Wye Infrastructure Plan

October 2025

CONTENTS

CONTENTS

FIGURES

FIGURES

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Acknowledgements

Missoula County acknowledges that this event takes place in the aboriginal territories of the Salish and Kalispell people.

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Executive Summary

The Wye Infrastructure Plan (WIP) provides a long-term roadmap for transforming the Wye area into a sustainable and vibrant urban center in Missoula County, Montana. Located at the critical intersection of Interstate 90 and Highway 93, the Wye area's strategic position makes it a prime candidate for economic and residential growth. The plan addresses existing infrastructure deficiencies and outlines the necessary improvements to accommodate the projected development over the next 50 years. By leveraging lessons learned from previous planning efforts and aligning with Missoula County's Growth Policy and the Missoula Economic Partnership's Comprehensive Economic Development Strategy (CEDS), the WIP ensures that the Wye becomes a cornerstone of the county's long-term growth.

Vision for the Wye

With over 1,200 acres of planned residential neighborhoods and 1,150 acres of industrial land, the area holds significant potential for accommodating a growing population and new businesses. The WIP envisions the development of 10,000–15,000 new homes, supported by 7.7 million square feet of industrial space that could generate approximately 11,500 jobs. By promoting high-density residential development and sustainable industrial growth, the WIP aims to reduce sprawl, foster a vibrant economy, and improve the quality of life for residents.

The Wye is currently a mix of industrial, residential, and underdeveloped lands, but by creating opportunities for development in a place where infrastructure is either in place or where there's a plan to provide it, the County has an opportunity to reduce the amount of new development in areas where it:

- consumes valuable open space and agricultural lands
- is more expensive for the County and school districts to provide services
- creates greater travel demand and therefore higher vehicle emissions; and
- is at higher risk of flooding and wildfire

The phased development approach outlined in the WIP will ensure that infrastructure improvements keep pace with growth, facilitating the creation of a dynamic urban center that attracts businesses, residents, and visitors alike. The WIP is one component of a larger strategy to reduce urban sprawl in the County, which includes tools such as zoning.

Opportunity

The WIP offers a critical opportunity to develop the Wye area into a vibrant, sustainable urban center. By aligning development with the Missoula County Growth Policy, the plan advocates for dense, intensive development that can generate sufficient tax revenue to fund both capital improvements and ongoing maintenance without relying on external subsidies. This contrasts with low-density suburban-style

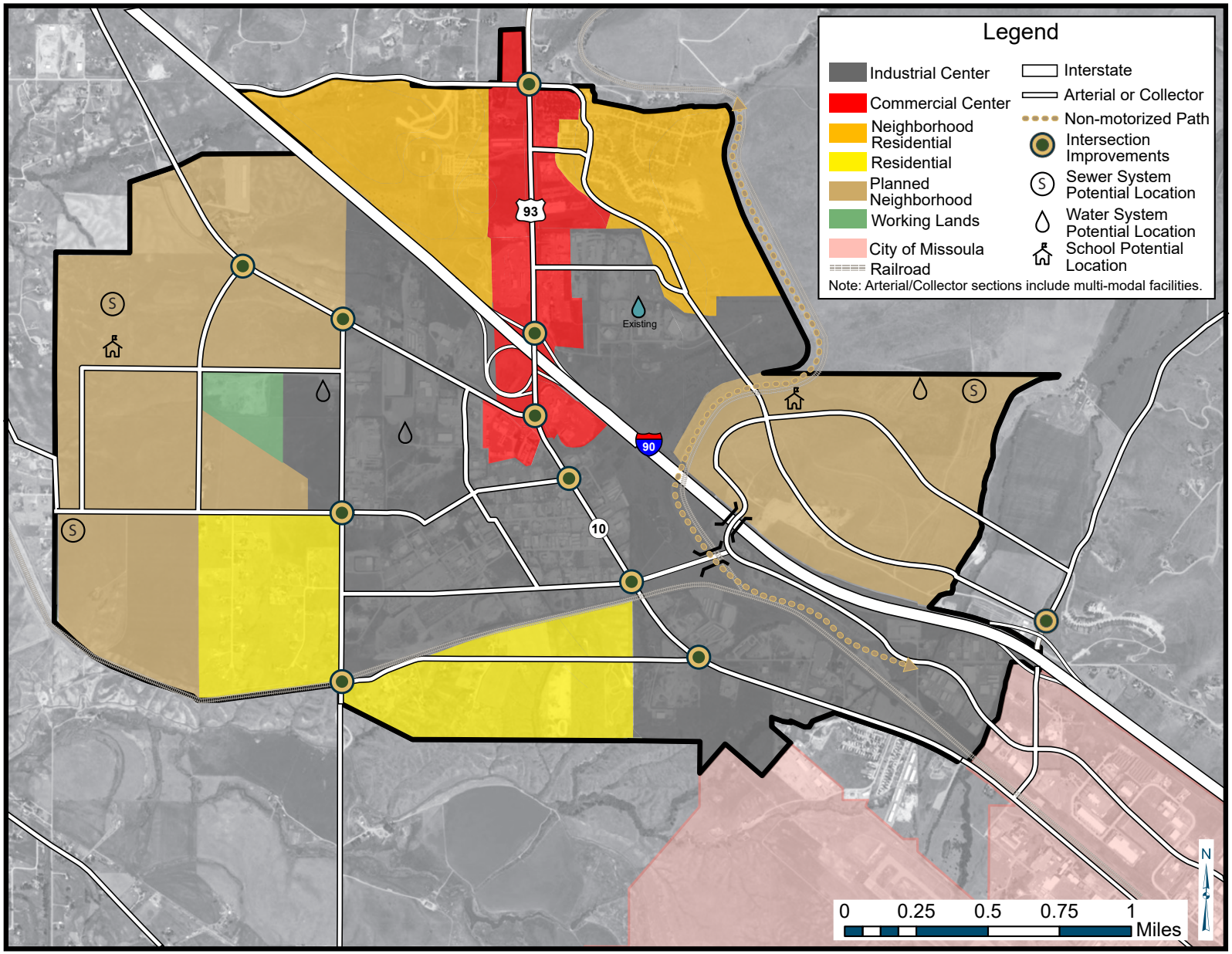


Figure 1. Overall Implementation Plan

Executive Summary

development, which often fails to generate enough tax revenue to cover infrastructure costs and requires broader community support.

The Wye's potential to contribute significantly to Missoula County's growth lies in its strategic location and the current infrastructure investment plans. Approximately 3,500 homes and 1.5 million square feet of industrial projects are already planned for the next 20 years. If these projects are implemented successfully and infrastructure improvements continue, development figures are likely to increase.

The Wye is expected to urbanize over the next 50 years. While this timeframe may seem ambitious, historical growth rates in Missoula and current development trends suggest it is achievable. The vision includes maximizing the value of each acre through strategic public and private investments, focusing on creating dense, mixed-use developments that foster economic growth.

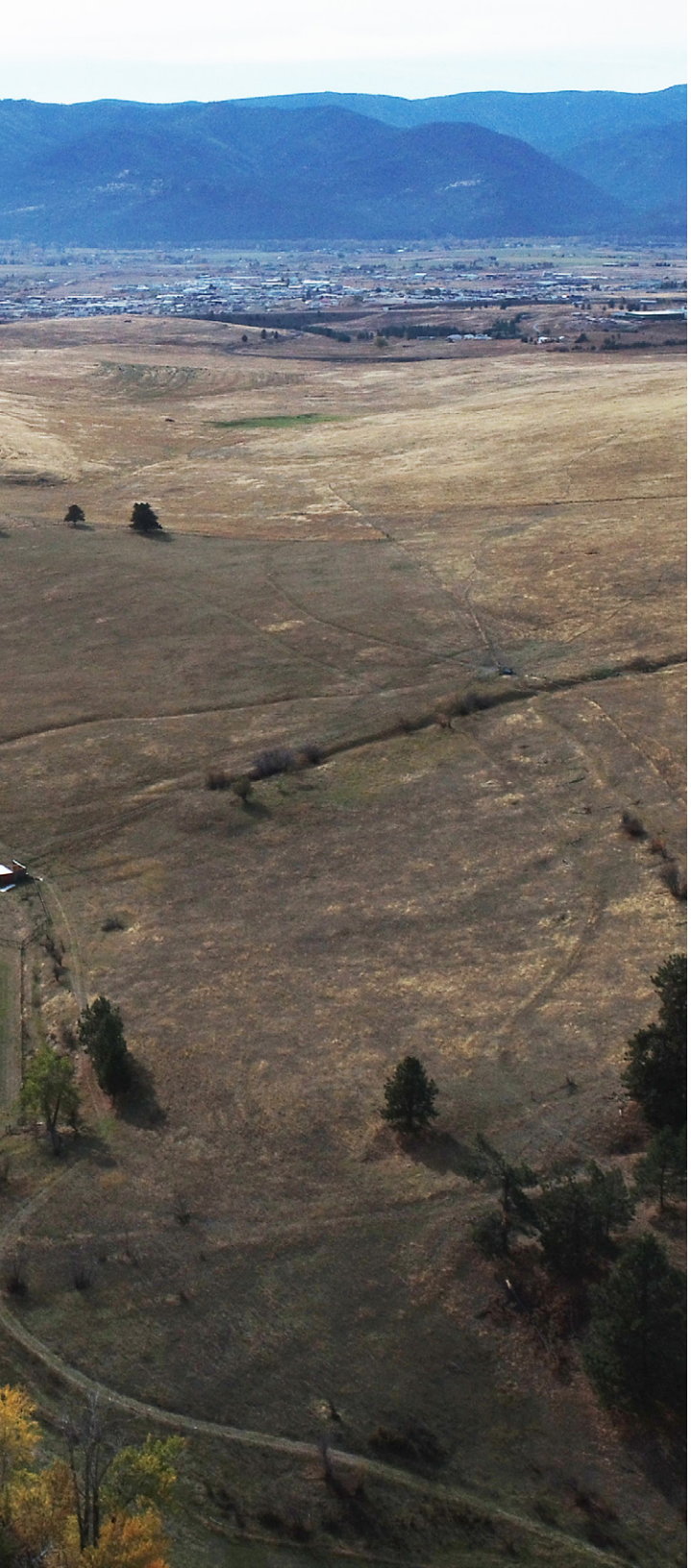
The WIP emphasizes collaboration between the public sector and private developers through public-private partnerships (PPPs), making use of tools such as Tax Increment Financing (TIF) and Targeted Economic Development Districts (TEDDs). These mechanisms are essential for accelerating development by funding necessary infrastructure projects. By leveraging TIF and TEDD structures, Missoula County can ensure that critical infrastructure is in place, thereby facilitating new developments and enhancing the overall taxable value per acre.

Infrastructure Needs and Challenges

Transportation and Circulation

The Wye area benefits from excellent regional connectivity via Interstate 90, Highway 93, and Highway 10. However, internal circulation and non-motorized transportation remain significant challenges. The major highways create physical barriers for pedestrians and cyclists, and many of the internal roads remain unpaved, making non-motorized travel difficult and unsafe.

To address these issues, the WIP proposes the development of a multimodal transportation network that includes improvements to existing roads, the construction of additional crossings over the interstate, and the addition of bike lanes, sidewalks, and pedestrian pathways. The WIP also emphasizes the need to extend public transit services, particularly Mountain Line, to better serve the growing population. With the projected growth in residential and industrial areas, traffic volumes are expected to increase significantly, which will require proactive planning to ensure that congestion and accessibility issues are mitigated.



Executive Summary

Water Supply and Distribution

Water supply is one of the most pressing infrastructure challenges in the Wye area. Currently, many parcels lack access to public water systems, and existing water infrastructure is insufficient to support the projected growth. The WIP projects that water demand will reach 8.64 million gallons per day (MGD) by the 50-year mark, driven primarily by residential and industrial development.

Wastewater Management

The WIP outlines the need for new sewer treatment facilities, lift stations, sewer main extensions, and potential sewer treatment facility upgrades to accommodate projected wastewater flows, which are expected to reach 5.58 MGD by the 50-year mark.

Stormwater Management

The Wye area currently lacks adequate stormwater management infrastructure, which poses significant risks as development increases. The region's clay soils, which are not conducive to infiltration, exacerbate drainage issues. Without sufficient stormwater infrastructure, the risk of flooding and water quality degradation increases. The WIP includes a comprehensive stormwater management strategy that focuses on the construction of new drainage basins, stormwater conveyance systems, and other improvements to manage runoff from roads, industrial areas, and residential developments.

Schools, Parks, and Emergency Services

As the population grows, so too will the demand for schools, parks, and other public services (fire, police, and first responders). The WIP includes siting criteria for the development of new schools and parks to serve the projected 10,000–15,000 new households. These amenities are critical for ensuring a high quality of life for residents and for creating a sense of community in the Wye area. Attention is also given to emergency services.

Implementation Strategy

The Wye Infrastructure Plan is structured around a phased approach to infrastructure development, ensuring that key foundational elements are in place to support long-term growth. The strategy focuses on deploying a combination of local funding sources and public-private partnerships (PPPs) to meet immediate and future infrastructure needs, while maximizing the potential for sustainable development.

At the time of the WIP's publication, Missoula County has taken significant steps towards addressing infrastructure deficiencies at the Wye. Notably, in Sub Area B (see Figure 2), a public water system capable of providing fire flow to support industrial development is under construction, made possible through the County's strategic commitment of TIF resources. Missoula County's

Executive Summary

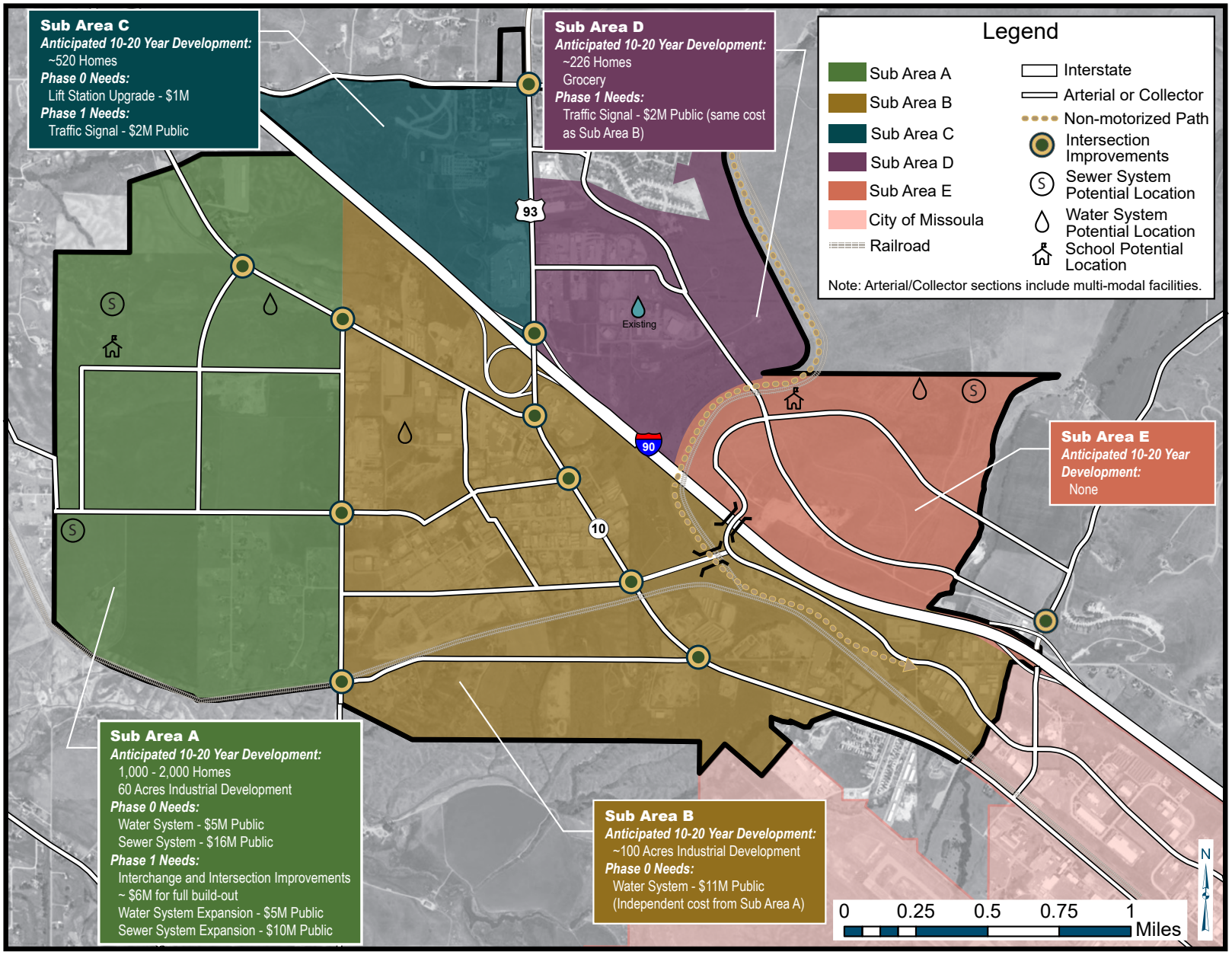


Figure 2. WIP Development Sub Areas *Note: The projections listed in this graphic represent anticipated 10-20 year growth only.*

Executive Summary

proactive leadership has facilitated industrial development, including the construction of a new base of operations for Montana Knife Company, which will accommodate up to 200 employees.

Several other industrial and residential projects are currently underway across various Sub Areas, which will contribute additional tax increment, supporting the implementation of the WIP and advancing long-term success for both the County and the Wye.

Phase 0: Catalyst and Precedent Infrastructure

Phase 0 is critical to initiating meaningful development in the Wye area. It focuses on installing the foundational infrastructure required to support the projected growth, including essential sewer, water, stormwater, and transportation improvements. Preliminary total project cost estimates for this phase are approximately $42 million (note: all costs in the WIP reference 2025 dollars). Key projects include:

- **Sewer System Improvements:** Installation of primary and mechanical treatment systems and disposal for the planned residential neighborhood west of Deschamps Lane (Sub Area A), with additional improvements to the City of Missoula's lift stations (Sub Area C).
- **Water System Expansion:** Investments include industrial water systems for supply, storage, pumping, and transmission, along with residential water systems to meet future demand. These improvements will support initial residential and industrial developments.
- **Transportation Enhancements:** Key intersection improvements, such as upgrades to the I-90 westbound ramps and a new traffic signal at Highway 93 and Waldo Road, are vital for improving access to and from the Wye area.
- **Stormwater Management:** Addressing drainage limitations through outfalls, collection systems, and detention facilities is essential to prevent flooding and ensure sustainable stormwater management as the area urbanizes.

Conclusion

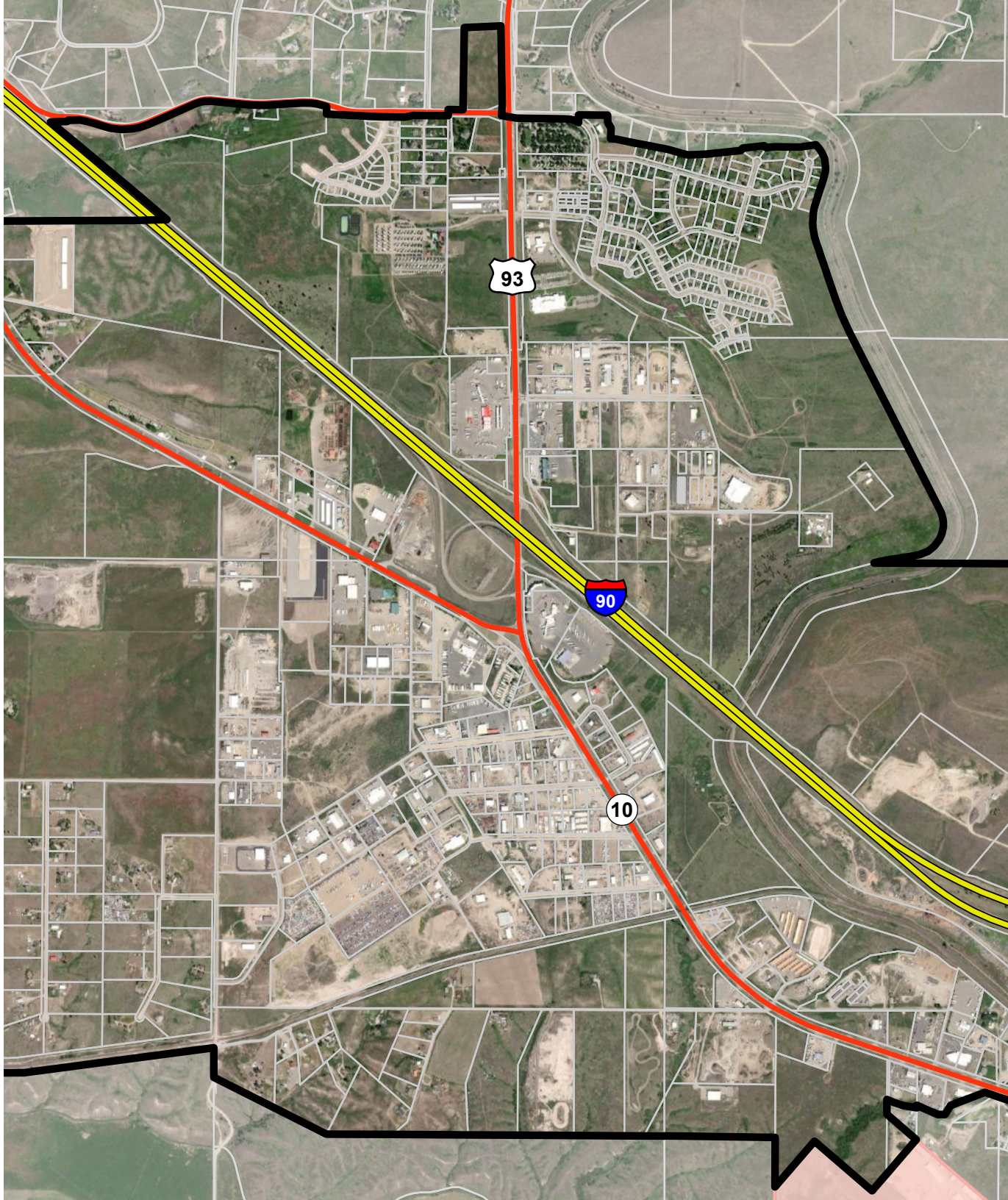
The WIP offers a comprehensive and forward-looking strategy for transforming the Wye area into a thriving urban and industrial center. By addressing critical infrastructure needs, fostering sustainable growth, and leveraging strategic funding mechanisms, the plan sets the stage for a prosperous future. Over the next 50 years, the Wye is poised to become a key driver of Missoula County's economic development, supporting a growing population and providing high-quality public services and amenities.

The successful implementation of the WIP will require ongoing collaboration between Missoula County, the City of Missoula, private developers, and community stakeholders. By adhering to the principles outlined in the WIP, the Wye area can achieve its full potential as a model for sustainable urbanization and economic vitality.

