the flow of traffic. Additionally, the speed of cyclists is typically faster than pedestrians, which can be both a safety issue and a catalyst for confrontation. In these instances, separation of modes or inclusion of parallel paths can help mitigate conflicts.

Recommendations

- Ensure that in areas with the potential for crowds, nearby alternative cycling pathways are safe and convenient for redirected commuting traffic. This includes adequate bicycle facilities with clearly defined signage.
- Use design of amenities to direct gatherings off the trail through the use of spurs, signage, physical barriers, and designated space for lines of people waiting to get into adjacent businesses.
- Ample shade and amenities located to the side of the trail to attract individuals and smaller groups that are resting or pausing.
- Clear dividers such as low walls, landscaping, grade variation, and art to physically separate play areas and gathering spaces from trail traffic.
- Staggered trail connections and spurs to slow flow of traffic and reduce density of users in one location. Avoid four-way intersections of trails in busiest areas.

Minutemen Bikeway, Arlington, MA

Recommendations

- Provide catalogue of examples of attractive trailside developments and private spaces that use barriers (landscaping, short fencing/walls, art, and natural features) to ensure private space while still activating the trail.
- Provide clear, written agreements of maintenance responsibility boundaries and amenity guardianship at the time of project approval.

Rail Trail, Charlotte, NC

Razorback Greenway, Springdale, AR

Wonderland Creek Path, Boulder, CO

EQUITY AND AVOIDING DISPLACEMENT

POTENTIAL EQUITY IMPACTS OF TrOD

A potential concern with targeted development and improvements such as TrOD is the displacement of existing residents, particularly low-income residents and legacy small businesses that can't afford increasing housing costs or property taxes, as well as minority populations that are frequently excluded from planning and engagement efforts for their communities. Proactive measures should be taken to ensure everyone who is potentially affected by TrOD is included in visioning and anti-displacement efforts and that they can continue to live in their own revitalized community.

Naturally Occurring Affordable Housing (NOAH) is housing that is considered affordable based on the area median income, but unsubsidized. This housing is greatly at risk of gentrification as new developments occur . Locally-owned, small, legacy, and minority-owned businesses are vulnerable to displacement as well, as well-resourced corporations, chain businesses, and individuals purchase property for development or speculation, causing existing owners to face increasing rental rates, property taxes, and/or competition. Affordability in housing and gentrification of communities are two issues that require a wide and varied range of strategies to address, many of which may be applied directly within a TrOD area's boundaries, although some may require broader application.