The Wye

The Wye Area, located at the intersection of Interstate 90 and Highway 93, sits near the center of the Valley just west of the City of Missoula. The Wye is a census-designated place in Missoula County, Montana and is part of the Missoula metropolitan area. The community is named for the “y”-shaped DeSmet Junction where US 93 and MT 200 meet former US 10 (immediately south of US 10’s replacement, I-90). The population was 714 at the 2020 census, up from 511 in 2010.

Both Missoula County’s planners and residents have identified the Wye as essential for future growth, envisioning a vibrant urban landscape featuring diverse neighborhoods and a robust industrial center. With its advantageous location, major transportation routes, and ample undeveloped land, the Wye is poised for significant transformation in alignment with the community’s aspirations. However, one notable challenge remains: inconsistent infrastructure. Although the existing transportation corridors, sufficient power and gas supply, and some sewer and water services provide a solid foundation, a comprehensive street network, enhanced sewer and water infrastructure, and effective stormwater management are crucial for realizing the Wye’s full potential. This Wye Infrastructure Plan (WIP) delineates a strategic approach for designing and implementing these key infrastructure components, while also addressing broadband access and criteria for school and park locations. By adhering to this roadmap, a prosperous future for the Wye Area can be achieved.



The Wye

History

The Wye's development is best understood through its transportation infrastructure. The junction of Highway 93 (north-south) and Highway 10 (east-west) established the area as a crossroads of regional travel and commerce. This location—further strengthened by its proximity to the Burlington Northern and Milwaukee Road rail lines—was the foundation for the Wye's role as a hub of trade and industry. The construction of Interstate 90 and its interchange at the Wye in the late 1950s and early 1960s fundamentally transformed the area. Major road junctions have long been catalysts for commerce, and the interstate highway system in particular reshaped patterns of urban development across the country. At the Wye, this state and federal investment in road infrastructure created rapid opportunities for industry and transport, long before local land use regulations or capital facilities planning were in place. Once built, the highway network set the trajectory of growth—subsequent county and city planning has largely been an effort to manage the consequences of those early decisions.

Natural resources also supported the Wye's growth. Timber and abundant water from the Blackfoot, Bitterroot, and Clark Fork Rivers fueled a thriving wood products sector. The Milltown Dam provided hydroelectric power, which, combined with the area's transport advantages, drew major employers such as Bonner Mill, Thornton Lumber Company, Van Evans, Roseburg, and the Hoerner-Waldorf paper mill in Frenchtown. The Wye became a key transfer point for raw materials and finished products moving by truck and rail. Support

The Wye

industries soon followed with trucking companies like Missoula Cartage, truck stops like Muralt's, equipment repair shops such as Hagan Welding, and electrical suppliers—all of which required land for operations.

In the early years, development was inexpensive but unplanned. Businesses purchased large parcels, often using only small portions, and the absence of paved roads, sewer, or water systems contributed to a disorganized pattern. The paper mill's vapor plume and odors further discouraged residential growth. By the mid-1970s, however, land use planning and zoning were introduced in Missoula County, sewer service was extended on both sides of the interstate, and a water system was developed for the Williams property. These investments enabled more orderly development. The eventual closure of the Frenchtown mill removed some support facilities, but also created redevelopment opportunities.

The Wye offers valuable lessons in land utilization. Developing land in large lots without infrastructure makes it challenging to redevelop those parcels efficiently, as it hampers the installation and maintenance of infrastructure. This sprawling development also complicates extending streets, sewer, and water services beyond its edges due to a lack of appropriate utility rights-of-way and corridors. Effective land use and capital facilities planning can enhance property values by allowing for the redevelopment of large parcels into more appropriately sized ones for their intended uses and facilitating the efficient installation and maintenance of infrastructure. Proper planning ultimately increases property and taxable values.

Figure 3. Aerial View of the Wye Area

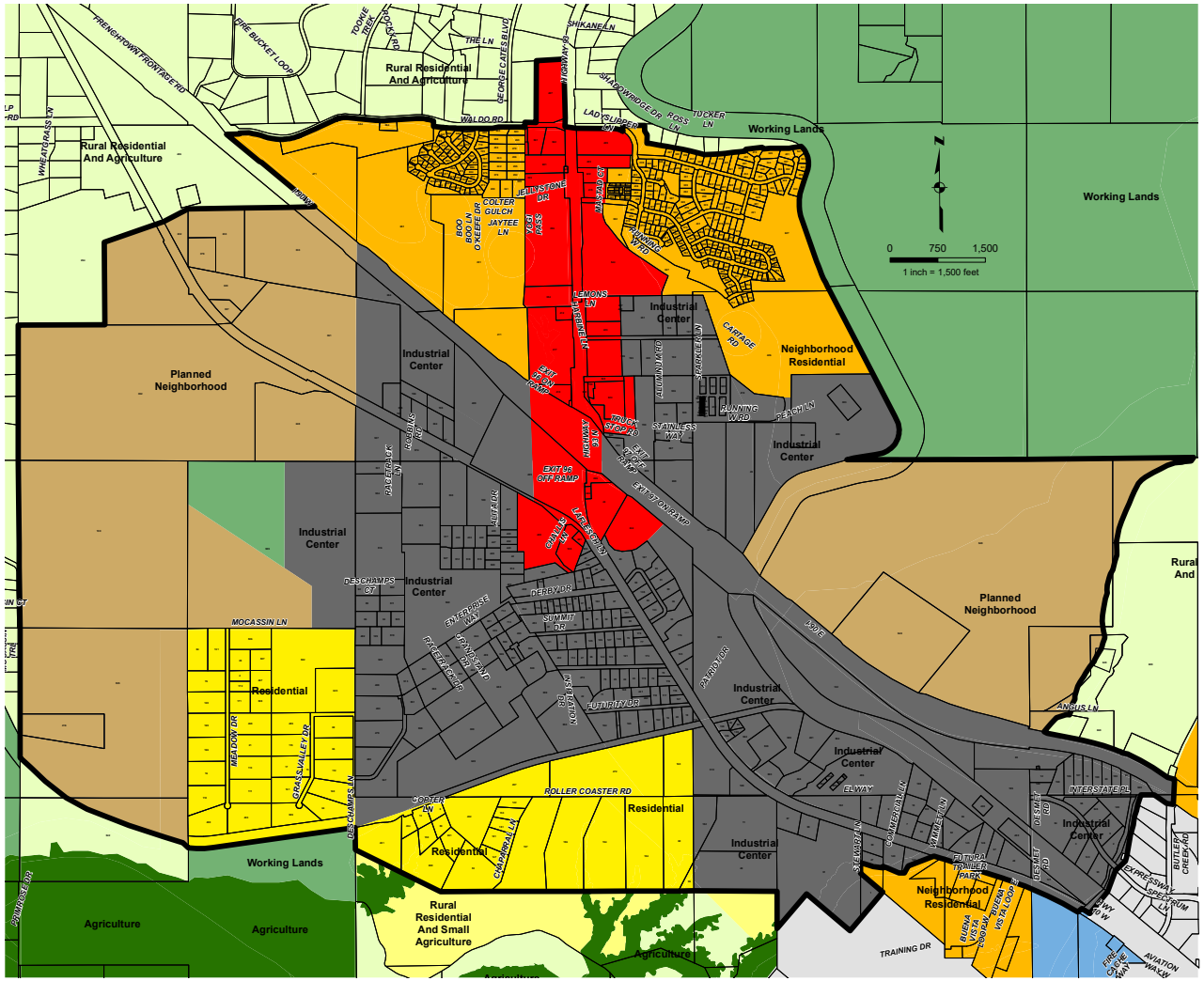


Figure 4. Plan Area Land Use

Source: 2019 Missoula Area Land Use Map

- WIP Boundary
- Agriculture
- Working Lands
- Rural Residential and Agriculture
- Rural Residential and Small Agriculture
- Residential
- Neighborhood Residential
- Planned Neighborhood
- Commercial Center
- Civic Employment Center
- Industrial Center
- City of Missoula

Current Status

Missoula County is in a fortunate position, as much of the Wye area remains undeveloped. The County's proactive planning efforts have enabled it to apply valuable lessons in land utilization effectively. Presently, the Wye stands as an important economic center.

The Wye is identified for growth in Missoula County's Growth Policy and is also established as a critical place for development in the Missoula Economic Partnership's 2021 Comprehensive Economic Development Strategy (CEDS), as adopted by the U.S. Economic Development Administration (EDA). Of the 3,400 acres of parcel area within the study area (excluding rights-of-way) there are over 1,200 acres of undeveloped Planned Neighborhood and Neighborhood Residential areas; both of these land use designations call for minimum residential densities of eight units per acre with a likelihood that some development patterns in these areas could result in average densities of 12 units per acre. Development at these densities creates opportunities for 10,000 to 15,000 new homes.

Industrial parcel area within the study area totals approximately 1,150 acres, of which roughly 540 acres are undeveloped, and 250 acres are underdeveloped and likely to redevelop as infrastructure becomes available. Current industrial market trends suggest probable parcel development ratios where 30% of a parcel's area is comprised of building footprint and the remaining 70% of the lot is developed in parking, landscaping, and utility areas. Assuming that 25% of the 790 acres of undeveloped and underdeveloped industrial lands are set aside as rights-of-way or are

The Wye

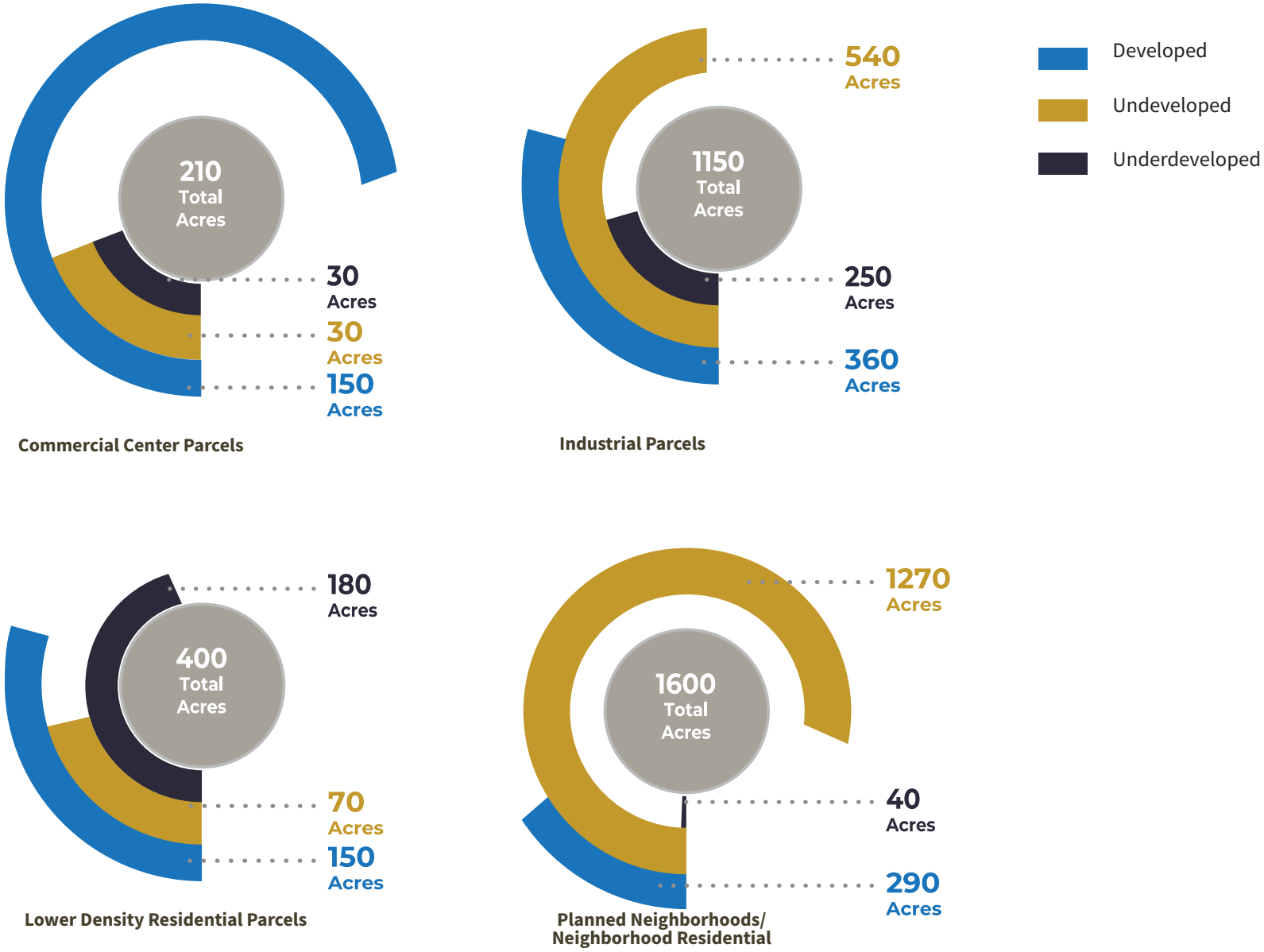


Figure 5. Parcel Summaries Within the WIP area (rounded to the Nearest 10 Acres)

otherwise undevelopable because of steep slopes, riparian areas, or other impediments, a total of 590 acres remain as developable. Applying a 30% building to lot development ratio results in the potential for 175 acres of new building footprint within the development area, or 7.7 million square feet of new industrial buildings. Market trends suggest an average of 1.5 industrial employees per 1,000 square feet of building area, suggesting these 7.7 million square feet of industrial building would support as many as 11,500 jobs.

Development Status

All parcels within the WIP study area have been assessed by development status. Designations of Developed, Undeveloped, or Underdeveloped have been applied to each parcel as depicted in Figure 5.

Developed parcels are generally built out to the density or intensity that would be expected for the given land use designation (for example: a single-family home exists on a single-family lot, or an existing industrial building covering 10% or more of an industrial parcel's area). Undeveloped parcels are generally not built upon or have very minor improvements compared to the density envisioned by the land use designation (for example: vacant land, or a 160-acre planned neighborhood parcel with a lone existing single-family home). Underdeveloped parcels are those that fall somewhere between developed and undeveloped lands and are likely to re-develop upon provision of adequate infrastructure (an industrial parcel with minor outbuildings or a small building that occupies less than 10% of the parcel area for instance).

Parcel Summaries within the WIP area (rounded to the nearest 10 acres):

- Industrial Parcels – Total Area: 1,150 acres; 360 developed acres, 540 undeveloped acres, and 250 underdeveloped acres.
- Planned Neighborhood/Neighborhood Residential Parcels (designated for 8 units/acre or greater) – Total Area: 1,600 acres; 290 developed acres, 1,270 undeveloped acres, and 40 underdeveloped acres.
- Lower Density Residential Parcels – Total Area: 400 acres; 150 developed acres, 70 undeveloped acres, and 180 underdeveloped acres.
- Commercial Center Parcels – Total Area: 210 acres; 150 developed acres, 30 undeveloped acres, and 30 underdeveloped acres.

The Wye

Legend

- WIP Boundary
- Developed
- Underdeveloped (future re-development potential)
- Undeveloped
- 123 Parcel Number

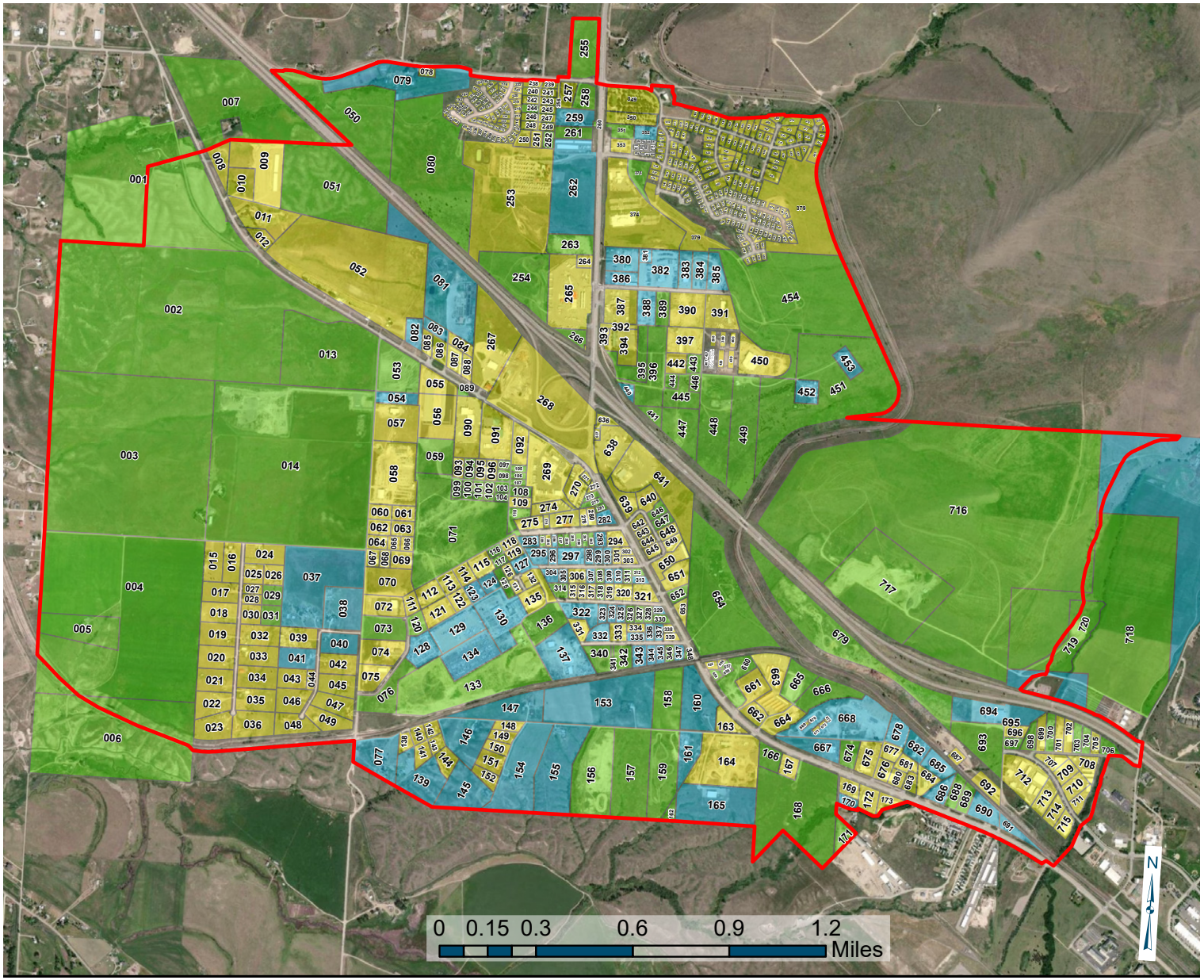


Figure 6. Parcel Development Status

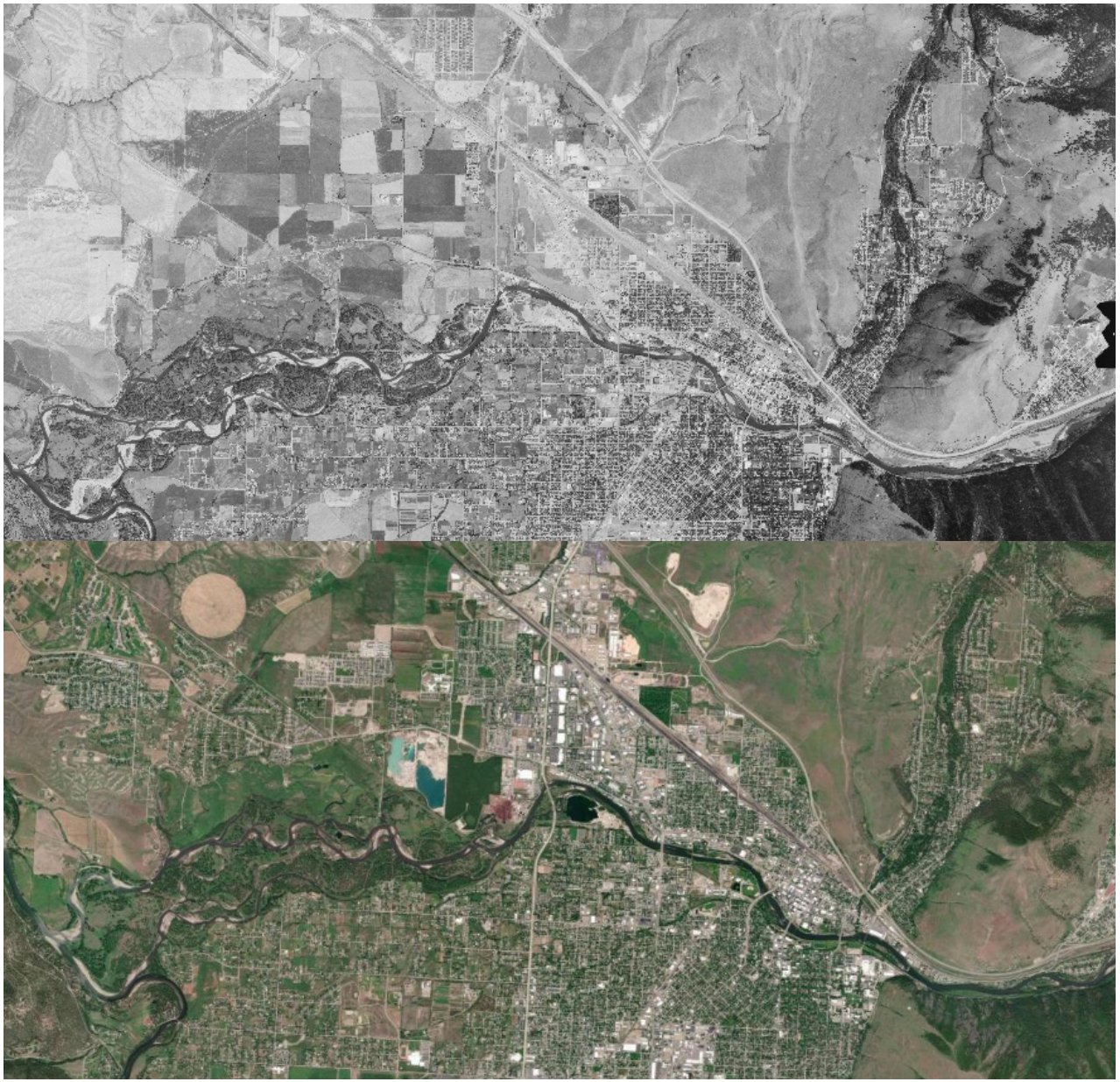


Figure 7. Missoula Valley in 1972 (top) and in 2023 (bottom)

Through Missoula County's proactive leadership, the Wye is primed for urbanization with updated zoning, strategic land use planning, and infrastructure funding by way of two Targeted Economic Development District (TEDD) initiatives: Wye TEDD 1 and Wye TEDD 2.

Missoula County's work to adopt the Growth Policy, Land Use Element, and Zoning regulations involved multiple rounds of public input and was strongly supported by the community. The vision created by these policy and regulatory documents and the Wye Area TEDDs recognizes that there is a distinct and growing community at the Wye. Over the last 50 years, this community has developed from spotted industrial and commercial uses to 100+ lot residential subdivisions and a growing community. With the inevitable growth in this area, the County is planning for the future and learning from the past.

As we look to the next 50 years, the Missoula valley is poised for predictable growth. The City of Missoula recently developed a population and housing forecast that includes both the City and the County. According to this forecast, Missoula County's population is expected to grow by 48,731 people by 2045. Of that total, 37,377 people are projected to live within the City of Missoula, leaving 11,354 people—or roughly 4,500 households—to be accommodated in the unincorporated areas of the County. This projection underscores the need for proactive planning in places such as the Wye, where development pressure is already evident, and provides a clear picture of the scale of growth the county should be preparing for in the coming decades.

Opportunity

This predictable population expansion underscores the need for a well-planned urban center at the Wye that includes services and amenities to reduce the need to travel outside of the study area, limiting Vehicle Miles Traveled (VMT) and enhancing the overall quality of life for the Wye's residents. The vision for the Wye is to become a dynamic job and economic center, playing a pivotal role in accommodating this growth.

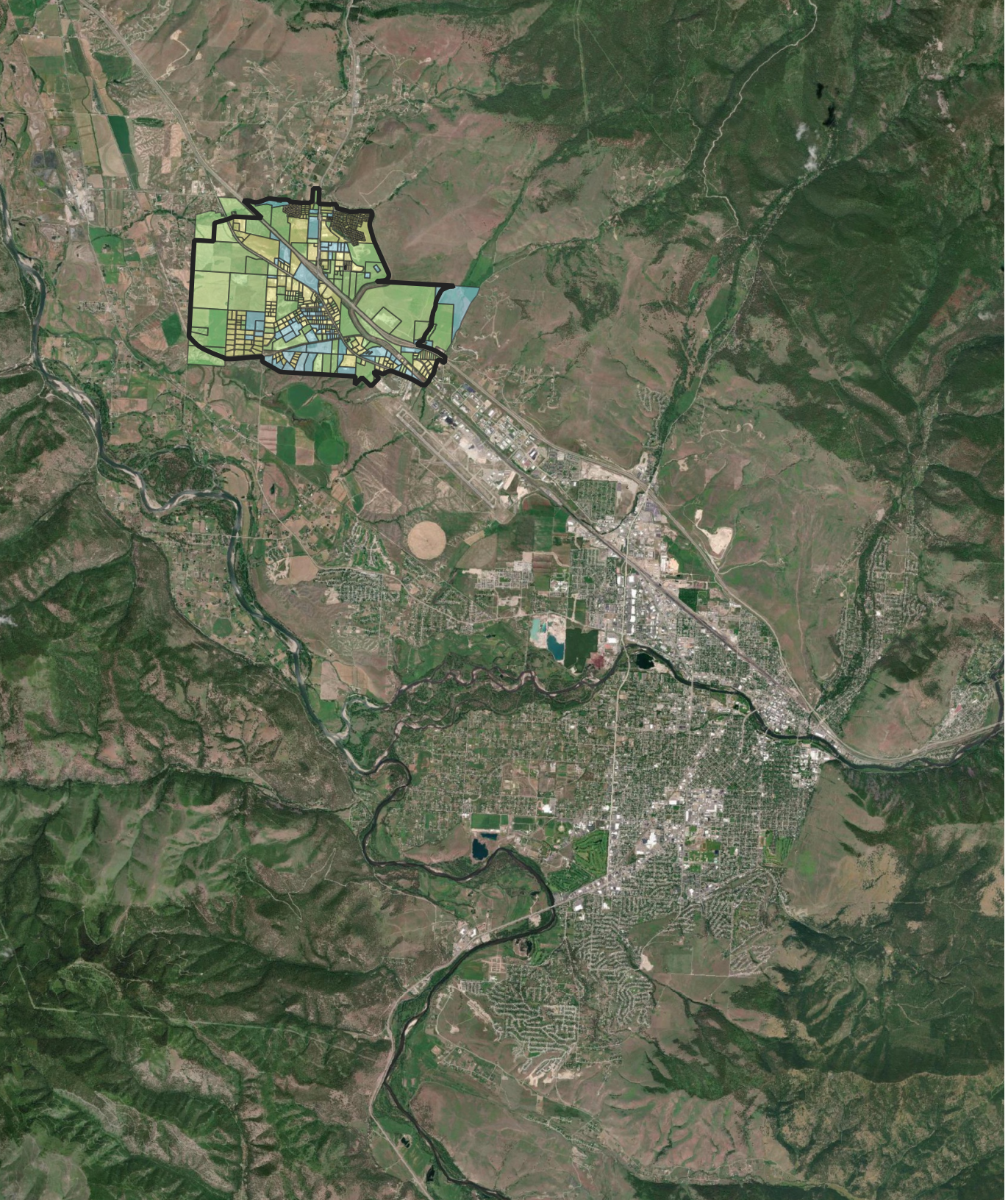
Future Urban Development

The Wye Infrastructure Plan (WIP) aims to guide the development of diverse neighborhoods through implementation of essential infrastructure, creating a vibrant and sustainable community with the potential to become a new urban center. Thoughtful planning will foster connectivity and a strong public realm that prioritizes unique experiences and modern amenities while avoiding sprawl.

Essential infrastructure components include:

- **Transportation:** An integrated transportation network to support multimodal mobility.
- **Utilities:** Comprehensive sewer and water systems, stormwater management infrastructure, broadband connectivity, power supply, and natural gas.
- **Community Amenities:** Schools, parks, and other public amenities to support a thriving community.
- **Public Safety:** Fire, law enforcement, and emergency services to ensure community safety.

Figure 8. The Wye in 1972 (top) and in 2023 (bottom)



Opportunity

For successful infrastructure development, maintenance, and expansion, it is essential that the Wye area grows in alignment with the vision outlined in the Growth Policy. The concept of taxable value per acre, advocated by Strong Towns and similar organizations, suggests that dense and intensive development can generate sufficient tax revenue to cover both capital and maintenance costs for its infrastructure and services, without needing external subsidies. In contrast, low-density, suburban-style development often fails to produce adequate tax revenue and typically requires support from the broader community. By focusing on dense development, the Wye has the potential to become a driving force for Missoula County's growth.

The WIP is intended to provide a detailed, locally focused assessment of transportation and land use needs within the Wye growth area. While the plan recognizes the regional policy framework established in the Metropolitan Planning Organization's Long-Range Transportation Plan (LRTP), it is not bound by the LRTP's current project list or fiscal constraints. Instead, this plan serves as a building block for future regional planning efforts by identifying community-driven priorities, technical analyses, and infrastructure strategies specific to the Wye. In this way, the plan both reflects regional goals and informs the next LRTP update cycle, ensuring that local priorities are carried forward into the broader regional vision.

Opportunity

The WIP envisions a 50-year timeline for the urbanization of the Wye area. This timeline was projected based on Missoula's growth from 1975 to the present and a review of current and planned development projects. Currently, there are approximately 3,500 homes and 1.5 million square feet of residential and industrial projects planned for the next 20 years. As infrastructure improvements are implemented successfully, these figures are likely to increase.

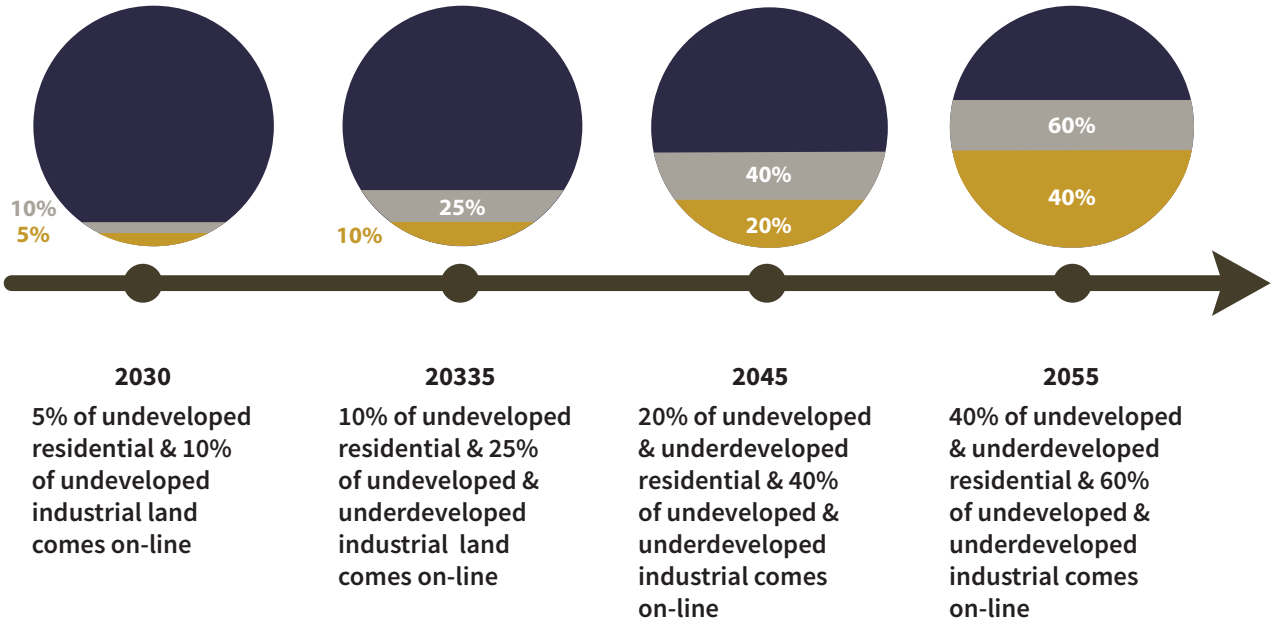


Figure 9. Development Timeline

Residential

Industrial

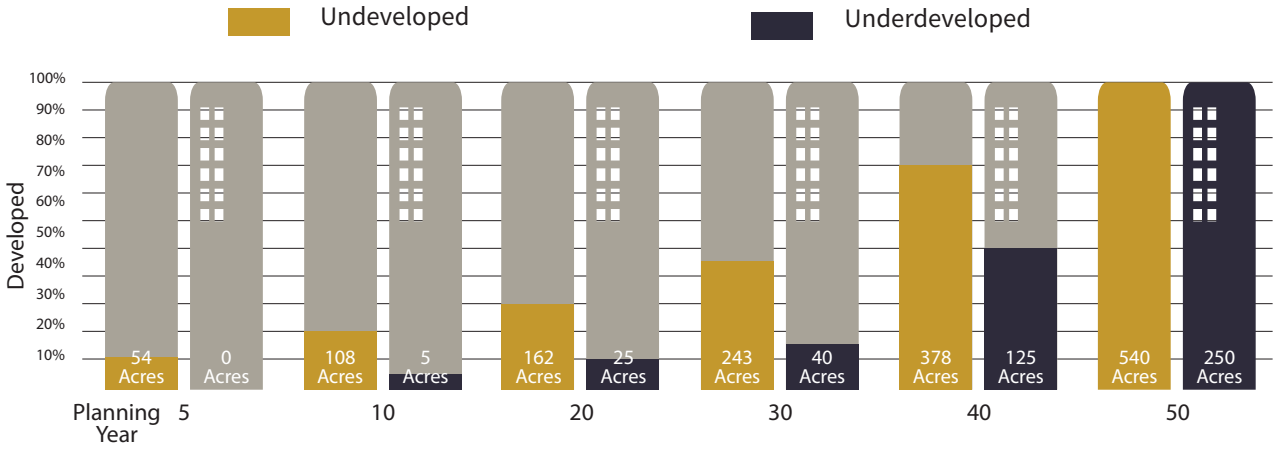


Figure 10. Industrial Development Acreage by Planning Year

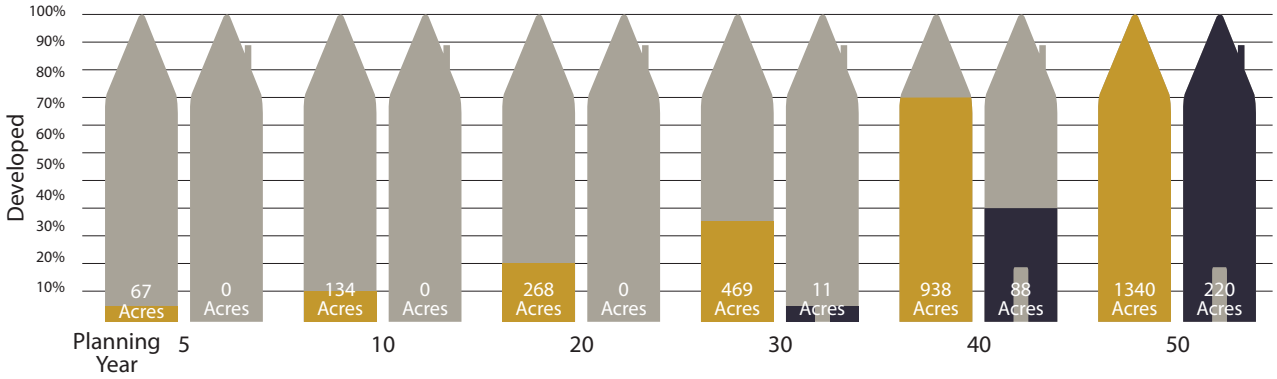


Figure 11. Planned Neighborhood and Neighborhood Residential Development Acreage by Planning Year

Missoula County has a valuable opportunity to set a strong foundation for urbanization by implementing the WIP and capitalizing on key opportunities. The role of the private sector in developing the Wye area is crucial and cannot be overstated. Those who are prepared to take risks and contribute to the Wye's potential should be viewed as essential partners in this endeavor. Opportunities for Public-Private Partnerships should be sought out to build a vibrant, healthy community with high taxable values per acre, benefiting everyone involved.

Infrastructure Needs

The Wye Infrastructure Plan is a pivotal journey for Missoula County, aiming to address current infrastructure deficiencies and pave the way for a more vibrant and prosperous future for this emerging neighborhood. By doing so, it fulfills the promise of a unified Missoula County and ensures that the Wye becomes a cornerstone of the county's growth and development. The following Infrastructure Needs Chapter outlines the infrastructure needs and deficiencies that must be overcome.

Legend

- Infrastructure Plan Study Area
- Industrial Center
- Commercial Center
- Neighborhood Residential
- Residential
- Planned Neighborhood
- Working Lands
- Agricultural
- Incorporated Cities and Towns
- Interstate
- Arterial or Collector
- Railroad
- Non-Motorized Path
- Intersection Improvements
- Sewer System Potential Location
- Water System Potential Location
- School Potential Location

Note: Arterial/Collector sections include multi-modal facilities

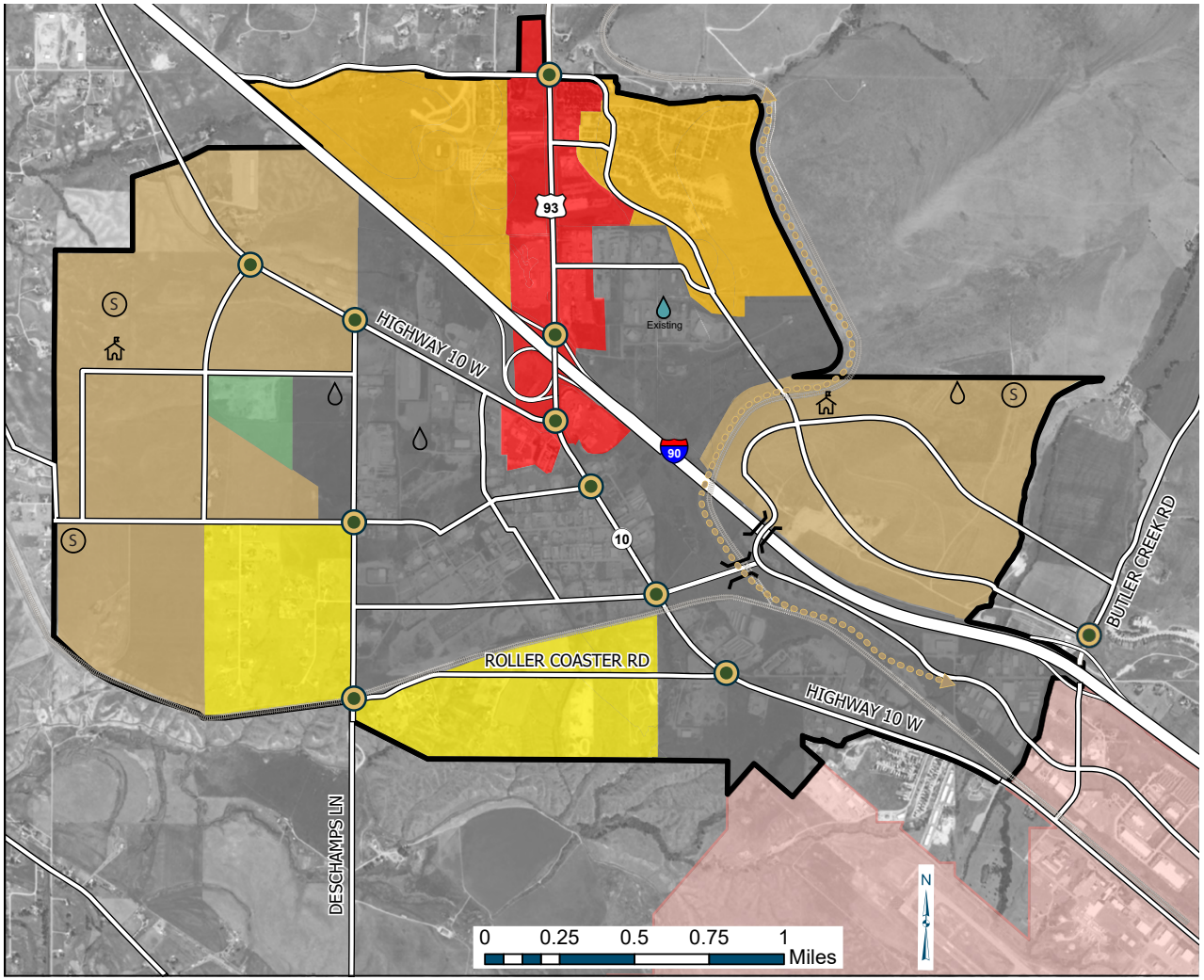


Figure 12. Conceptual Vision for the Wye

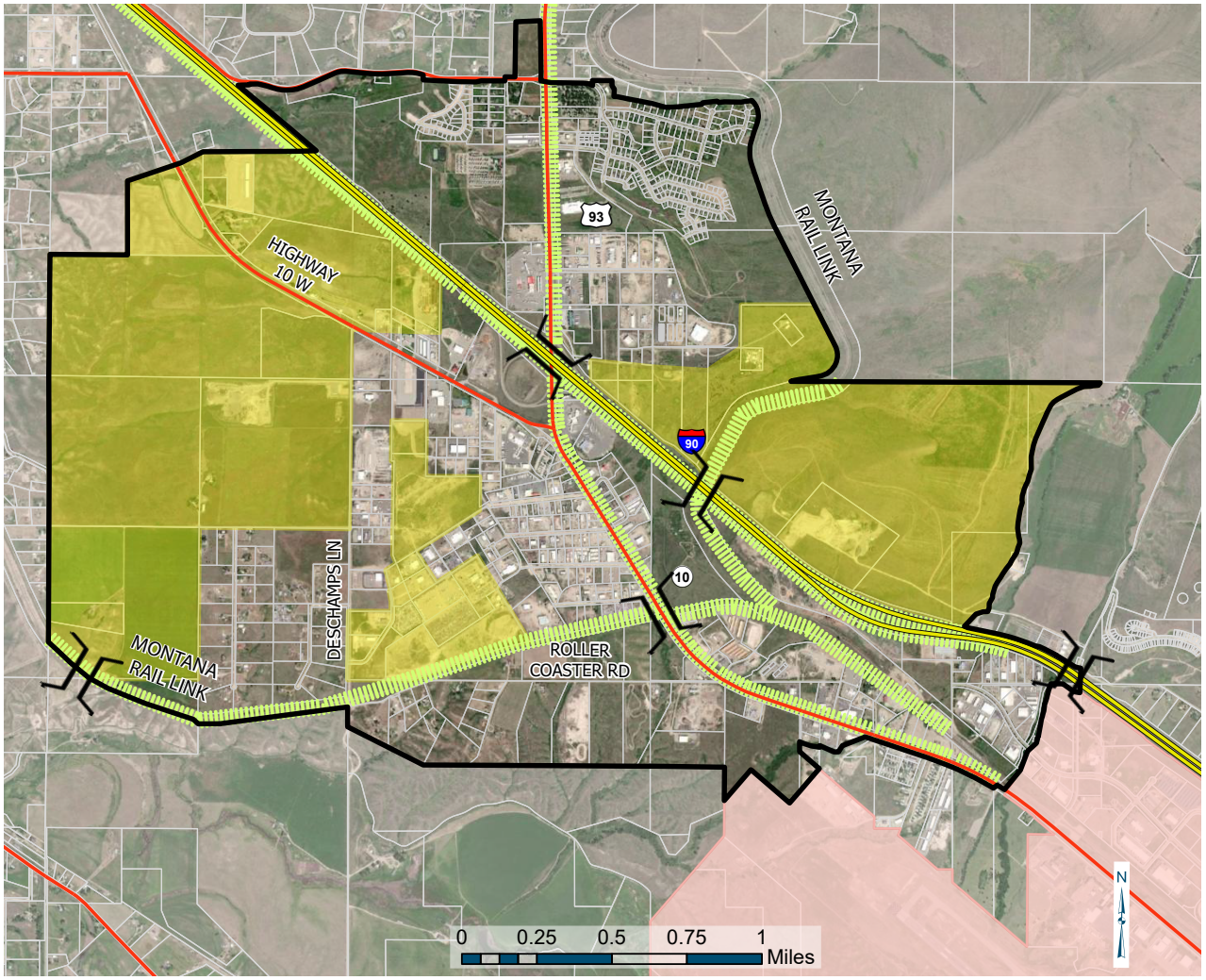


Figure 13. Underserved Transportation Areas

- Interstate
- Highway
- Existing Barrier to Connectivity within the Study Area
- Infrastructure Planning Study Area
- Incorporated Cities and Towns
- Underserved Transportation Area
- Property Lines
- Bridge

Street Network/Classification

The WIP area is located entirely within Missoula County and is known for its good regional access through Interstate 90, Highway 93, and Highway 10. These major roadways serve as the backbone for vehicular travel but pose challenges for non-motorized access and internal circulation within the neighborhood. Additional transportation infrastructure conditions within the WIP area that influence circulation include the following:

Vehicular Transportation

Strengths:

- Regional Access: The neighborhood enjoys excellent regional access via Interstate 90, Highway 93, and Highway 10, providing efficient connectivity to the urban core of Missoula and surrounding regions.
- Highway Network: The presence of these major highways enhances the accessibility and dispersal of vehicular traffic, reducing congestion during peak hours.