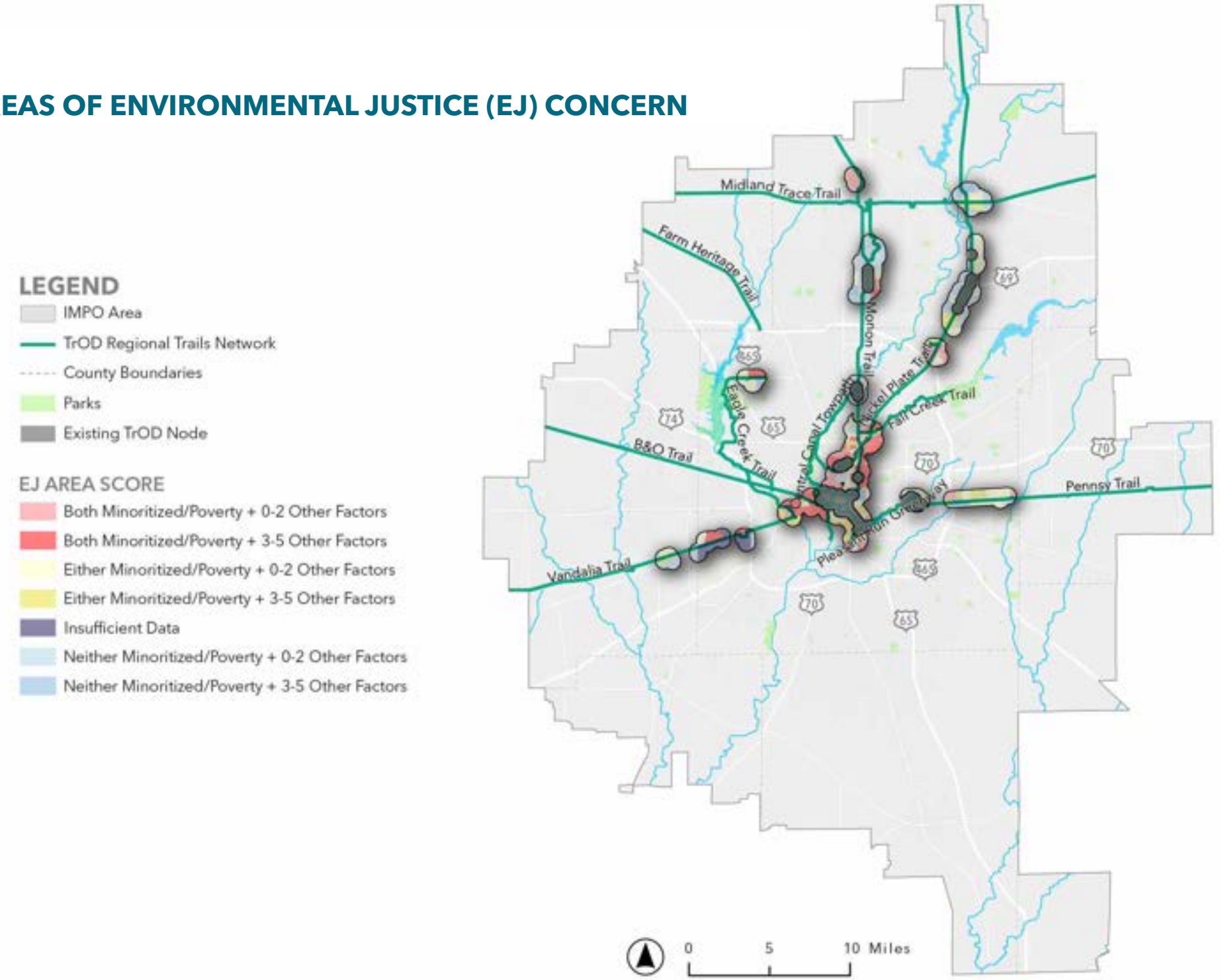
Historically, many non-white or minority populations have not always been included in community policy decisions and other systemic oppression in various forms has led to communities of color and other minority groups not always having the same access to things like generational wealth or education. In turn, this has resulted in some people within these communities having reduced opportunities to enjoy things like outdoor recreation. For this reason, many organizations have emerged to increase access to the outdoors and include communities of color in outdoor recreation. This is relevant to TrOD, because it's important that all residents of Central Indiana have equal opportunity to reap the benefits of the regional trail network and TrOD development.

Low-income communities are some of those most likely to use trails for transportation, often supplemented by transit, but don't always consider the trails as a source of recreation. TrOD should uplift and connect communities of all types and should serve as a source of transportation as well as recreation, and it should not just occur in new, expensive areas. For these reasons and more, communities should promote equitable TrOD and proactively plan for avoiding equity-related issues.

ENVIRONMENTAL JUSTICE AREAS

The IMPO's "Environmental Justice areas" (EJ areas) are the result of regional analysis "to find concentrations of disenfranchised, disadvantaged, and underrepresented populations (aka "EJ populations")." The resulting map displays areas within the metropolitan area that require focus on preventing gentrification and inequitable results as development occurs, focusing on low-income and minority populations, as well as populations with limited English proficiency, no college degree, no automobiles, people over the age of 65, and people with disabilities.

AREAS OF ENVIRONMENTAL JUSTICE (EJ) CONCERN



The map on the previous page displays the EJ status of areas closest to existing or potential TrOD nodes. More information about how these nodes were mapped is available in the "Opportunities for Central Indiana" section of this study.

Areas along trails with the highest EJ Area scores, that likely warrant further study and proactive action regarding risk of involuntary displacement, include:

Indianapolis

- Mount Jackson Neighborhood, located west of downtown Indianapolis between the Eagle Creek Trail, the Vandalia Trail, and the B&O Trail
- Areas north of downtown Indianapolis along the Fall Creek, Nickle Plate, and Monon Trails
- Parts of Bridgeport and Sterling Heights along the Vandalia Trail
- Parts of Legendary Hills along the Eagle Creek Trail
- The Castleton neighborhood along the Nickel Plate Trail in northeast Indianapolis
- Neighborhoods surrounding Garfield Park along the Pleasant Run Greenway just southeast of downtown

Carmel

- Neighborhoods southeast of downtown Carmel in Newark Village along the Monon Trail

Westfield

- Developing areas northwest of downtown Westfield along the Monon Trail at Grand Park

PROACTIVE EQUITY STRATEGIES

Communications

- Outreach and engagement related to TrOD and trails should specifically target populations that have historically been left out. This includes people who are non- or limited-English-speaking, non-white, migrant, low-income, differently-abled, religious and ethnic minorities, and younger/older people, who should be included via access to interpretation, cultural flexibility, accessibility, time and frequency of engagement, and method of engagement.
- Celebrate prominent local cultures through relevant art, signage, and programming. Establish cultural districts and programming that emphasize existing populations. See the Programming Toolkit for more detail.