Challenges:

- Internal Circulation: The major highways within the WIP area can act as barriers for internal circulation. Crossing these highways, especially for pedestrians and cyclists, can be difficult or even impossible, hindering non-motorized access within the community.
- Lack of Internal Services: Travel outside of the WIP area is required for services.

Infrastructure Needs
Circulation

Non-Motorized Transportation

Challenges:

- Unpaved Roads: Numerous roads within the WIP area remain unpaved, discouraging non-motorized travel and posing challenges for residents.
- Lack of Non-Motorized Facilities: The major highways in the WIP area, including Interstate 90, Highway 10, and Highway 93, lack dedicated non-motorized facilities, such as sidewalks, bike lanes, and pedestrian crossings.
- Crossing Challenges: Interstate 90 is a limited-access route with only one overpass for Highway 93, an underpass for the BNSF railroad, and an underpass for Butler Creek Road on the eastern boundary of the WIP area. Unfortunately, other than the Butler Creek Road underpass, these crossings lack non-motorized facilities, making safe and convenient non-motorized access challenging.
- High-Speed Highway: Highway 93, with its high-speed design and up to five lanes of traffic, presents significant barriers to both motorized and non-motorized access. The absence of non-motorized facilities along Highway 93, except at the two signalized intersections of Highway 10 and Cartage Road, further exacerbates these challenges.
- BNSF Rail Crossings: The BNSF railroad lines bisect the WIP area, with only Highway 93, Deschamp Lane, and Interstate 90 crossing these lines. Among these, only Deschamp Lane offers an at-grade crossing, potentially making it expensive to expand existing grade-separated crossing infrastructure for non-motorized access.

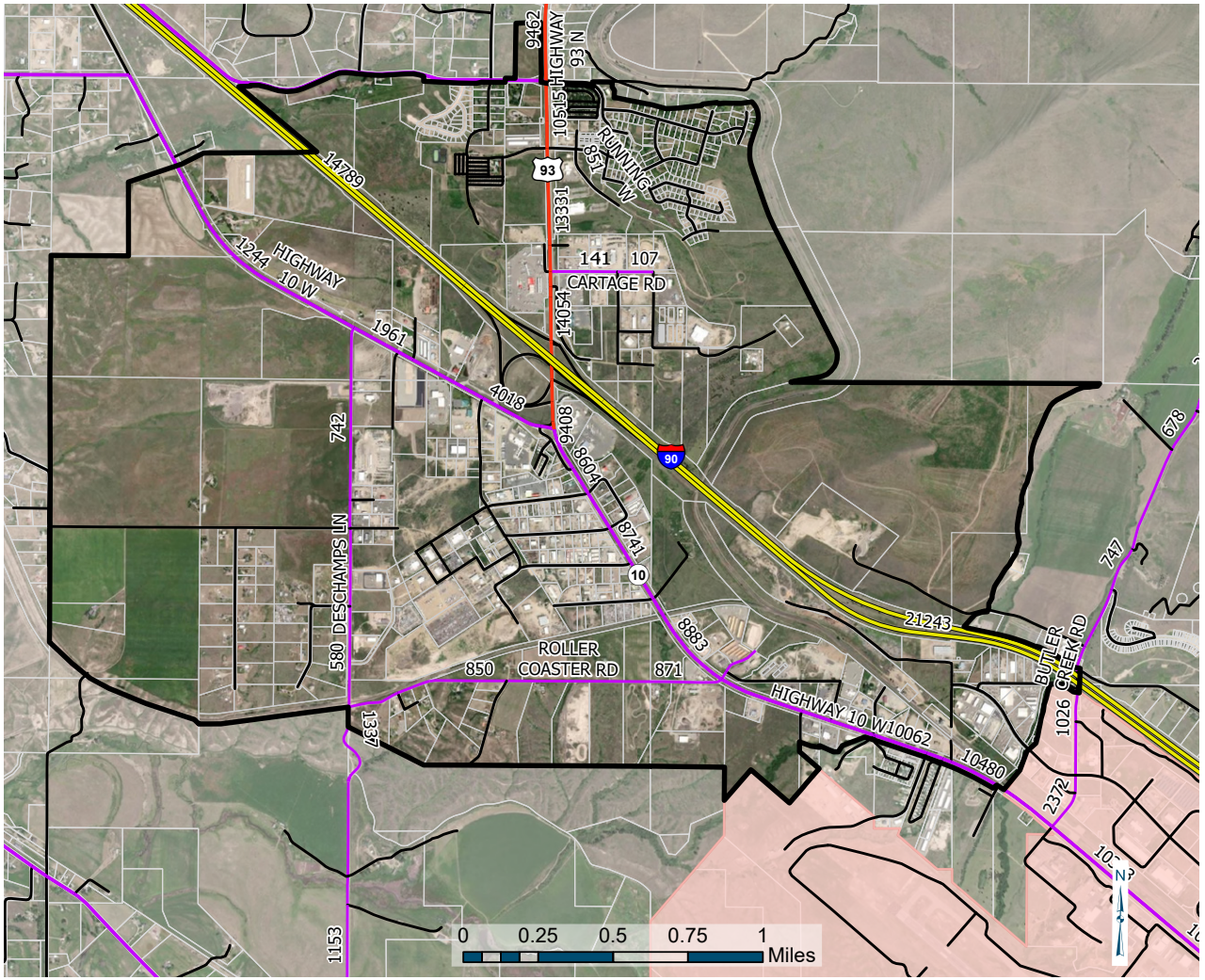


Figure 14. Transportation Demand Model **Based on 2018 volumes from the MPO model*

Figure 15. Interstate 90 Intersection

The Wye benefits from good regional access but faces significant challenges for non-motorized travel and internal circulation, particularly due to the lack of dedicated facilities and the unique characteristics of the transportation infrastructure within the WIP area. Addressing these issues is essential to enhance transportation circulation and promote safe, accessible, and efficient travel within the neighborhood.

Generally, uncongested conditions prevail on the streets within and bordering the WIP area. The exception to this is the westbound off ramp for the interstate that is beginning to show congestion during the PM peak hour. Existing average daily traffic (ADT) volumes within the project area are shown in Figure 14. These volumes represent the total two-way 24-hour volume of motorized traffic, and are based on actual traffic counts conducted by the City of Missoula.

The proposed growth in the WIP area, as outlined in the recent Missoula Area Land Use Element, marks a significant shift in density from the previous zoning regulations. The allowance for up to 10,000 to 15,000 additional residential units contrasts sharply with the prior cap of 1,200 units, potentially resulting in 90,000 to 135,000 daily trips within the WIP area (including industrial and commercial uses). Presently, the roadways demonstrate decent capacity, characterized by multiple lanes and signalized major intersections. However, addressing intersection operations, ensuring safety, fostering multimodal connectivity, and contemplating the expansion of the Mountain Line's Transit network are crucial steps in preparing for this growth. Strategically investing in multimodal infrastructure not only addresses the surge in vehicular trips but also aligns with the County's broader goals of reducing reliance on single-occupancy vehicles, subsequently mitigating both capital and maintenance costs.

Rail

The rail line that bisects the WIP area shown in Figure 13 is owned by Burlington Northern Santa Fe (BNSF). Historically this line was operated and maintained by Montana Rail Link, but MRL's lease expired on January 1st, 2024, at which time BNSF took over operations and maintenance of the line. The line splits in the WIP area with one branch heading north toward Arlee, MT., and the other branch heading west toward St. Regis, MT. The lines eventually merge in Paradise, MT before heading west into Idaho along the Clark Fork River.

Infrastructure Needs
Circulation

Transit and Non-Motorized

Mountain Line's route 11 ends/turns around just short of the WIP area at the Airport. No other transit services exist in the area. Non-motorized facilities are limited within the WIP area, with the exception of newer developments. The Meadowlands subdivision includes bike lanes along its collector roads, and sidewalks on all public roads. A small piece of shared-use path was recently installed along the south side of Highway 10 between Alita Drive and Highway 93, however this facility bends south with the right-of-way line and does not connect to the sidewalk/crosswalk facilities at the intersection of Highway 93 and Highway 10. The intersection of Highway 93 and Cartage Road includes sidewalk at it's corners to facilitate accessible crosswalks. No other non-motorized facilities exist in the WIP area.

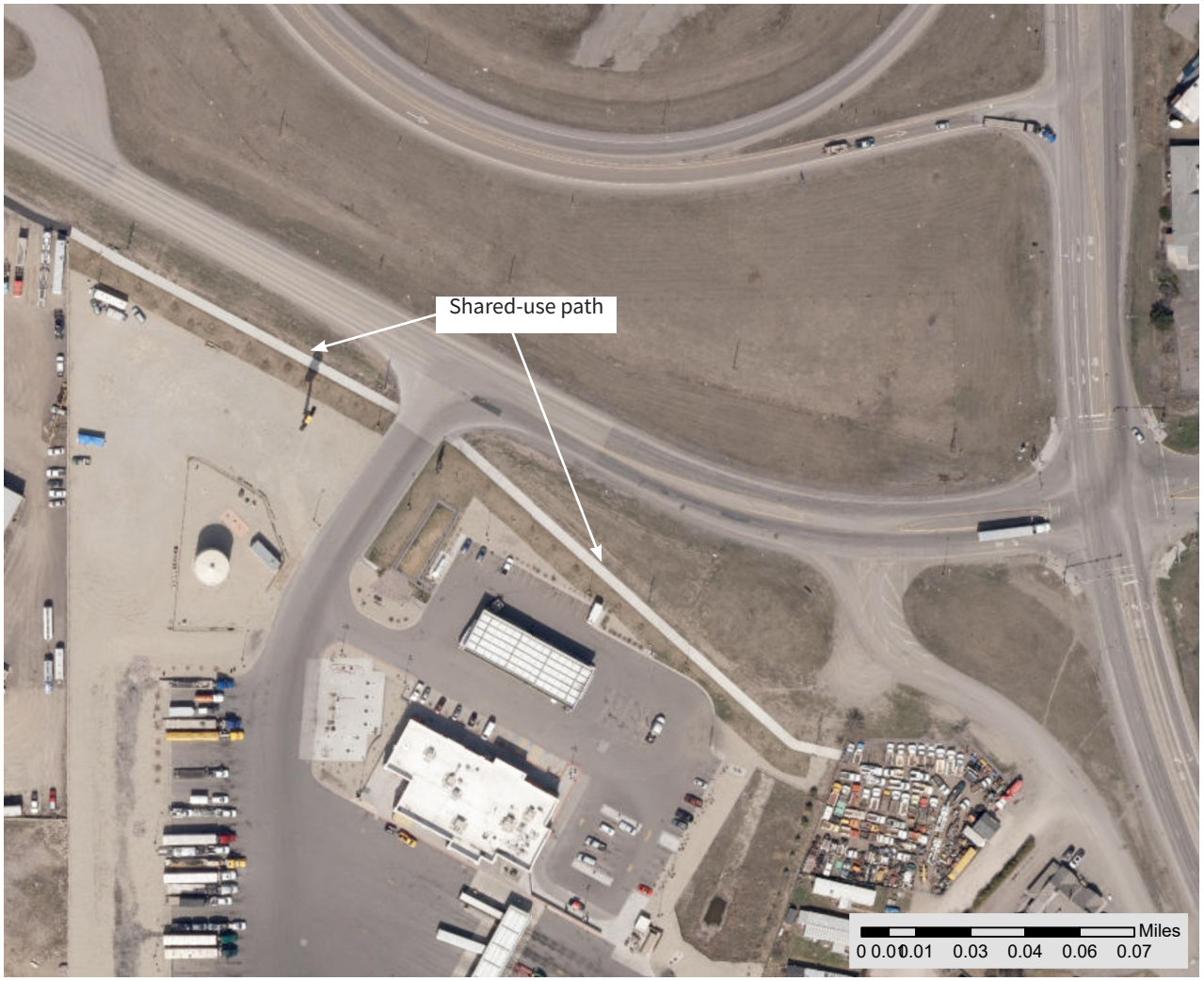


Figure 16. Highway 10 Shared-Use Path Without Connection to Highway 93 Intersection

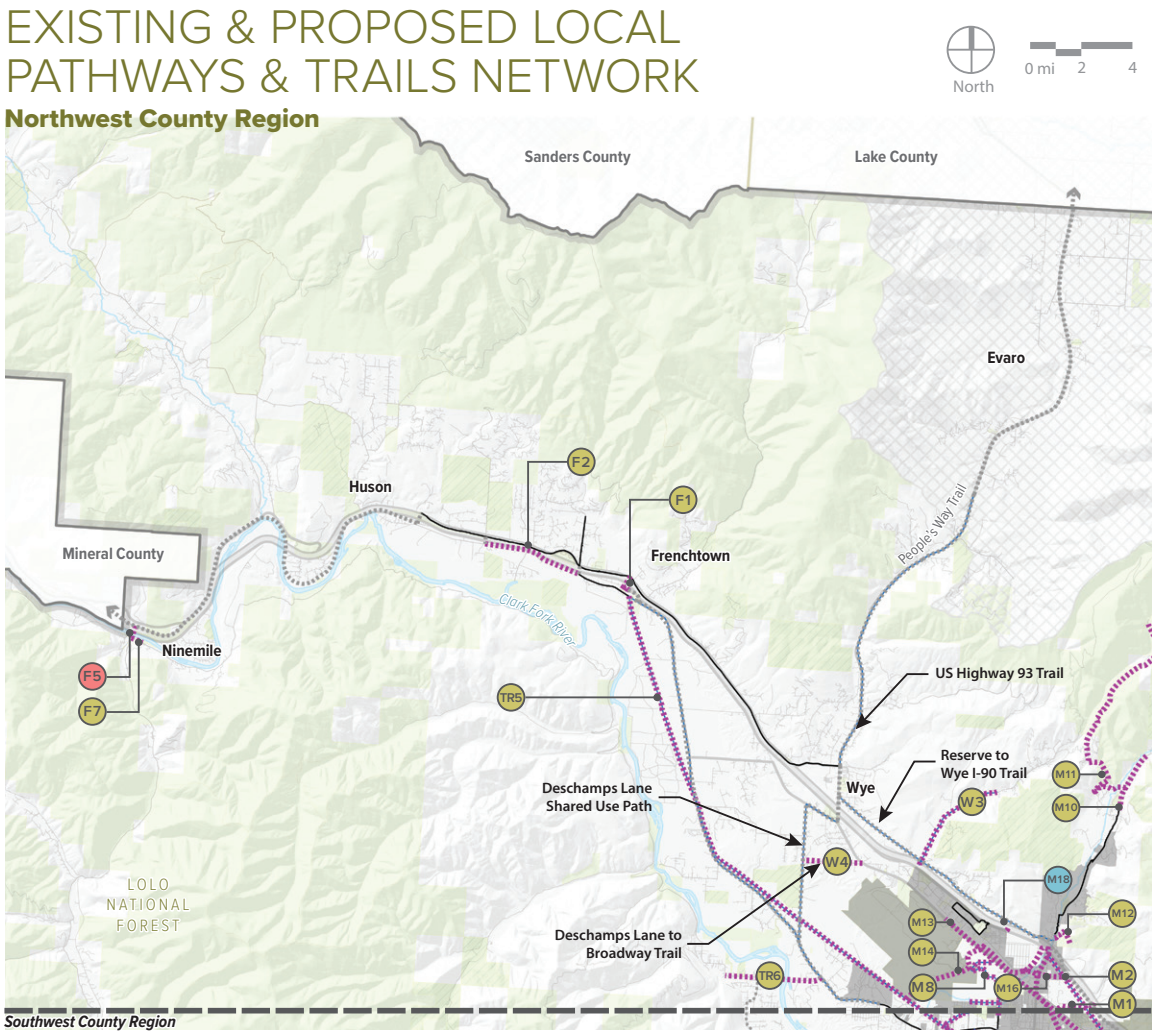


Figure 17. Existing Trail Network

Source: 2022 Missoula County Pathways and Trails Plan

- Existing Pathways and Trails
- Proposed Regional Connection Projects
- Proposed Local Enhancement Projects
- MPO Proposed Projects
- Proposed Projects
- Highway/Freeway
- Road
- Major Streams
- Tribal Land
- Public Lands
- City of Missoula

The Missoula County Pathways and Trails Plan includes a proposed trail from Deschamps Lane to Broadway along Roller Coaster Road as a Tier 1 Project. The Plan notes Tier 1 projects as having the highest ranking evaluation criteria and are geographically diverse within the county. Other proposed trails in the study area are the Highway 93 People's Way trail (Tier 3), the Deschamps Lane shared use path (Tier 1), and the Reserve to Wye I-90 Trail (Alt. 2 northern alignment) (Tier 2). Proposed trail alignments in the Missoula County Pathways and Trails Plan are conceptual and are meant to represent community needs for regional, recreational and local connections; additional planning and engineering is needed to identify specific alignments and their feasibility considering right-of-way, utility and other constraints. Additionally, the plan did not identify needed pedestrian infrastructure such as sidewalks or more minor connections within neighborhoods.

Infrastructure Needs
Right-of-Way

In the specified plan area, a comprehensive analysis of the existing conditions for collector roadway rights-of-way widths has been conducted, which is essential for planning and accommodating proposed typical sections and utilities. The following summary outlines the widths of these rights-of-way for each road segment:

County Road Right-of-Ways (60 ft wide):

- Deschamps Lane
- Cartage Road
- Roller Coaster Road

County Road Right-of-Way (Prescriptive Use of Road Prism Only):

- Butler Creek Road's right-of-way has long been assumed to be the standard 60 ft right-of-way width associated with typical county rights-of-ways, however, no declaration of this right-of-way has been discovered. Therefore its right-of-way is likely defined by prescriptive use of the road prism only, with no specific width. There is ample right-of-way width to traverse under the freeway.

MDT Right-of-Way (Varies, 160 ft typical, 140 minimum):

- Highway 10 West: 160 feet.
- Highway 93: Varies in width, 140 - 300 feet.

These existing conditions are critical in determining the available space for accommodating proposed typical road sections and utilities within the WIP area. Additional right-of-way may be needed to construct complete streets that accommodate users of all ages and abilities comfortably.

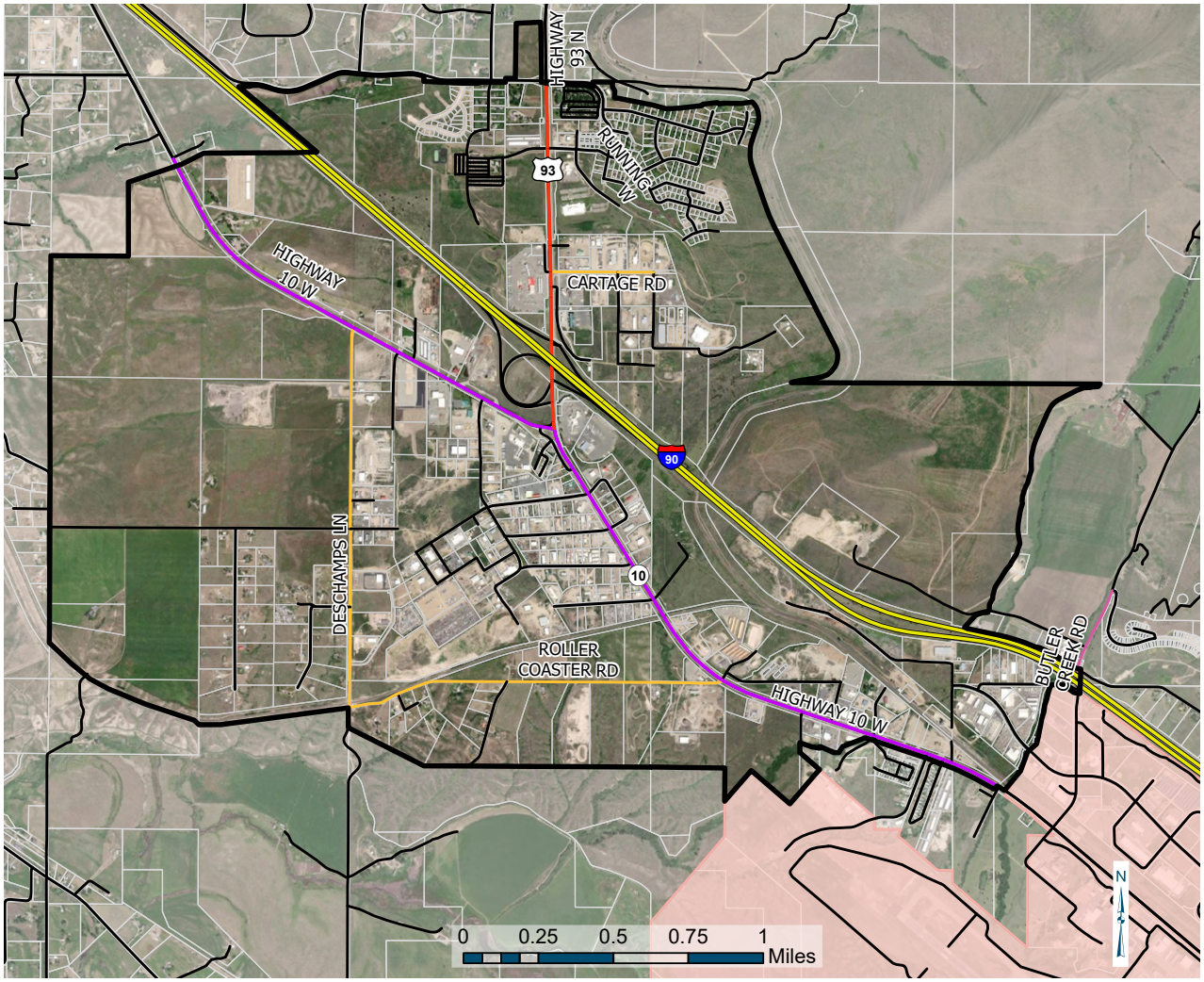


Figure 18. Existing Rights-of-Way

Planning Year	Undeveloped		Underdeveloped	
	Acres to be Developed	% to be Developed	Acres to be Developed	% to be Developed
5	**207**	10	**0**	0
10	**518**	25	**0**	0
20	**1036**	50	**101**	20
30	**1554**	75	**252**	50
40	**1865**	90	**404**	80
50	**2072**	100	**505**	100

Table 1. Development Acreage by Planning Year

Water & Wastewater Demand Calculations

The water and wastewater needs assessment is based on the population and build-out phasing for the WIP area. The following assumptions are made:

- 12 dwelling units per acre for undeveloped and underdeveloped land
- 2.3 persons per dwelling unit

The phasing plan in Table 1 is assumed for the time it takes to develop the available land in the WIP area. It is assumed that the undeveloped land will develop more over the first ten years than the underdeveloped parcels.

Infrastructure Needs

Water

Water allocation and infrastructure availability in the WIP area has been largely driven by the demand created from individual development opportunities. This has left many logical areas of development underserved or without water availability commitments. Underserved parcels in the WIP area are limited by a variety of reasons, including:

- No reasonable access to existing water mains
- No system for disbursing or sharing water improvement costs
- No documented water availability commitments
- Lack of local water related capital to implement system improvements to proactively facilitate desired development
- Lack of water system capacity to provide required water demand
- Lack of fire flow/fire protection for denser development and commercial industrial development
- Difficulty presented by obtaining new water rights

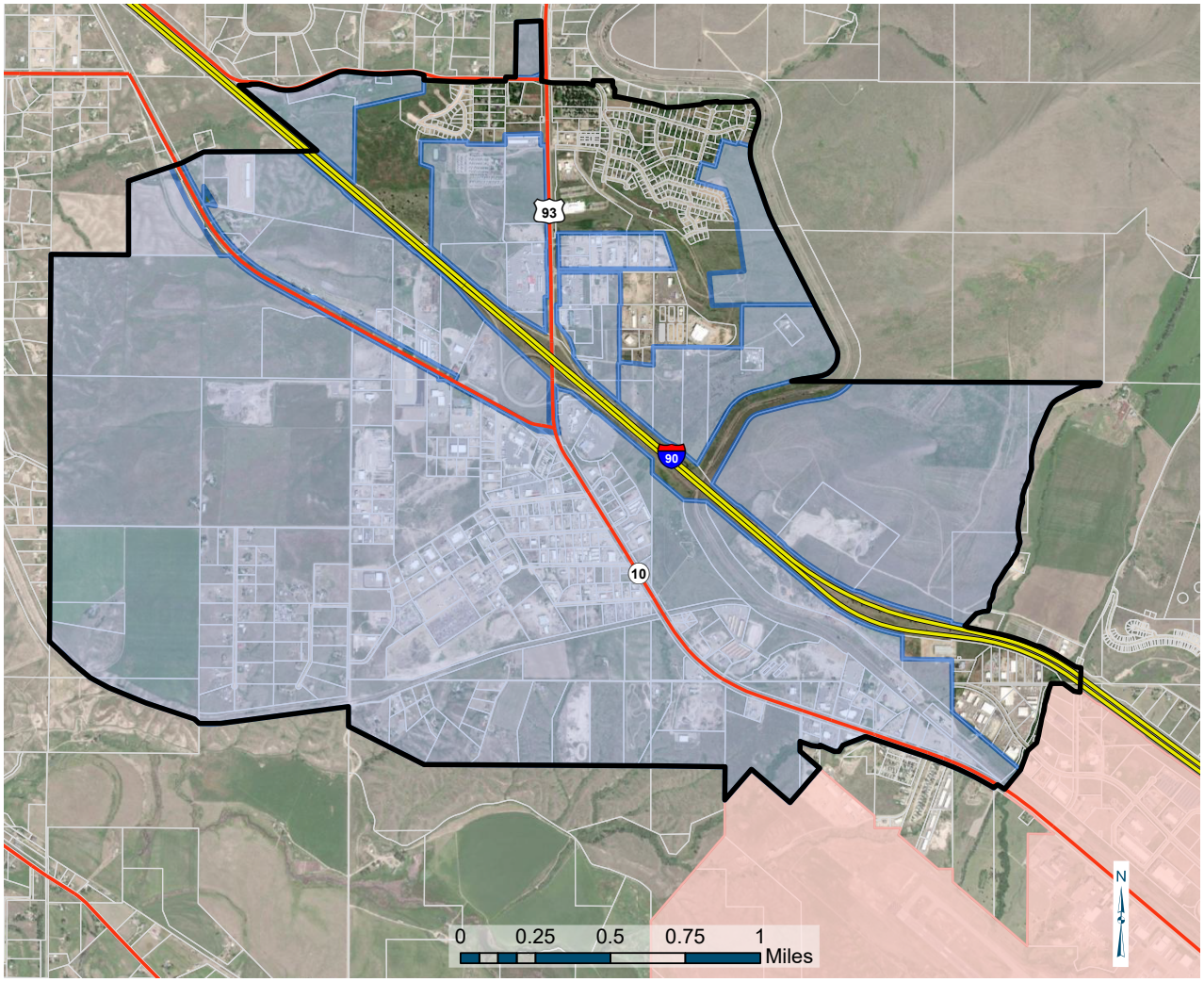


Figure 19. Underserved Water Areas

Year	Projected Water Demand (MGD)		
	Residential	Commercial/ Industrial	Total
5	0.76	0.10	0.86
10	1.90	0.26	2.16
20	3.80	0.52	4.32
30	5.70	0.78	6.48
40	6.84	0.94	7.78
50	7.60	1.04	8.64

Table 2. Projected Water Demands in Million Gallons per Day (MGD)

Projected Water Demand

In calculating the projected water demand, 2.3 persons per dwelling were assumed, as recommended by the Missoula City Public Works Standards and Specifications Manual. Unlike the sewer demand, no areas of water demand are currently slated to be supplied by the City System. Therefore, the developed water demand for the projected development, shown in Table 2, represents the total water demand.

A conservative estimated projected flow rate of 160 gallons per capita day (gpcd) was used, based on the average water use for surrounding, similarly sized cities: Missoula, MT, Billings, MT, Bozeman, MT, and Rapid City, SD. Flow projection figures based on square footage for various industrial and commercial applications were taken from the 2012 Commercial Buildings Energy Consumption Survey[1] and applied to parcels zoned as commercial or industrial. A projected flow rate of 0.025 gallons per day/square foot (gpd/sq ft) was used for commercial space, and a projected flow rate of 0.06 gpd/sq ft was used for industrial space. The allocation of phasing for development includes the associated acreage for undeveloped and underdeveloped acreage shown previously. For that reason, developed areas that are served by small public water supply or private wells aren't included in the future water demand projections.

Existing Infrastructure and Capacity

The existing infrastructure in the Wye area is a mix of individual wells, small public water systems serving neighborhoods and underdeveloped areas (with minimal water rights available).

Alternatives screening performed during the Wye Area Regional Water System Preliminary Engineering Report (2010) determined the best options for providing public water service to the Wye Area are the creation of a water district and expansion of the City of Missoula Water System.

As detailed in the 2019 City of Missoula Facility Plan, the North pressure zone is the closest in proximity to the Wye Area Development. This pressure zone includes seven wells and one storage facility. According to the 2019 Facility Plan, this pressure zone has the highest fire flow requirement; 3,500 gpm fire flow for a 3-hour duration. The North pressure zone has a projected average day demand capacity of 9.63 million gallons (MG) for 2037.

Although the North pressure zone is predicted to meet projected 2037 demand, the Wye Area Development was not included in the 2037 projected demand for this pressure zone. Due to the large water demands of the Wye Area upon development, any alternative will require new supply and storage.

1 https://www.eia.gov/consumption/commercial/about.php

Infrastructure Needs
Water

A NOTE ABOUT FIRE FLOW REQUIREMENTS

The fire flows required for a specific development, building, or land use are guided by the International Fire Code and set by the local fire marshal or the jurisdiction having authority (JHA). The State of Montana has adopted IFC 2021 and the fire flow requirements for buildings are included in Appendix B. Typically the lowest fire flow requirement is 1,000 gpm for 1 hour with increasing requirements based on building type, size, and availability of an automatic sprinkler system.

Water Source Requirements

Source water for the expansion of the Wye area water system will be sourced from ground water wells as there is no viable surface water option. As indicated in the Wye Area Regional Water Supply System Groundwater Evaluation report, the Missoula aquifer is known to be prolific, capable of producing supply water to meet the projected water demand, and in general of good water quality, however the water rights are challenging. Expansion of the populace and water demands in the Wye area will require significant new water resources. These new water rights must not adversely affect others in the area who are currently apportioning water, including agricultural as well as existing residential water consumers. Many areas that are seeking to develop land for new residential developments are being challenged by the claim that these new water consumers will adversely impact the current wells and groundwater resources and should not be allowed to develop. All of this will need to be considered in the alternatives analysis.

MDEQ Circular-1, Section 3.2 provides guidance on groundwater source capacity requirements stating that the "total developed ground water source capacity for systems utilizing graving storage or pumped storage, unless otherwise specified by MDEQ, must equal or exceed the design maximum day demand with the largest producing well out of service. A minimum of two sources of ground water must be provided."

Water Storage Requirements

In general water storage facilities should meet three main objectives:

- Moderate the fluctuations during normal operations between supply and demand in the distribution system (Equalization Storage)
- Provide storage for fire protection in each pressure zone (Fire Flow Storage)
- Provide emergency supply (Emergency Storage)

The following recommendation is from the MDEQ Water Works Standards:
Storage facilities must be sufficient, as determined from engineering studies, to supplement source capacity to satisfy all system demands occurring on the maximum day, plus fire flow demands where fire protection is provided.

Section 7.01 of the MDEQ standard goes on to state:
a. The minimum allowable storage must be equal to the average day demand plus fire flow demand, as defined below, where fire protection is provided.

- Any volume less than that required under a. above must be accompanied by a Storage Sizing Engineering Analysis, as defined in the glossary. Large non-residential demands must be accompanied by an Emergency Storage Sizing Engineering Analysis and may require additional storage to meet system demands.
    - Storage Sizing Engineering Analysis: A detailed engineering study that includes diurnally-peaked water usage demands during the maximum day and subsequent and preceding days, operational storage volume requirements, reserve standby storage requirements, dead storage volume, and extended time reservoir mass flow analysis for the maximum day demand with the required fire flow, when fire protection is provided, occurring during the hours of peak demand. The required design storage volume must be determined with the largest well, largest treatment train, or the largest booster pump out of service and must include provisions for auxiliary power.
- Where fire protection is provided, fire flow demand must satisfy the governing fire protection agency recommendation, or without such a recommendation, the fire code adopted by the State of Montana.
- Each pressure zone of systems with multiple pressure zones must be analyzed separately and provided with sufficient storage to satisfy the above requirements.
- Excessive storage capacity should be avoided to prevent water quality deterioration and potential freezing problems.

While sites on the north side of highway have adequate elevation for gravity service, water tanks on the south side of highway would either need to be elevated (on legs) or coupled with booster stations to provide volume and pressure to local services and fire protection.

Infrastructure Needs

Wastewater

Some of the WIP area is served by Wye Area Sanitary Sewer Rural Special Improvement District (RSID) #8489. Since portions of the WIP area fall outside of the RSID service area and a phased system has not been adopted to further expand into the planning area, there are parcels that are limited or underserved for the following reasons:

- Sewer main extensions or connections have not been allowed by the City for locations outside the utility service area boundary
- New lift stations are required for service and are cost prohibitive for a single development project to undertake. Late-comer agreements and memorandums of understanding have been unsuccessful at distributing the cost of improvements
- Current lift station capacities are limited and require costly upgrades to provide additional service
- No reasonable access to existing sewer mains
- Soil drainage in the area makes on-site treatment systems difficult and limits the density available to maintain groundwater quality
- Specific centralized treatment for the area doesn't yet exist; difficulty in permitting discharge

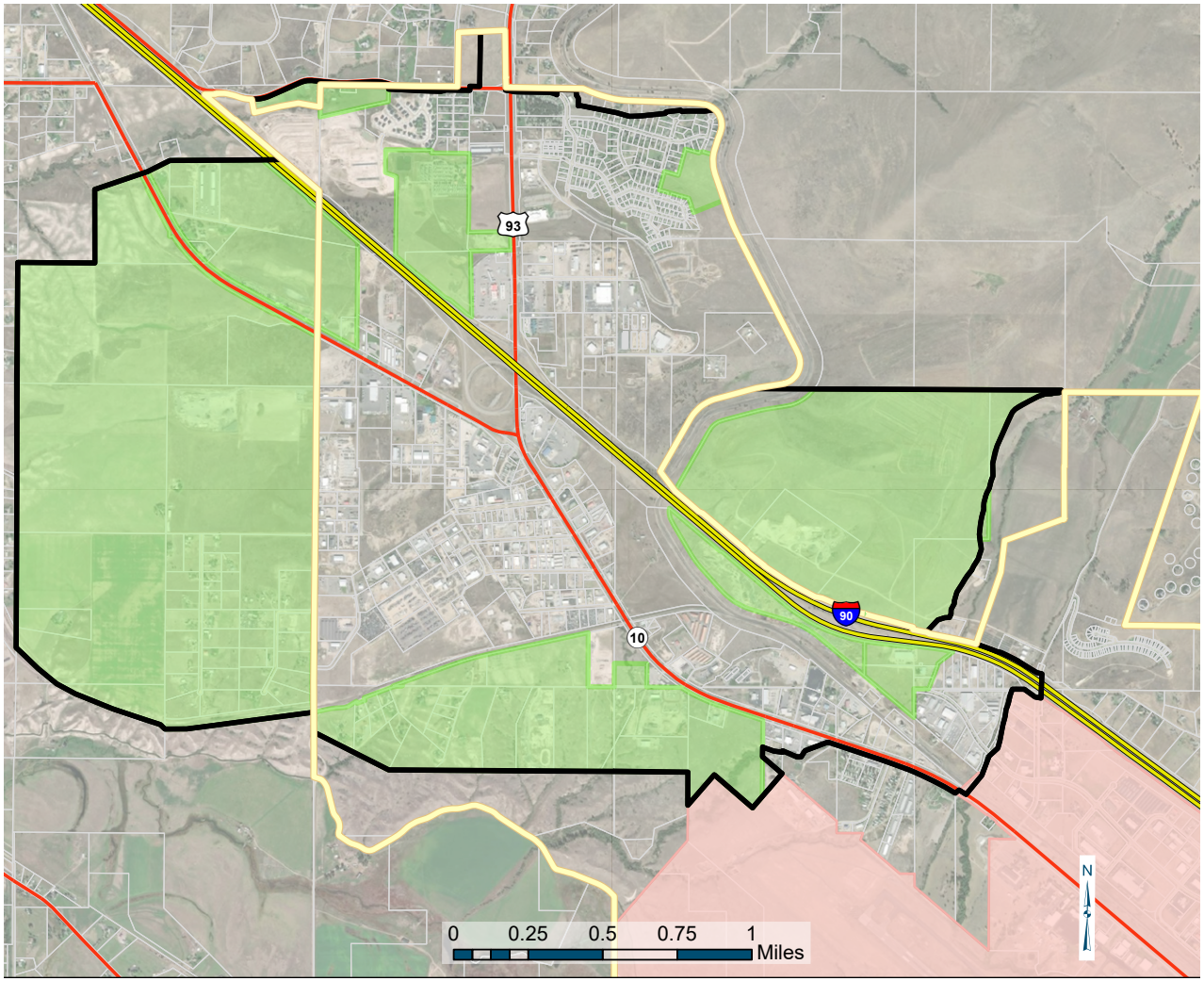


Figure 20. Underserved Sewer Areas

Year	Projected Wastewater Demand (MGD)		
	Residential	Commercial/ Industrial	Total
5	0.33	0.06	0.40
10	0.83	0.16	0.99
20	1.67	0.32	1.99
30	2.50	0.48	2.98
40	3.00	0.58	3.58
50	3.33	0.64	3.97

Table 3. Projected Wastewater Demands

Projected Wastewater

To calculate projected wastewater loadings, 2.3 persons per dwelling were assumed as recommended by the Missoula City Public Works Standards and Specifications Manual. A projected flow rate of 100 gpcd was also used, consistent with MDEQ Circular 2. An approximation of 80% of industrial and commercial water demand was used to approximate wastewater demand. A projected flow rate of 0.05 gpd/sq ft was used for commercial space, and a projected flow rate of 0.02 gpd/sq ft was used for industrial space. There is a large portion of the WIP area that is included in the Wye RSID providing wastewater service in the County with a system that conveys wastewater to the City of Missoula System. The allocation of phasing for development includes the associated acreage for undeveloped and underdeveloped acreage shown previously. For that reason, developed areas that are served by RSID and City of Missoula system aren't included in the future wastewater demand projections shown in Table 3. If the RSID sewer service area were to redevelop at the higher densities assumed for this study, the total flow for the 50-year period would be 5.58 MGD. Growth within the existing RSID could require that the City revisit the commitments with the RSID and plan for the increased flow in from this area.

Existing Capacity

In January 2008, RSID 8489 was formed to provide sewer service to more than 250 properties. The service area for the WIP study includes 539 parcels which will be immediately served by the wastewater facilities, at an anticipated density of development.

The RSID discharges into the City of Missoula's system at the Momont Development Park. The capacity of the Momont No.1 and No.2 Lift Stations were evaluated to be 600 gallons per minute (gpm) and 1,000 gpm, respectively, in the 2019 Missoula Wastewater Facility Plan. Based on the facility plan, Lift Station Momont No.2 will experience inadequate capacity for the predicted population loading which did not account for the WIP Study Area development loading. Further evaluation and coordination with the City of Missoula will be required to determine the City's ability to take additional wastewater than what was planned in the RSID development.

According to the 2019 City of Missoula Facility Plan, the wastewater treatment plant is now designed for an average daily flow of 12 million gallons per day with a 2037 projected average day flow of 11.2 million gallons per day. Hydraulically, the plant could handle 2037 average and maximum month flows, but would be challenged at projected 2037 maximum day and peak hour flows. Further analysis would be required to determine at what year the plant will exceed capacity and what expansion will be required to accommodate the additional Wye area capacity.

Infrastructure Needs
Stormwater

CLIMATE CHANGE CONSIDERATIONS

In some climate change scenarios examined by Climate Ready Missoula, annual precipitation is expected to concentrate in the fall, winter, and spring months, potentially leading to more rain on snow events, increased flooding, and higher seasonal groundwater. The WIP area is particularly susceptible to these impacts from climate change due to its insufficient drainage systems.

Existing Conditions

The study area contains nine major drainage basins. Some basins extend off-site well beyond the WIP boundary to the north and northeast, including the headwaters of LaValle Creek, Butler Creek, and O'Keefe Creek, although only small portions of these streams flow through the study area itself. The Grass Valley French Ditch lies to the south and intercepts several ephemeral drainages from the WIP area before they reach LaValle Creek.

The current stormwater infrastructure is identified in Figure 22 on page 35. Existing development in the study area is primarily served by open channel drainage systems and roadside ditches that feed into natural ephemeral drainages. The open channel system is fragmented, and there are many locations where no roadside ditches exist to perpetuate drainage patterns. The result is nuisance flooding and road damage (due to saturation), which is particularly predominant in the central commercial area bounded by Highway 10 (east and north), the railroad (south), and Deschamps Lane (west).

Major road corridors (I-90, Highway 10, and Highway 93) and the railroad all present interference to natural drainage patterns. Culverts of appropriate size are located at most critical crossing locations; however, some culverts are in poor condition or plugged with sediment. Except for the Missoula Meadowlands subdivision, formally Running W Ranch, located in the northern study area east of Highway 93, there are no significant piped storm drain systems. The Missoula Meadowlands storm drain system is currently small, but there are plans to substantially expand it as the subdivision builds out.

Numerous small stormwater detention basins exist within the WIP area, most of which serve single developed sites or small subdivisions. The Missoula Meadowlands subdivision contains a relatively large stormwater detention basin that serves the entire subdivision as well as the U.S. Army Reserves site on Running W Road. There are no publicly owned regional detention facilities within the WIP area.

The WIP area is currently split by the administrative boundary for the County's Municipal Separate Storm Sewer System (MS4) program. Missoula County performs stormwater reviews within the MS4 boundary while MDEQ performs stormwater reviews outside the MS4 boundary. The two entities have different stormwater design requirements, thereby creating inconsistent infrastructure implementation and levels of service.

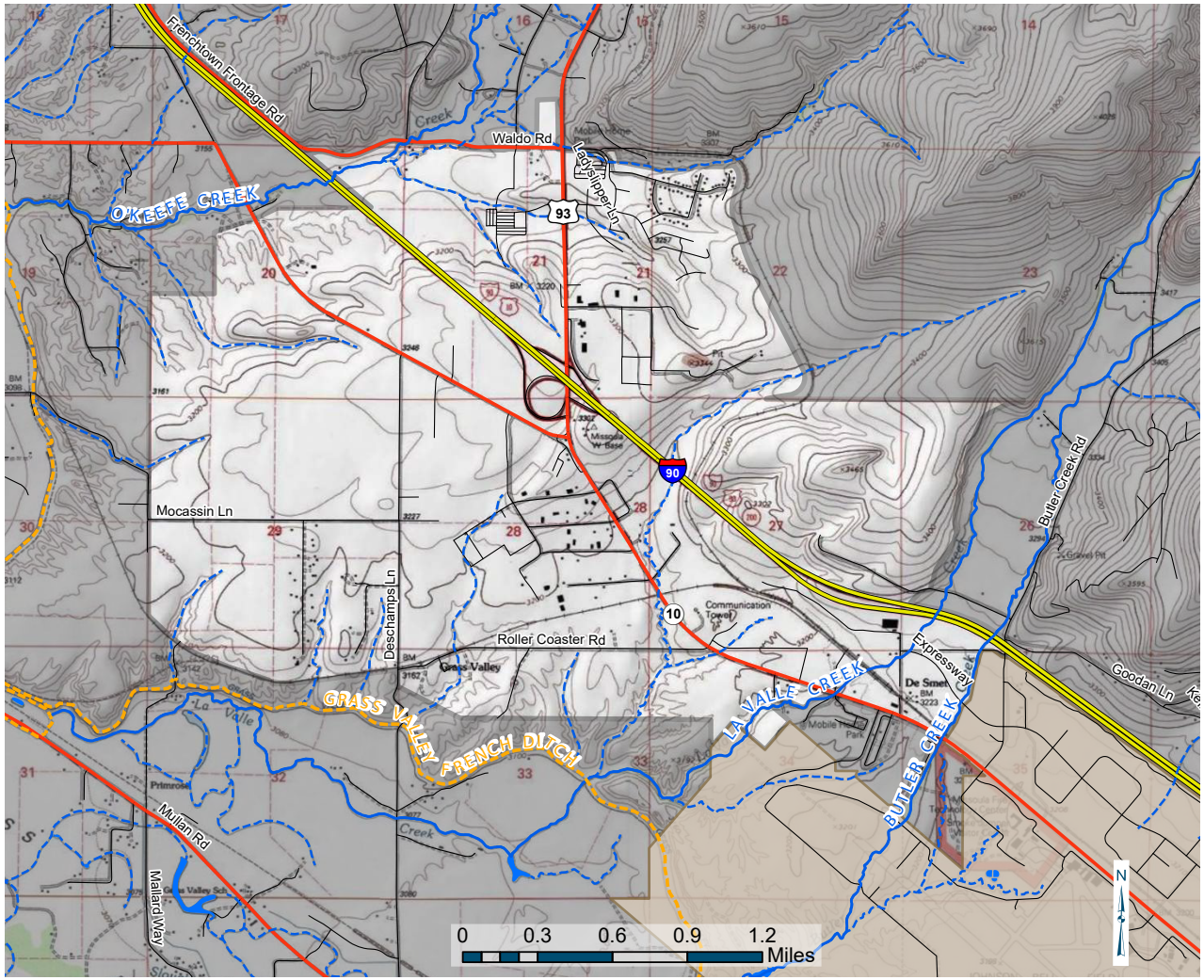


Figure 21. Wye Area Hydrography

- Interstate
- Highway
- Other Roads
- Infrastructure Planning Study Area
- National Hydrography Dataset (NHD) Lake/ Pond
- Incorporated Cities and Towns
- Perennial Stream/River
- Ephemeral Stream/River
- Canal/Ditch

Existing Conditions

The WIP area is predominantly situated on high ground between O'Keefe Creek, La Valle Creek, and the Grass Valley French Ditch. Most parcels drain to small ephemeral streams that serve as critical arteries during runoff. Many of the ephemeral drainages do not have well-defined bed and banks, and several have been highly altered or destroyed by development. This has led to issues with nuisance flooding in developed areas and has left some parcels stranded with no access to suitable receiving drainages.