Partnerships and Incentives

- Partner with organizations that focus on elevating underrepresented voices and connecting underserved communities with recreation, the outdoors, and transportation options.
- Using MWBE contractor programs as a model, encourage retention and creation of minority (ethnicity, gender, LGBTQ, disabilities, etc.) -owned businesses and -oriented organizations/programming through incentives such as tax credits and breaks, grants, focused promotion of businesses, and provision of entrepreneurial resources.
- Encourage businesses that provide a variety of skill-level jobs and growth opportunities to locate along trails as an affordable commuting option.
- Utilize proactive strategies for existing affordable housing, such as property tax freezes for longtime homeowners, seniors,

or low-income homeowners within EJ areas, partnering with mission-driven developers to provide affordable and mixed-income housing, and programs that maintain a percentage of affordable units through refinancing with low- to no-interest loans for a guaranteed length of time.

- Consider taxing alternatives, such as (See Finance Toolkit for more information):
  - » Land-value taxes that increase property taxes on the value of land while reducing the taxes on its improvements to encourage development, reduce speculation, and help retain existing homeowners and businesses.
  - » Vacancy taxes to encourage development and occupancy in underutilized areas. Undeveloped land and homes that are not occupied full-time by owners or long-term renters would pay an additional tax.
  - » Community Revitalization Enhancement District Tax Credits (CRED) to encourage investments in redeveloping or rehabilitation properties to preserve existing buildings and legacy properties at risk of loss (see Financial Toolkit).
  - » Affordable and Workforce Housing Tax Credit (AWHTC) to encourage investment in low-income housing (see Financial Toolkit).
  - » Equitable Transit Oriented Development (ETOD)/ Community Development Financial Institution (CDFI) and Gap Financing for the preservation or development of affordable housing units within half a mile of a transit stop (see Financial Toolkit).

Development

- Support the use of trails as major transportation infrastructure that provide connections to other transportation modes and trail-adjacent development including a variety of destinations, essential services, job opportunities, and homes.
- Focus community-supportive services in clusters along trails, including affordable housing, family centers, community centers, schools/higher education, etc. These services should be directly accessible to the trail, as well as nearby transit services.

CASE STUDY: BRUSH CREEK SOCIAL SERVICES

Brush Creek is a celebrated waterway in Kansas City, Missouri's midtown that passes through some of the city's most historically significant areas, including the Country Club Plaza, a century-old destination for shopping, dining, living, and working, and the city's east side, a historically redlined, low- and middle-income area that is now threatened by gentrification and the loss of its black history and culture as housing prices rise. Two miles from the Plaza, directly accessible via the Brush Creek Trail, is a concentration of services that provide support for the community, including the new Emmanuel Family & Child Development Center, the Martin Luther King, Jr. Square's adaptive park, affordable multifamily housing, the Kansas City Homesteading Authority, Job Corps career training center, and other services. Although the city is not known for its walkability, most of these services have direct connections to the picturesque trail, as well as major highway and transit connections, providing access to support a community that has long been underserved.

TOOLKIT SUMMARIES

The three toolkits completed during this effort are intended to serve as a resource and can be used by the IMPO, local jurisdictions, and developers in the implementation of TrOD. **The toolkits are summarized in this section and the complete toolkits are available in the appendix.**

OPERATIONS AND MANAGEMENT TOOLKIT

A robust operations and management plan helps to allocate resources efficiently, mitigate risks, enhance user experience, foster a sense of community engagement, and contribute to long-term sustainability of a trail and trail network. Operational plans can support long-term coordination among multiple partners including metropolitan planning organizations, local municipalities, nonprofits, and the private sector. Additionally, a transparent and shared maintenance strategy can foster a stronger, more vibrant community of trail enthusiasts.

The plan should include a comprehensive set of strategies and components. This toolkit covers best practices related to the day-to-day operations, maintenance, safety, and improvement of trail networks. The appendix includes best practices case studies from around the country.

The primary objectives of this toolkit are to:

- Compile best practices that serve as a resource and enhance the coordination and overall user experience of the Central Indiana trail system.
- Present viable models and methods for the efficient operation and maintenance of trail nodes, full trails, and potentially a broader trail system / network.