The study area is comprised mostly of tight fine-grained clay and silt soils (predominantly hydrologic soil groups C & D) that do not readily infiltrate runoff. Land cover is comprised of a mix of commercial and residential development, as well as undeveloped parcels with primarily grass cover and very few trees. The tight soils and lack of tree cover create a combination that can cause quick intense peak runoff flows during larger rainfall events, especially if soils are frozen.

Groundwater in the WIP area is also a challenge. The clay and silt soil strata often creates semi- or impermeable geologic layers and hanging complexes of groundwater that will create unexpected springs during excavations for development. If this is an unplanned situation, nuisance flooding can occur in roads, yards, and basements. Research by the Missoula Water Quality district has also revealed an unusual trend of rising groundwater within the O'Keefe Creek drainage.

Infrastructure Needs
Stormwater

Existing stormwater infrastructure is identified in Figure 22 with descriptions of culvert conditions provided in Table 4 on the following page.

Legend

- Stormwater Detention Basin
- Impacted/Destroyed Drainages
- Roadside Conveyance
- Drainage Basin Boundary

Streams

- Perennial
- Ephemeral

Culverts

- Major (>24” Diameter)
- Minor (< =24” Diameter)

Culvert Condition

- Unknown
- Fair
- Good
- Poor
- Property Lines
- Infrastructure Planning Study Area

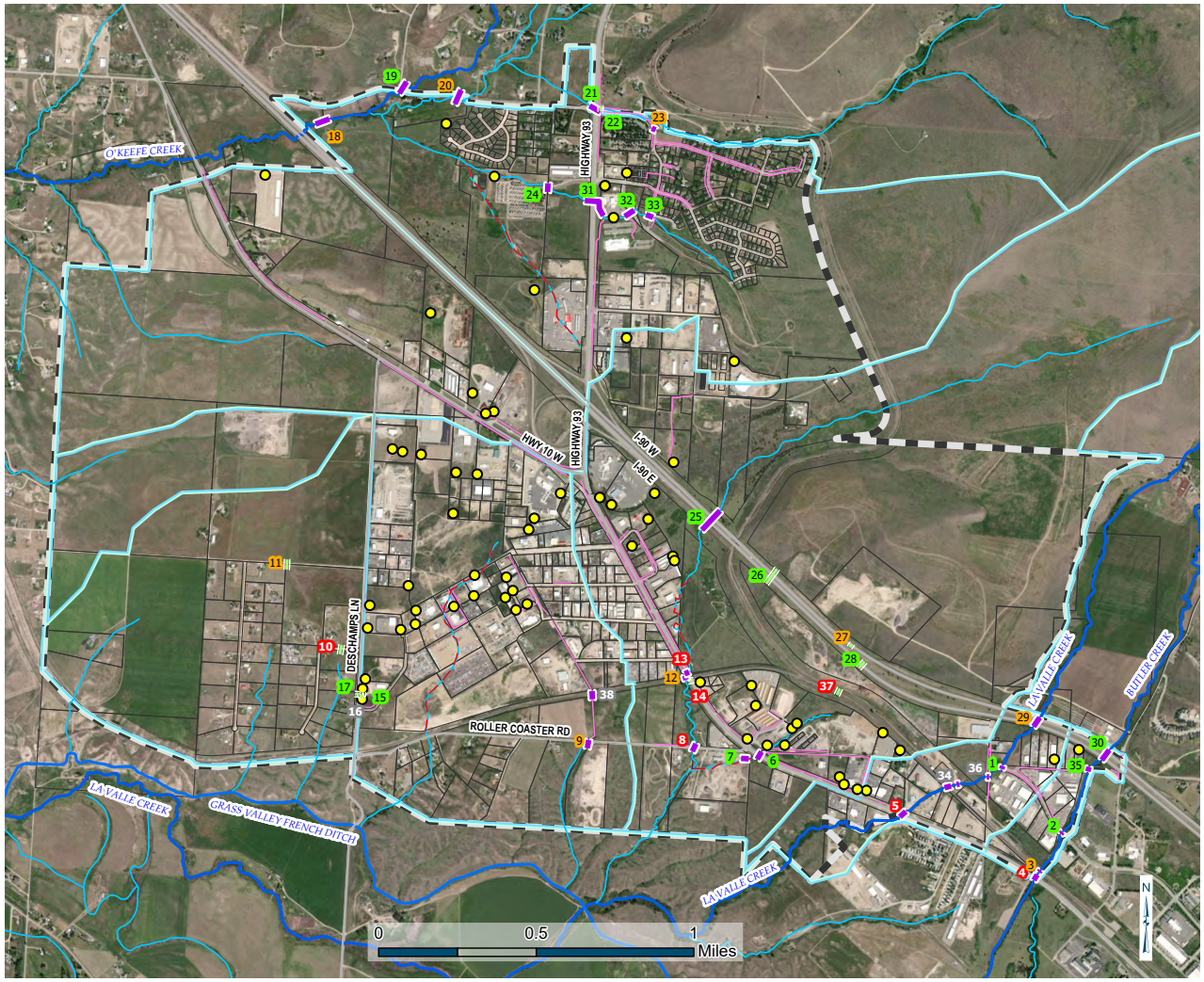


Figure 22. Existing Stormwater Infrastructure

Culvert No.	Size	Material	Condition	Notes
1	36" x 72"	Concrete	Good	La Valle Creek under Expressway Avenue.
2	48" x 96"	Concrete	Good	Heavy vegetation at outlet.
3	-	Mixed	Fair	Railroad bridge span. Concrete top and sides, soil bottom.
4	48" x 96"	Concrete	Poor	Channel on outlet side is full of willow root system.
5	72"	HDPE	Poor	Culvert outlet mostly filled by sediment.
6	72"	RCP	Good	Discharges to a local topographic depression with no outlet.
7	30"	HDPE	Good	Could not locate other end of pipe.
8	24"	HDPE	Poor	Mostly filled with sediment.
9	24"	CMP	Fair	Ephemeral drainage under Roller Coast Road.
10	8"	CMP	Poor	Appears to be 95% full.
11	12"	RCP	Fair	
14	36"	CMP	Poor	Full of sediment. Lots of edge damage.
12	48"	CMP	Fair	Partially full of sediment.
13	24"	RCP	Poor	Estimated as 24". Mostly filled w/ sediment. Double barrel at inlet and single outlet. One buried?
15	12"	HDPE	Good	Culvert for flow from upper to lower detention pond.
16	18"	CMP	Good	Detention pond outlet pipe.
17	18"	CMP	Good	Estimated 18". Deschamps Lane culvert. Conveys detention pond discharge to downstream residential property.
18	48"	CMP	Fair	Showing signs of corrosion.
19	60"	CMP	Good	Estimated as 60"
20	18"	CMP	Fair	Estimated as 18"
21	36"	CMP	Good	
22	24"	CMP	Good	
23	36"	CMP	Fair	
24	12"	CMP	Good	
25	36"	CMP	Good	
26	36"	CMP	Good	
27	24"	RCP	Fair	Separated barrell section.
28	24"	RCP	Good	
29	2 x 36"	CMP	Good	Two (2x) barrels of estimated 36" CMP. Unable to access.
30	72"	CMP	Good	Unable to access, estimated size and assumed condition.
31	36"	CMP	Good	
32	42"	HDPE	Good	
33	42"	HDPE	Good	
34	-	-	-	Mapped from aerial imagery.
35	48"x96"	Concrete	Good	Concrete box culvert under Interstate Place.
36	36"x72"	Concrete	Good	Concrete box culvert under Desmet Road.
37	-	-	Poor	Unable to verify. Possibly plugged and/or undersized.
38	-	-	-	Mapped from aerial imagery, 10-foot LiDAR contours, and NHD ephemeral drainage.

Table 4. Culvert Conditions

Note: Cells with "-" indicate culverts that were not field verified.

Infrastructure Needs
Stormwater

Stormwater Needs Assessment

The following summary outlines stormwater infrastructure deficiencies in the WIP area with locations identified in Figure 23 on page 39.

Drainageways

- Ephemeral streams and natural drainageways have been manipulated and destroyed in several locations, causing them to be non-functional or undersized.
- Lack of drainage conveyance infrastructure has resulted in developed parcels discharging concentrated stormwater onto adjacent private property with unsuitable drainageways to receive it. This is causing flooding and erosion issues even when detention facilities are in place.
- Some undeveloped parcels are stranded and do not have appropriate discharge points for concentrated stormwater overflows from detention facilities.

Commercial Core Area (South of I-90 and west of Highway 10)

- There is a general lack of consistent conveyance infrastructure and appropriate receiving drainages. The central ephemeral drainageway that historically carried water from this area to the south toward the Grass Valley French Ditch has been destroyed by development and is no longer functional.
- Roadside ditches are highly fragmented, so runoff often ponds on and alongside roadways.
- Many private detention facilities appear

undersized, and they do not consistently discharge to suitable and safe locations.

Runoff Treatment

- Requirements for runoff treatment are relatively new, and legacy detention facilities are not designed to meet treatment requirements.
- Specific stormwater quality treatment requirements and design standards are not outlined in detail within the County public works manual.

Culverts

- Several major culverts (24” or larger) have been poorly maintained and are plugged with sediment and debris, increasing flood risk to adjacent structures and roadways.
- Several culverts have been identified as undersized and/or in poor condition.

Administrative

- Stormwater detention features reviewed by the County are designed for the 100-year rainfall event while those reviewed by MDEQ are designed for the 10-year event.
- There are no detailed standards for stormwater quality treatment or conveyance design in the County public works manual.
- The County public works manual specifies that natural drainageways should be preserved, but there is no clear methodology or planning document to define critical drainageways.

Infrastructure Needs
Stormwater

Legend

- Stormwater Detention Basin
- Impacted/Destroyed Drainages
- Roadside Conveyance
- Drainage Basin Boundary
- Property Lines
- Infrastructure Planning Study Area

Streams

- Perennial
- Ephemeral

Culverts

- Major (>24” Diameter)
- Minor (< =24” Diameter)
- Deficiency Area
- Deficiencies

Figure 23. Underserved Stormwater Areas

Deficiencies as identified in Figure 23

- D1 Possible undersized culvert in a major ephemeral drainageway.
- D2 Significantly undersized culvert under driveway to Granite Peak RV resort. Conveys ephemeral drainage with frequent large flows.
- D3 High density commercial area with very little stormwater detention and treatment facilities. Fragmented conveyances. Inadequate discharge point.
- D4 Minor culverts undersized and poorly maintained.
- D5 Undersized detention facilities. Runoff discharges to ephemeral drainage through private property with inadequate conveyance infrastructure and no drainage easements.
- D6 Ephemeral drainageway destroyed by development. Inadequate conveyance infrastructure and discharge point.
- D7 High density commercial area with no stormwater detention and treatment facilities. Fragmented conveyances, no stormwater pipe system, unpaved roads have ponding and surface issues.
- D8 Fragmented conveyance infrastructure and inadequate discharge points for existing detention facilities.
- D9 Major ephemeral drainage culverts are filled with sediment and vegetation at inlets and outlets. One of the two major culverts under Highway 10 is buried.
- D10 Major culvert filled with sediment and appears to be undersized. HDPE culvert inlet and outlet exposed to UV degradation.
- D11 Ephemeral drainageway destroyed by development. Private culvert for large drainage area is half the size of upstream culvert under Highway 10 and significantly undersized.
- D12 No stormwater detention and treatment facilities in a dense commercial area near two major perennial drainages.
- D13 Inadequate discharge point for undeveloped lots.
- D14 Undersized culvert under railroad exacerbates flooding issues.
- D15 Major culvert under railroad is plugged/buried.

Infrastructure Needs

Broadband

The Federal Communications Commission (FCC) is in the process of updating the broadband speed definition to 100 Mbps download and 20 Mbps upload. Montana is ranked last among all states in BroadbandNow's ranking of high-speed internet availability (2023) with only 72.5% of people having access to 100Mbps broadband. In Missoula County, 88.1% of people have access to 100Mbps broadband. In Figure 24, areas that have access to broadband (1000 Mbps or greater) are shown in green and those areas lacking broadband access are shown in pink. Much of the area within the Wye that is undeserved by broadband lies within areas that are undeveloped and lacking transportation networks along which communication lines are typically installed.

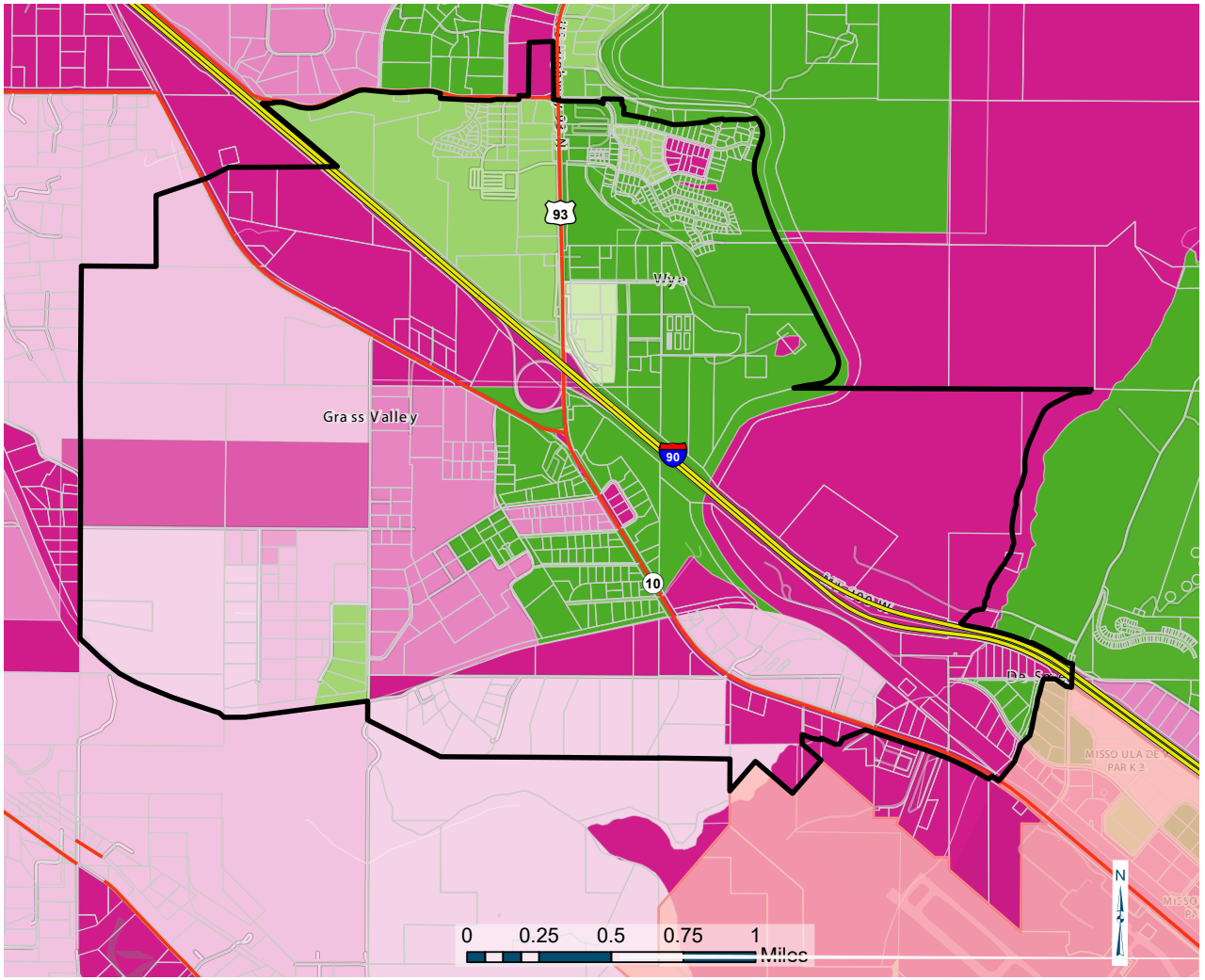


Figure 24. Underserved Broadband Areas

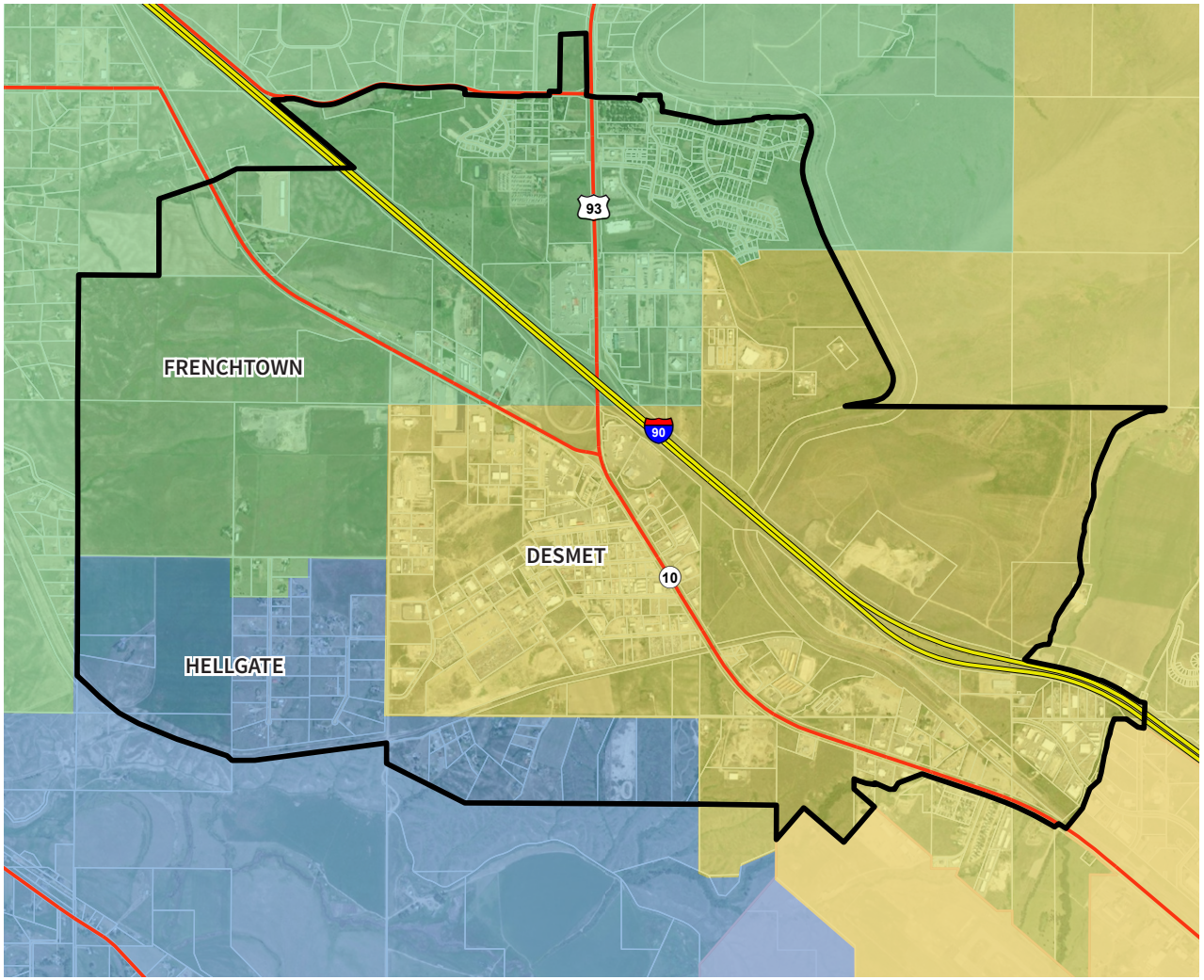


Figure 25. School Districts

WIP Boundary
DeSmet School District
Frenchtown School District
Hellgate School District

The planned residential development at the Wye will require school facilities and parks amenities to serve the area's residents and to attract residents to live and create businesses in this area of the County.

Increased population will require expansion of the existing school facilities and construction of new school facilities within the three West Valley School Districts: Frenchtown, a 100-student K-12 district; DeSmet, a 135-student K-8 district; and Hellgate Elementary, a 1500-student K-8 district. Increased population will also affect the high schools in the Missoula County Public School district as they serve Hellgate and DeSmet district high school students.

The three school districts within the WIP area provided their insights for this plan. Their input incorporated published guidelines such as Safe Routes Partnership and the EPA, and contextual factors within the plan area such as future population centers and opportunities for securing land. Best practices for school siting should consider published guidelines as well as input from the affected school districts.

Siting criteria for new park facilities is discussed later on in this plan.

Infrastructure Needs

Fire Protection

The Wye area is served by both the Missoula Rural Fire District (MRFD) and Frenchtown Rural Fire District (FRFD); each serving different regions within the study area, but with mutual aid agreements in place to respond to areas within each district's boundaries. Both MRFD and FRFD have stations located within the WIP area. MRFD Station #2, on Highway 10, covers eight square miles within the district's boundaries as well as a large portion of the industrial area near the airport due to agreements with the Missoula Fire Department. FRFD Station #7, located on Ladyslipper Lane, covers ~25 square miles within the district's boundaries.

MRFD Station #2 is staffed with a two-person crew and is not capable of adding staffing capacity under current codes, as the current living quarters are in code violation. Commencing an offensive fire attach requires four firefighters, resulting in increased response times from this station as they wait for a second unit. Response times from this station are adequate, averaging five minutes and six seconds, but can more than double waiting for additional staff and equipment to arrive on scene. The station averages 1.4 calls for service daily and has conducted an estimated 145 inspectable occupancies within the district's boundaries and WIP study area. The station has an Aerial Fire Truck (ladder truck), which is dispatched to every fire alarm, structure fire and gas smell within a building for the entire MRFD district, which spans ~84 square miles within Missoula County. It also has a Water Tender with 1800-gallon tank used for structure fires in rural areas where no fire hydrants are available as well as wildland fires, and a Ford F-550 used for wildland fires.

FRFD Station #7 is not currently staffed full time. The station has two resident firefighters who may be available when off duty from their regular rotation. Response times within FRFD is ~11 minutes, due to Station #7 being unstaffed, and thus, the majority of responses coming from Station #1 located 7 miles away in Frenchtown. FRFD averages 2 calls for service daily. The station has a Type-1 Fire Engine used to respond to structural fires as well as respond to emergency medical services, vehicle fires as well as other calls such as accidents, flooding and hazardous materials incidents. It also has a 1500-gallon Water Tender for rural structure fires and wildland fires, and Advanced Life Support Ambulance, a Type 35/6 Wildland Engine for wildland fires, and a Light Rescue/Air Vehicle which provides scene lighting and compressed air for large fire incidents, such as wildland fires.
Neither station is sufficiently staffed to meet current needs, nor does either station have the capacity to store and maintain additional equipment that would be required with growth in the WIP area. MRFD does not have additional space to add a Type-1 Fire Engine and staffing constraints only allow one piece of equipment to safely respond to an incident at a time. FRFD has satisfactory equipment to respond to most residential structure fires but lacks staffing to operate the equipment. It has no additional space to house equipment and anticipated growth would require and Aerial Fire Truck (ladder truck).

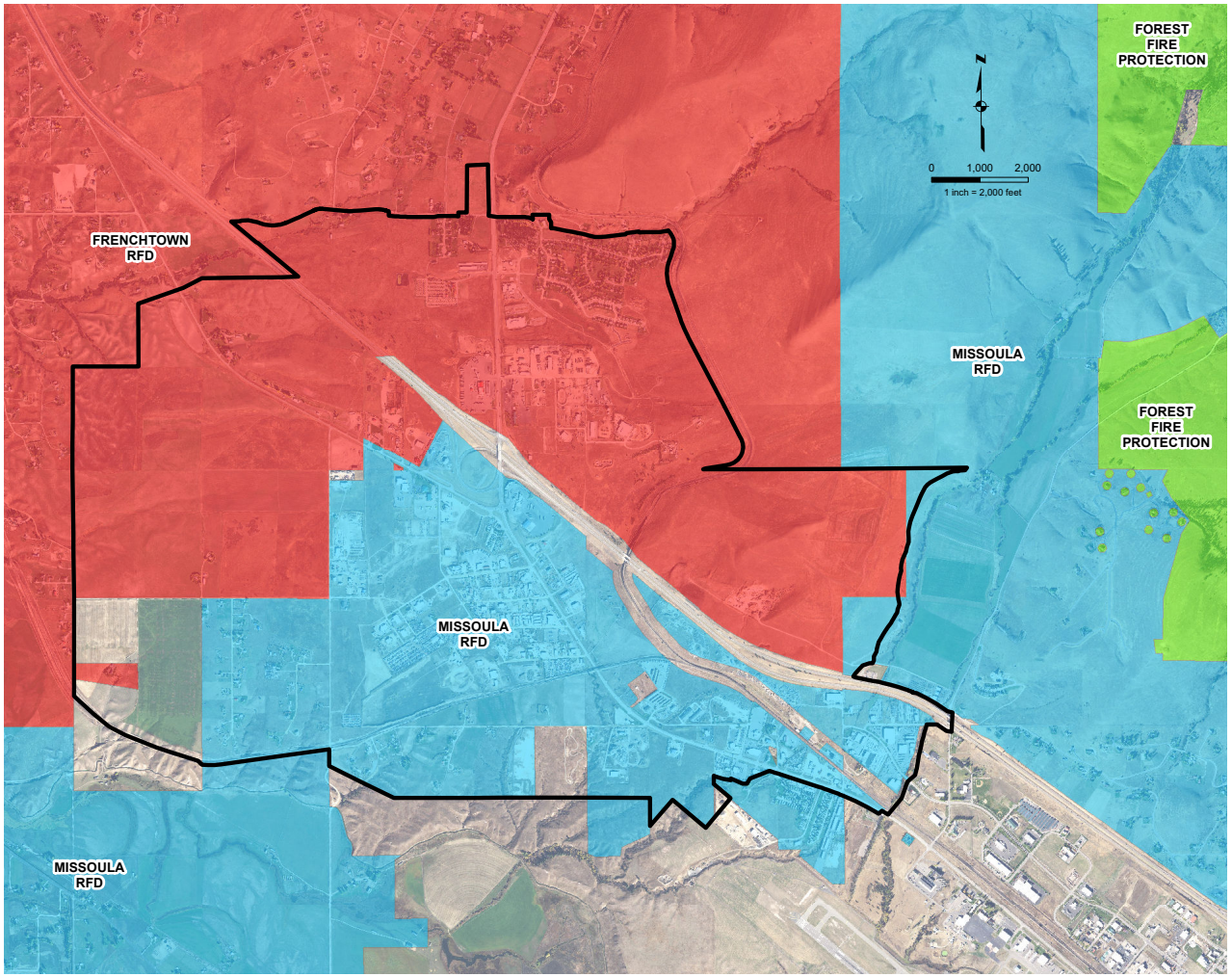


Figure 26. Fire Protection Districts

Infrastructure Plan

The Infrastructure Plan chapter builds upon the identified needs in the previous chapter, providing detailed recommendations to address the essential infrastructure requirements for the Wye area. This chapter presents a strategic framework for implementing infrastructure improvements that will support long-term urban development, improve connectivity, and enhance quality of life for residents. Each section outlines specific upgrades and expansions across key infrastructure categories—transportation, water and sewer, stormwater management, and community amenities like parks and schools. These recommendations aim to create a sustainable and resilient infrastructure system that meets current demands and anticipates future growth, positioning the Wye as a vital urban center for Missoula County.

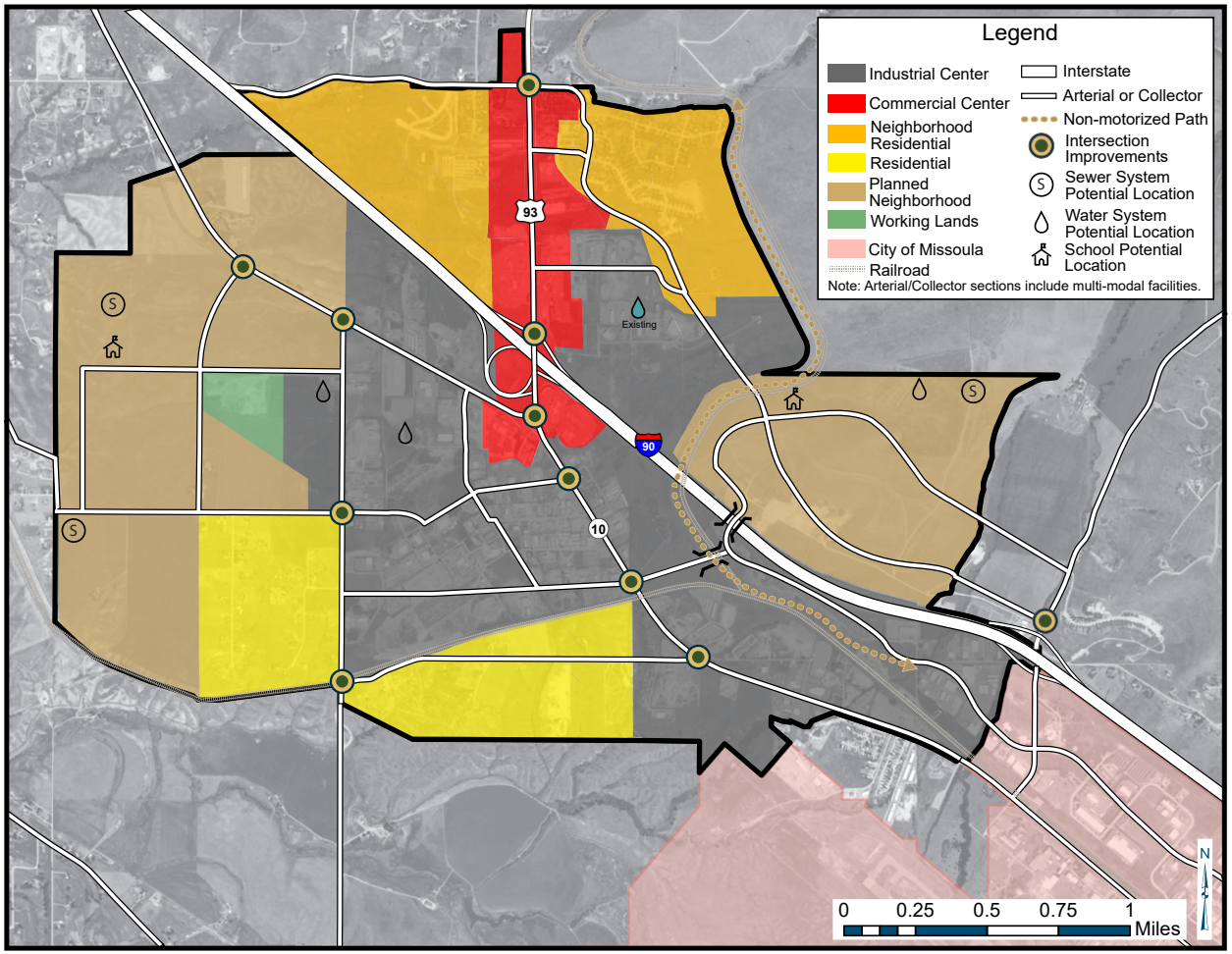


Figure 27. Overall Plan for Improvements

Infrastructure Plan
Transportation

The Wye area was historically built around industrial uses, large residential lots, and commercial development focused on access to Interstate 90 and/or Highway 93. This has resulted in the area being served by Highway 93, Interstate 90, and Highway 10 while many local streets remain gravel roads that do not accommodate multi-modal transportation. As identified in the Needs Assessment, these major transportation corridors, along with the railroad, act as barriers when trying to connect residential, industrial, and commercial uses. Many parcels are not connected to the road network and would benefit from an expanded collector road network that would help remove existing barriers and facilitate orderly development.

Functionally, the grid roadway network needs to consider the movement of various goods, services, pedestrians, bicycles, and vehicles while providing corridors for utilities such as water, wastewater, storm, and broadband. Many existing roadways set the stage for a well-connected grid roadway network but need improvement to accommodate all modes of travel. Building on and connecting the existing network, a proposed network of collector and arterial roadways have been identified to access existing parcels currently lacking connectivity to public roadways. Balancing the WIP area's need for industrial access with multi-modal connectivity, safety, and comfort will be critical to achieving the desired balance between residential, commercial, and industrial uses in the WIP area. Equally important are the streetscapes of these roads, to serve as placemaking. Streetscape recommendations for the planned grid roadway network have been coordinated with adjacent uses and designed with a Complete Street approach that balances the Wye's need to move goods and services with the safety and convenience of all roadway users.

Traffic Modeling

Substantial increase in allowable residential units in the WIP area, from the previous cap of 1,200 units up to 15,000 units, necessitates significant enhancements to the current transportation network to accommodate the resultant daily trips that will include residential, industrial, and commercial commuting patterns.

A traffic modeling analysis was conducted to accommodate the projected development of 10,000 to 15,000 new homes. Using Traffic Analysis Zones (TAZ), the analysis generated detailed predictions of trip generation and distribution based on proposed developments, historical traffic impact studies (TIS), and engineering judgment. It included existing traffic counts and TIS data (based on 2018 volumes from the MPO model) to analyze travel directions and the effects of the anticipated developments. The modeling predicted an increase of 90,000 to 135,000 daily trips across the greater Wye area at full build-out. These predictions help in planning the necessary infrastructure improvements at more localized levels, ensuring that each area within the Wye is adequately serviced.

Infrastructure Plan
Transportation

Promoting 15-Minute Communities
Our modeling focuses on reducing single-occupancy vehicle trips by promoting "15-minute communities." These neighborhoods are designed so residents can meet most daily needs—like shops, schools, parks, and healthcare—within a 15-minute walk or bike ride.

By placing essential services close together, we can significantly lower the need for long-distance travel. This not only encourages healthier lifestyles but also helps reduce traffic congestion and environmental impacts, enhancing overall quality of life.

Transportation Infrastructure
To support 15-minute communities, the WIP area's transportation system must prioritize safety, accessibility, and convenience for non-motorized forms of mobility. Key elements include:

Sidewalks and Bike Lanes: A safe and well-maintained network of pathways that accommodate users of all ages and abilities is crucial. These should accommodate users of all ages and abilities. Features like reduced speed limits and pedestrian-priority zones make walking and biking more appealing.

Public Transit: Public transit plays a pivotal role in the success of 15-minute communities, especially in larger areas where not everything can be within walking or biking distance. Efficient public transit options should be conveniently located with frequent service. This integration of transit solutions helps bridge the gap between different zones of a 15-minute community and provides a reliable alternative to driving, significantly reducing the dependence on private vehicles and contributing to environmental sustainability.

The modeling suggests that the right mix of urban design and modal choices can reduce vehicular trips by 25%. This reduction is essential for keeping traffic manageable and ensuring the transportation network can handle peak demands effectively. Reduction in vehicular trips directly reduces tailpipe emissions, mitigating climate change. Based on the traffic modeling and the goal of creating 15-minute communities, two overarching needs were identified: 1) increased capacity and 2) provision of a network of non-motorized facilities.

Increased Capacity
A dramatic increase in residential units correlates to a need to move a greater number of vehicles, thus a need to increase vehicle capacity. This can be achieved in several ways. The throughput of streets can be expanded, i.e. additional lanes can be added to existing roadways. The capacity of intersections can be raised. New streets can be constructed to expand the network.

Expanded Capacity at an Intersection: Roundabout vs. Signal Installation
When addressing the capacity of an intersection, both roundabouts and signal installations provide distinct advantages and challenges. Expanding the capacity of an intersection is crucial for improving traffic flow, reducing congestion, and enhancing safety. While the WIP provides an overview of the benefits and drawbacks of both roundabouts and traffic signals for expanding intersection capacity (see the Transportation Memorandum in Appendix A), it is important to note that a comprehensive Intersection Control Evaluation (ICE) should be conducted before deciding on the installation of any facility.

Non-Motorized Facilities

Complete Streets: Complete Streets is a design philosophy that prioritizes safe, accessible, and convenient transportation for all users, regardless of their mode of travel, age, or ability. This approach advocates for the transformation of streets into multi-functional public spaces that accommodate pedestrians, cyclists, public transit users, and motorists alike.

Key principles of Complete Streets:

- Accessibility for All Ages and Abilities
- Multimodal Integration
- Safety as a Priority
- Context-Sensitive Design
- Equity

A key objective of Complete Streets is to support a mode shift - encouraging people to transition from reliance on personal automobiles to more sustainable modes of transportation like walking, cycling, and public transit. Complete Streets contribute to this shift through:

- Increased Safety and Comfort
- Enhanced Connectivity
- Promoting Active Transportation
- Supporting Public Transit
- Encouraging Vibrant Public Spaces
- Environmental Benefits

Inclusion of effective drainage and stormwater treatment systems are also important elements of Complete Streets. Where Complete Streets are recommended within the WIP, it includes the assumption that drainage and stormwater treatment systems are included or improved. Incorporation of green

stormwater infrastructure, such as rain gardens, bioswales, and small scale bioretention basins create appealing open space and functionally serve to reduce “end-of-pipe” treatment systems like traditional detention ponds.

Park-and-Ride Facilities

As the Wye area continues to expand in size and density, the addition of a park-and-ride facility becomes increasingly valuable. A park-and-ride system allows residents and commuters to park their vehicles in a designated area and transfer to public transportation or ride share programs for the remainder of their journey. This setup is especially useful in reducing traffic congestion and minimizing the environmental impact of single-occupancy vehicle trips.

By offering a convenient transfer point between personal vehicles and public transportation, a park-and-ride facility helps reduce external trips to Missoula. Residents from the Wye area will likely commute to Missoula for work, school, or other activities, and a well-placed park-and-ride can significantly reduce the number of vehicles entering Missoula’s core. This reduces traffic congestion on major corridors such as Interstate 90 and Highway 93 and mitigates parking challenges within the city. Additionally, fewer cars on the road contribute to reduced greenhouse gas emissions, supporting the County’s sustainability goals.

The park-and-ride system also encourages the use of public transit by making it easier for residents to access buses or other transit options. As public transportation networks like Mountain Line continue to expand and adapt to serve the growing Wye area, having a central location where commuters can leave their vehicles will make transit a more viable and attractive option. This not only supports the goal of reducing external trips but also enhances the overall mobility of the Wye Area by integrating it into the larger Missoula transportation system. As a result, the park-and-ride becomes a critical component of long-term transportation planning for the Wye area as it evolves into a more densely populated community.

Figure 28. Park-and-ride at the southwest corner of the intersection at US 93 and I-90

Figure 29. Park-and-ride at the northwest corner of the intersection at US 93 and I-90

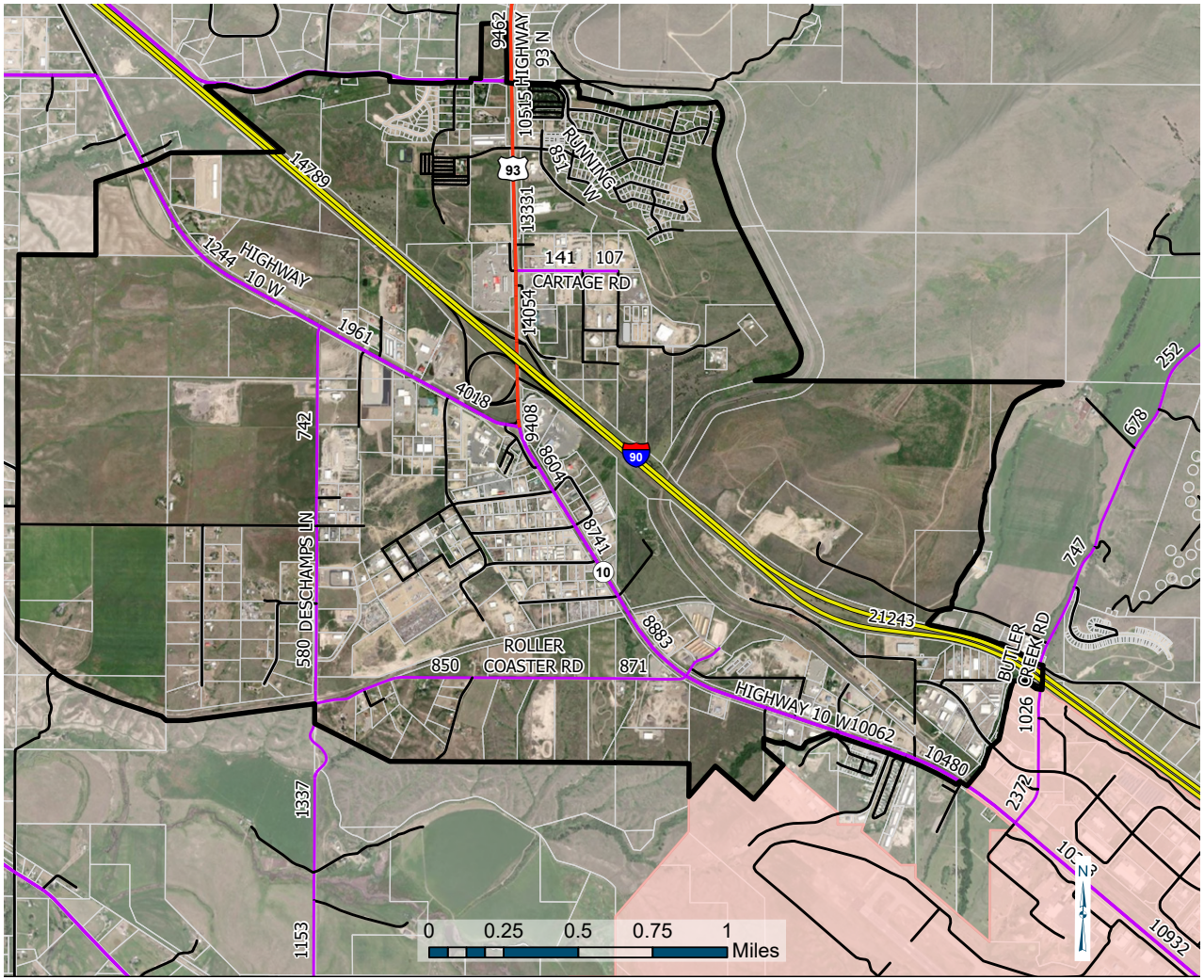


Figure 30. Existing Traffic Volumes

- Interstate
- Highway
- Collector Road
- Local Road
- Infrastructure Planning Study Area
- Incorporated Cities and Towns
- Property Lines
- 742 Average Daily Traffic

Transportation Recommendations

The recommended improvements to the transportation roadway network in the sections that follow are key to connecting and transitioning existing land uses with future growth. The following factors have been considered in the roadway network recommendations:

- Proposed land uses and land use transition areas
- Proposed district or subareas based on land uses, circulation, and access
- Areas of higher and lower density uses
- Areas of industrial, commercial, and residential uses
- An open space network including parks, greenways, and buffer areas
- A primary, multi-modal circulation network including bicycle, pedestrian, and transit, while considering park and ride locations and access to existing and planned industrial uses
- Special nodes, corridors, or other features such as viewsheds
- Potential to improve the regional storm drainage system

Transportation recommendations were developed based on the needs identified for the area with a focus on creating 15-minute communities. These recommendations fall into three categories:

- Street improvements
- Intersection improvements
- Non-motorized improvements

Infrastructure Plan
Transportation

Typical Sections

As density increases in the Wye area, it is crucial to account for non-motorized travel. Each typical section in this report were analyzed for the comfort of users of all ages and abilities using National Association of City Transportation Officials (NACTO) guidance. The concept of utilizing a shared use path for non-motorized travel or the combination of a sidewalk and protected bike lane should be evaluated against the number of driveway approaches and vehicular volumes across the facility. Directional cycle tracks are preferred where there are frequent driveways, since they align with traffic expectations and allow for clearer intersection treatments. NACTO suggests the use of a protected bike lane in combination with a sidewalk when both bicycle and pedestrian volumes are high. This is to be expected as density increases with compatible land uses.

Typical sections developed for the improvements in this Plan generally follow three-lane county sections. Highway 93 and Broadway Street follow a five-lane section. Highway 10 follows a three-lane section with MDT design widths.