This toolkit is organized into five sections:

1. **Challenges and Opportunities** - In a review of case studies from across the nation, management entities face similar challenges. These are summarized below and the toolkit includes common challenges alongside corresponding strategies that are employed to address these challenges.
    - » Identified Opportunities: Guidance from a regional governance/planning agency; creation and maintenance of public, private, and nonprofit partnerships; institution of interlocal municipal agreements; consistent collaboration, communication, and delineation of responsibilities; and coherent and consistent brand identity and marketing and communications.
    - » Identified Challenges: Collaboration between multiple parties; O&M at scale; inconsistency with philanthropic funding; lack of involved/ interested private entities; lack of brand and communications consistency; and uneven trail maintenance across municipalities.

2. **Operations and Management Components** - Within the plan, each should be clearly under the purview of a responsible entity to avoid duplication of efforts (see the following section on cross-sector partnerships). Below are components to consider when creating an operations and management plan:
    - » Capital Asset Management
    - » Strategic and Long-Range Planning
    - » Planning, Design, and Construction
    - » Operational Funding
    - » Space and Amenities Management
    - » Programming Management
    - » Partnership Management
    - » Staff Management
    - » Safety Plans
    - » Advocacy and Communications
3. **Cross Sector Partnerships** - Once the components of a plan are built out, the next step is to identify entities that are best positioned to lead, co-lead, or provide support for each component. The case studies reveal examples of best practices in partnership management, detailed below. Four key stakeholder entities were identified as the crucial partners to collaborate in operating and managing a trail system: nonprofits, the private sector, municipalities, and a metropolitan planning organization.
4. **Measuring Success** - Trail system operation and maintenance plans can be evaluated for effectiveness through a combination of monitoring, feedback, data analysis, and periodic reviews. Measuring the success of the plan involves assessing various factors related to functionality, user satisfaction, environmental sustainability, and community engagement. By considering the below indicators, trail managers can gain a comprehensive understanding of the effectiveness of the operations and management plan. Regular assessments and data-driven evaluations allow for continuous improvement and adjustment of strategies to ensure the long-term success and sustainability of the trail system. Below are some key indicators to consider when evaluating the success of a trail system's operations and management plan:
    - » Trail Physical Conditions
    - » Perceptions of Safety
    - » Cleanliness and Beautification
    - » Environmental Sustainability and Impact
    - » User Satisfaction
    - » Level of Volunteerism
    - » Communications and Outreach
    - » Evaluation Scorecard
5. **Case Studies Appendix** - The toolkit includes six case studies that informed the recommendations related to operations and management. Each case study includes discussion of location, managing entity, jurisdictional context, size of trail system governance structure, and funding mechanisms.

PROGRAMMING TOOLKIT

Programming is a term used to describe strategic activation of a public space through events, programs, gatherings, installations, and other engaging uses that invite people in, provide something to do, and bring people together. While closely tied to the physical design of a space, effective TrOD nodes utilize programming, in addition to thoughtful design of the built environment, to contribute to sense of place and activate the public space. Programming can provide social opportunities, support existing trail users and attract new trail users, and boost businesses and economic activity. Additionally, well programmed nodes act as anchors of activity and can help to increase visibility and a sense of safety and security.

The programming toolkit is intended to support TrOD by providing guidelines related to programming and activation within trail nodes and along trails. The Toolkit will provide best practices and inspiration for programming, specific considerations based on typology and unique contexts, and implementation and management strategies for long-term success.

Pennsy Trail, Greenfield, IN

- » Build from Existing Uses, Groups, and Other Successes
- » Accessibility and Inclusivity
- » Seasonality and Timing
- » Improvisation Opportunities and Flexibility

2. **Programming Ideas** - Each idea in the toolkit includes a description, examples, a local event highlight, and considerations by TrOD type and context. These ideas are:
   - » Events
   - » Arts and Culture
   - » Health and Exercise
   - » Play
   - » Business Activations
   - » Social Gathering
   - » Nature-Oriented

3. **Implementation** - The toolkit includes a checklist to help operators effectively implement programming ideas and plans along the Central Indiana regional trail system. Whether it's organizing events, setting up recreational activities, or creating community spaces, the checklist offers a set of actions to turn concepts into tangible experiences along trails. It's a practical tool for translating vision into vibrant, engaging spaces that enhance community quality of life.

   A Programming Implementation Plan typically includes several key elements to guide the successful execution of programming ideas along trails. By considering these ten elements, stakeholders can better ensure that programming efforts are well-organized, engaging, and responsive to community needs and preferences. These elements include:

   - Activity Calendar
   - Resource Allocation
   - Community Engagement Strategy
   - Partnership Framework
   - Promotion and Marketing Strategy
   - Evaluation Metrics
   - Flexibility and Adaptability
   - Safety Protocols
   - Accessibility Considerations
   - Environmental Impact Assessment

Rail Trail, Charlotte, NC

4. **Matching Location and Program** - A location well-suited to the specific type of programming is crucial for the success and impact of trail-oriented development initiatives. Matching a location to the specific type of programming along a trail involves careful consideration of various factors. Benefits, strategies, and resources to achieve this alignment are detailed within the toolkit.

5. **Measuring Success** - Measuring the success of a program along a trail provides valuable insights, informs decision-making, and contributes to the overall effectiveness of programming activities. The toolkit includes an example "scorecard," also found in the Operations and Management Toolkit, that organizers can use to refine their strategies, respond to community needs, and continually enhance the overall impact of programming along trails.

FINANCE TOOLKIT

Real estate development and investment along trails brings benefits for communities and trail operators. These include:

- Opportunities for affordable housing development
- Alternative transportation opportunities for existing and new users
- Value enhancement through activation and placemaking
- Legacy and new businesses support
- Increased overall economic activity and tax benefits
- Social and health-related benefits for residents and visitors

Successful developments along trails can also provide resources for ongoing operations and maintenance, plus contribute to the success and sustainability of programming and other initiatives.

In the early development of a trail or trail network, additional financial support is generally required to stimulate private investment, which can then in turn help bring the benefits outlined above. Public and private partnerships are often necessary to support the planning, development, and maintenance of trail-oriented projects, ensuring that trails become enduring assets that benefit communities and the environment.

This toolkit presents potential resources that can be leveraged to bridge gaps and to help tailor development approaches to the specific characteristics of trail nodes. The delineation of development financing components, challenges, and tools in the subsequent sections is grounded in an analysis of five case studies across the country and in Central Indiana. Each identified tool is strategically aligned with a Trail-Oriented Development type. The primary objectives of this toolkit are to:

- Understand how developments are incentivized and financed along greenways, trails, and open spaces around the country
- Inform a best practices guide for nodes and trail systems to incentivize Trail Oriented Development

Current Landscape

In conversations with local Central Indiana based developers, certain key challenges to development were identified:

- While interest in developing along trails has increased considerably, some zoning regulations and development standards aren't meeting current needs, including in the development of more dense and trail-facing projects
- The cost of land in Central Indiana increased significantly in 2020 and, though it has stabilized, land cost continues to be among the biggest challenges to development
- Additional public economic incentives are needed, such as TIFs, tax abatements, land acquisition, and other measures, to encourage development and offset costs
- Not all trails are created and maintained equally

The Finance Toolkit is organized into the following sections:

1. **Introduction** - (summarized above)
2. **Financing Components** - A review of the case studies illuminated several key components for financing developments including public economic incentivization, land acquisition, development costs, and zoning compliance. Identified challenges include zoning regulations and

development standards, prohibitive land costs, lack of public economic incentives, end user's needs, lack of affordable housing/ commercial spaces incentives, economic fluctuations, and stakeholder, property owner, and political buy-in. In review of case studies from across the country, similar challenges presented themselves. The following sections provide tools that address common challenges that arise when attempting to stimulate development and navigate the intricacies of financing components.

3. **Development Financing Tools** - This section includes a detailed overview of 13 different tools, each including a description of what it is, how it works, what it funds, scale of funding provided, requirements and restrictions, Indiana Code references, and TrOD types and context considerations. These tools include:
    - » Tax Increment Financing (TIF)
    - » Economic Development Project Districts
    - » Economic Development Tax Area
    - » Innovation Development District
    - » Impact Fee
    - » Economic Improvement District
    - » Economic Enhancement District
    - » Community Revitalization Enhancement District Tax Credit (CRED)
    - » Redevelopment Tax Credit (RTC)
    - » Tax Abatement
    - » Affordable and Workforce Housing Tax Credit (AWHTC)
    - » Overlay Zoning Districts
    - » Equitable Transit Oriented Development (ETOD)/ Community Development Financial Institution (CDFI) + Gap Financing
4. **Measuring Success** - This section includes potential indicators that can be monitored for future decision making and to understand the scale of impact.
5. **Appendix** - Four detailed case studies are in the appendix including:
    - » Equitable Transit-Oriented Development - Indianapolis
    - » Community Reinvestment Area - Cincinnati, Ohio
    - » BeltLine Overlay District, TAD, and SSD - Atlanta, Georgia
    - » Overlay District, TIF, and Tax Abatement - Greenfield, Indiana

Capital Cascades Trail, Talahassee, TN


MPO