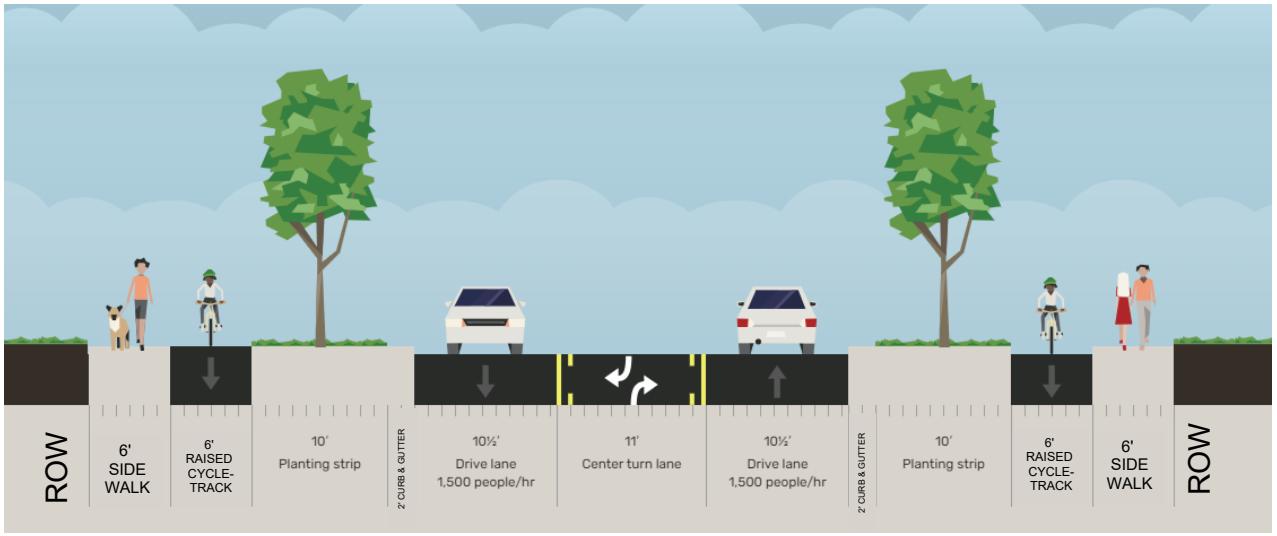


Figure 31. Internal Multi-Modal Street Typical

Note: Planting strip buffer curb height, to be used for snow storage, roadway lighting, and stormwater facilities (i.e. rain gardens)

Internal Multi-Modal Street Typical

This typical section is most suitable adjacent to high density developments with varied land uses. Recommended for Moccasin Lane, and New Collectors A, B, E, and F (Figures 37 and 40). This section fully separates all modes of travel, while accommodating increased traffic and turning movements. Wide boulevards provide comfort for non-motorized users and provide space for green storm drain solutions like rain gardens and/or bio retention. Trees planted in the median will provide shade and help with traffic calming by providing side friction. Turn lanes should be analyzed on a case-by-case basis to determine if they are needed continuously or only at selected locations such as major generators and intersections.

Multi-Modal Collector Street Typical

This typical section is most suitable for travel between neighborhoods where pedestrian traffic is expected to be lower. It is recommended for Deschamps Lane, Roller Coaster Road, Enterprise Way, and New Collectors C, D, F, G, and H. This section separates non-motorized users from vehicular travel, while accommodating increased traffic and turning movements. Wide boulevards provide comfort for non-motorized users, and provide space for green storm drain solutions such as rain gardens and/or bio retention. Trees planted in the median will provide shade and help with traffic calming by providing side friction. Turn lanes are expected only at select locations such as major generators and intersections.

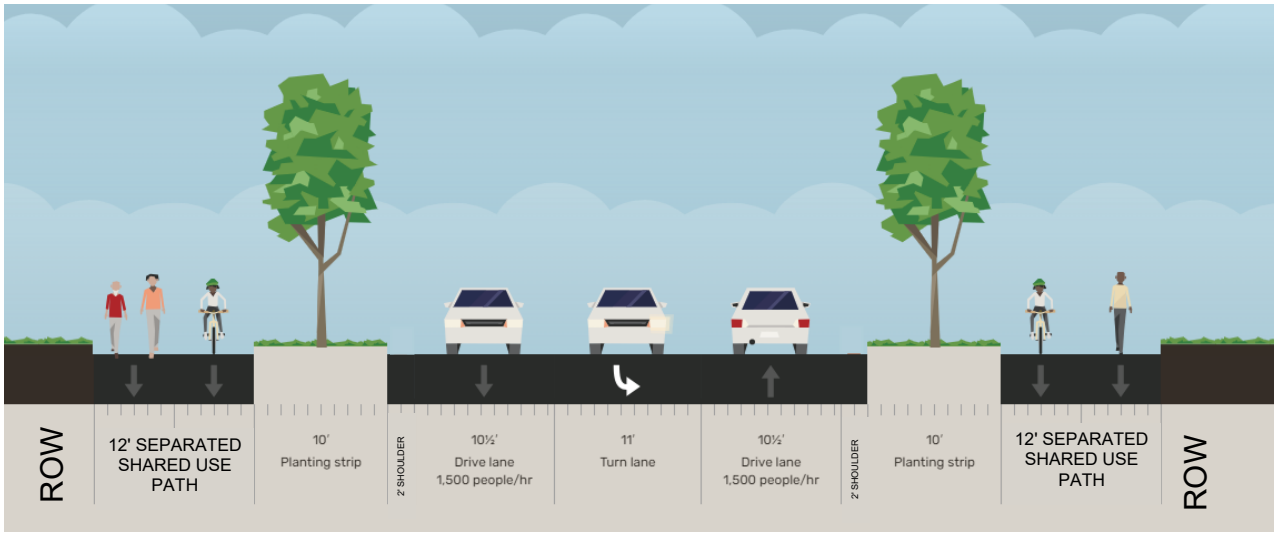


Figure 32. Multi-Modal Collector Street Typical

Note: Planting strip buffer not curb height as shown, to be used for snow storage, roadway lighting, and stormwater facilities (i.e. rain gardens). Where sidewalks exist along Butler Creek Road, consider widening to accommodate bicycle travel as well.

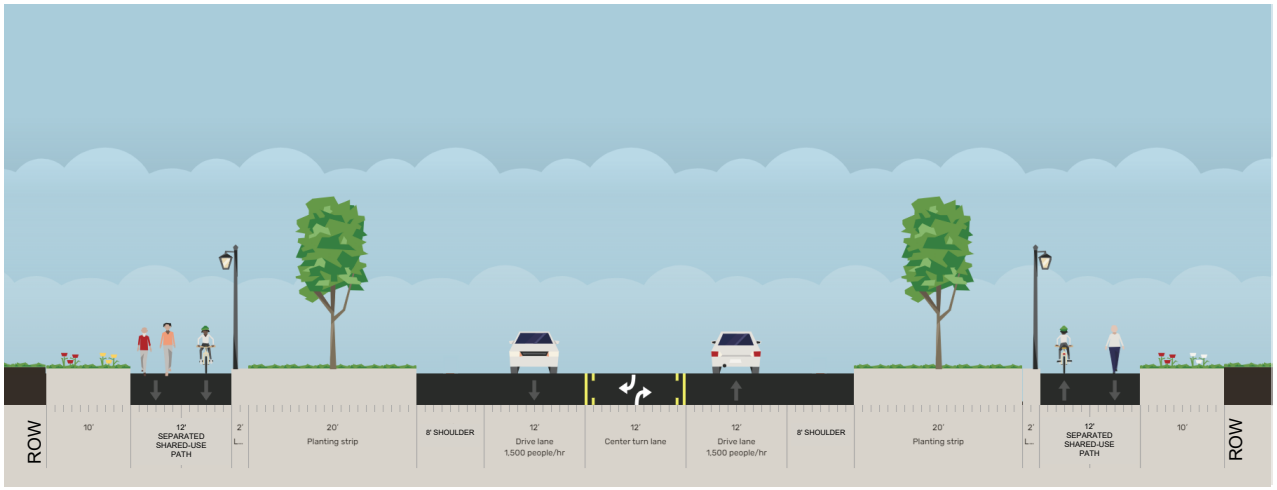


Figure 33. MDT Multi-Modal Collector Street Typical

Note: Planting strip buffer proposed at road grade (not curbed as shown), to be used for snow storage, roadway lighting, and stormwater facilities (i.e. rain gardens). Actual ROW width unknown, assumed 140 feet.

MDT Multi-Modal Collector Street Typical

This typical section is targeted for situations similar to the County Multi-Modal Collector Street Typical sections. However, this typical utilizes MDT standard widths and construction materials. Factors associated with MDT construction include wider shoulders and boulevards to meet MDT standards and the wider right-of-way for Highway 10, which is where this typical section is recommended. Designs should be coordinated with MDT to implement more urban standards facilitating lower operating speeds.

This section separates non-motorized users from vehicular travel, while accommodating increased traffic and turning movements. Wide boulevards provide comfort for non-motorized users and provide space for green storm drain solutions such as rain gardens and/or bio retention. Trees planted in the median will provide shade and help with traffic calming by providing side friction. Turn lanes are expected only at select locations such as major generators and intersections.

Infrastructure Plan
Transportation

Corridor Street Typical

This typical is most suitable for high volume streets nearing arterial traffic volumes. It is recommended for West Broadway Street. This typical is proposed as a five-lane section but could be reduced to three lanes for standard vehicular travel and dedicating the outside lanes to efficient bus service thereby offering a critical component of a bus rapid transit system (BRT). Implementing BRT would reduce headways, generally defined as the amount of time between transit vehicle arrivals at a stop, and offer significant opportunity for expanding capacity on a person-basis rather than a vehicle-basis. This shift in infrastructure allocation aligns well with other local mode share goals and requires significant collaboration between Missoula County, MPO, and MUTD to expand this level of transit service to the Wye area.

In addition to the potential for BRT, this section fully separates all modes of travel, while accommodating increased traffic and turning movements. Wide boulevards provide comfort for non-motorized users, and provide space for green storm drain solutions such as rain gardens and/or bio retention. Trees planted in the medians will provide shade and help with traffic calming by providing side friction. Continuous turn lanes should be considered based on access density and current speeds. If speeds were lowered in combination with the correct land use, then intermittent turn lanes could be explored.

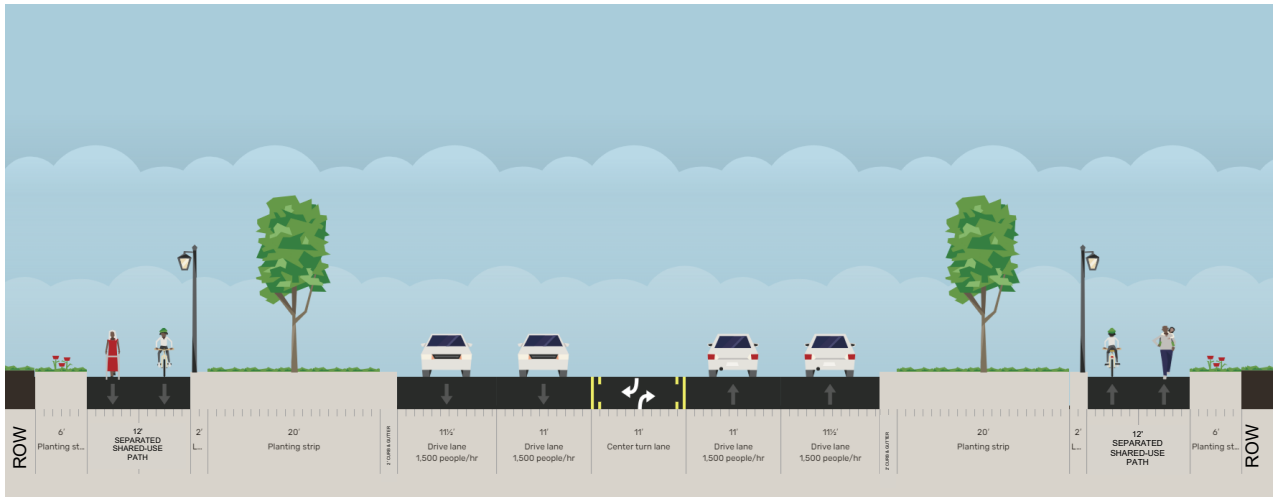


Figure 34. Corridor Street Typical

Note: Planting strip buffer proposed at road grade (not curbed as shown), to be used for snow storage, roadway lighting, and stormwater facilities (i.e. rain gardens). Approximately 32.5 feet of ROW required southeast of Training Drive for this typical section on Highway 10/ West Broadway. Additional ROW needed is assumed to be required as part of development agreements. Outside travel lane includes 0.5 foot shoulder to maintain 2-ft offset from face of curb.

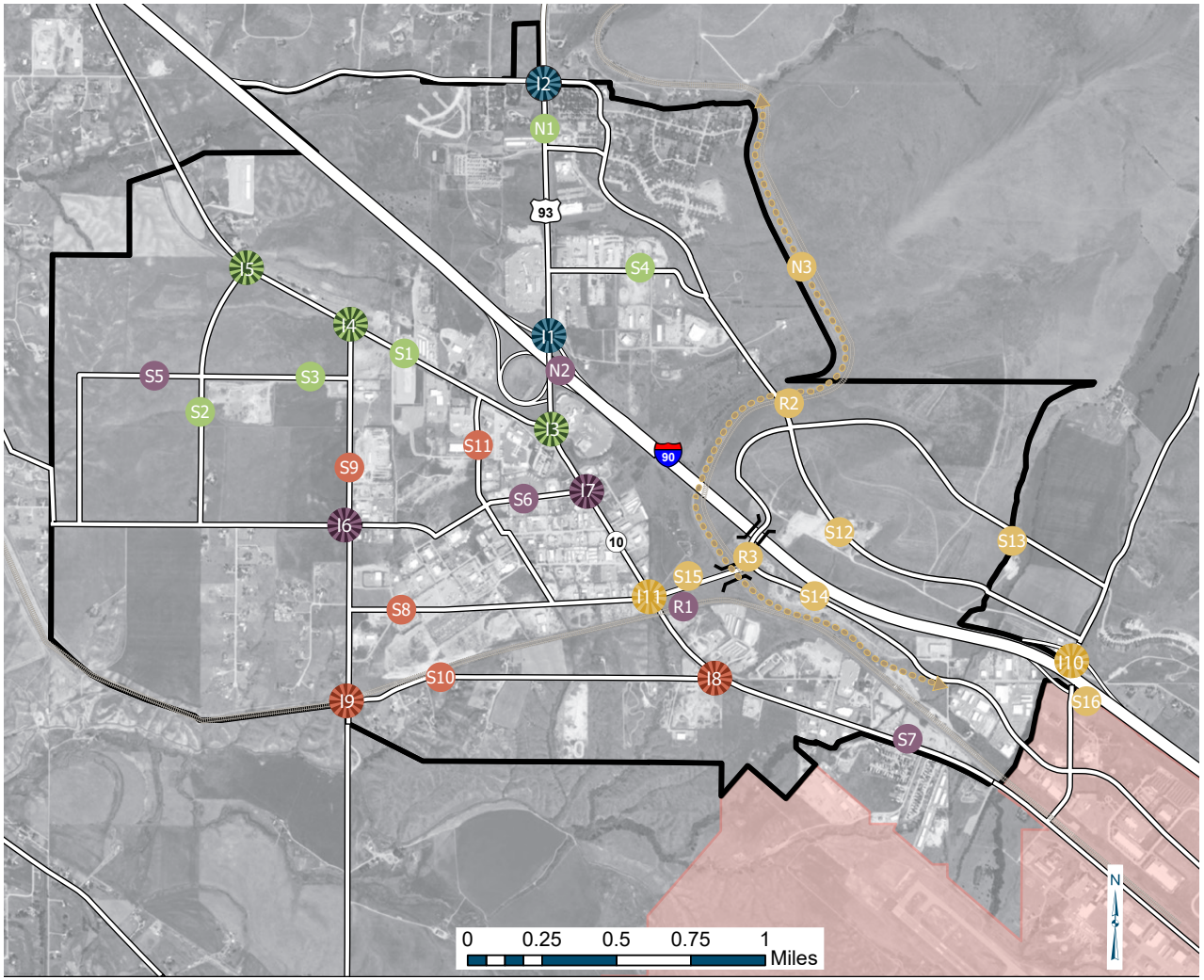


Figure 35. Phased Improvements

The transportation recommendations have been classified into five phases:

Phase 0 Catalyst and Precedent Infrastructure
Phase 1 Extend Core Infrastructure and Address Constraints
Phase 2 Infrastructure Expansion for Urban Development
Phase 3 Expand Urban Scale Infrastructure
Phase 4 Expand Urban Infrastructure to Butler Creek and Edges

Legend

- Infrastructure Plan Study Area
- Phase 0
- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Incorporated Cities and Towns
- Interstate
- Arterial or Collector
- Railroad
- Non-Motorized Path

Note: Arterial/Collector sections include multi-modal facilities

Infrastructure Plan
Transportation

Phase	Description	Projects	Public Costs
Phase 0: Catalyst & Precedent Infrastructure	Focus on essential infrastructure needs such as intersection improvements	I1, I2	$3M - $4M
Phase 1: Extend Core Infrastructure and Address Constraints	Widen and add Complete Streets, improve intersections, non-motorized improvements	S1, S2, S3, S4, I3, I4, I5, N1	$29M - $30M
Phase 2: Infrastructure Expansion for Urban Development	Extend and widen collector streets, intersection improvements, non-motorized improvements	S5, S6, S7, R1, I6, I7, N2	$16.8M - $17.8M
Phase 3: Expand Urban Scale Infrastructure	Upgrades to and new complete streets, intersection improvements	S8, S9, S10, S11, I87, I9	$33.1M - $34.1M
Phase 4: Extend Urban Infrastructure to Butler Creek and Edges	New Complete Streets, new interchange, intersection improvements, non-motorized improvements	S12, R2, S13, S14, S15, R3, S16, I10, I11, N3	$83.6M - $86.1M
		Total	$165.5M - $172M

Table 5. Summary of Transportation improvements

Recommended transportation improvements for each phase are listed in Table 5, above. The following pages include detailed descriptions of each improvement and identification on Figures 36-40. Improvements to MDT roads/intersections require MDT coordination and approvals. Speed limit change recommendations will require a speed study and approval by the State of Montana Transportation Commission.

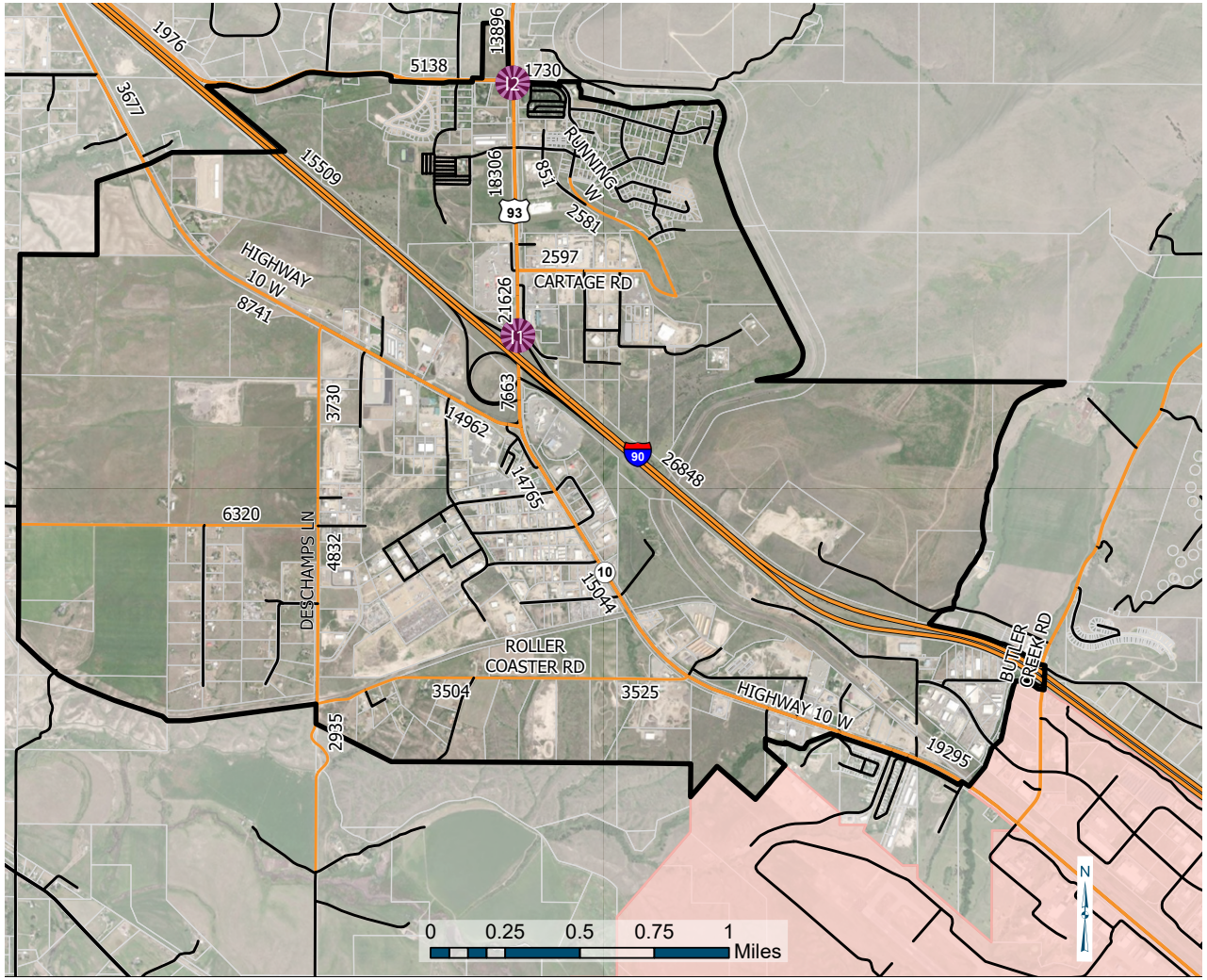


Figure 36. Phase 0 Transportation Improvements

Recommended Improvements in Phase 0: Catalyst and Precedent Infrastructure

The first phase focuses on essential infrastructure needs with the goal of facilitating meaningful development. It is guided by current development patterns, recent development trends, and opportunities. This phase will address major limitations by building foundational elements that are of regional importance.

Legend

- Existing Road
- Local Road
- Phased Improvements to Existing Road
- Phased New Road Construction
- Previously Constructed Road
- Phased New Shared-Use Path Construction
- Addition of Non-Motorized Facilities to Existing Road
- Incorporated Cities and Towns
- Property Lines
- Infrastructure Planning Study Area
- Improved Intersection
- 742 Average Daily Traffic

Infrastructure Plan
Transportation

The Highway 93 and I-90 Westbound Off-Ramp intersection is in need of improvement in the early stages of this Plan. Coordination with MDT will be essential to identify funding sources. An Intersection Control Evaluation (ICE) should be performed at this location to determine the appropriate intersection form - such as a roundabout, signal, or other configuration; and to assess eligibility for state-administered programs such as the Highway Safety Improvement Program (HSIP) or Congestion Mitigation and Air Quality (CMAQ) funds. Additional options may include the Surface Transportation Block Grant (STBG) program through MDT's Primary or Urban allocations, or state-funded safety or operational improvements. State-only funds could also serve as a local match for future federal discretionary grants such as RAISE or Safe Streets and Roads for All (SS4A), helping advance early intersection improvements.

INTERSECTION IMPROVEMENTS

I1 **Highway 93 and I-90 Westbound Offramp**
Traffic signal or two-lane roundabout. Estimated cost: $2M - $3M

I2 **Highway 93 and Waldo Lane**
Traffic signal. Estimated cost: $1M

Traffic Signal or roundabout at I-90 westbound ramp and Hwy 93

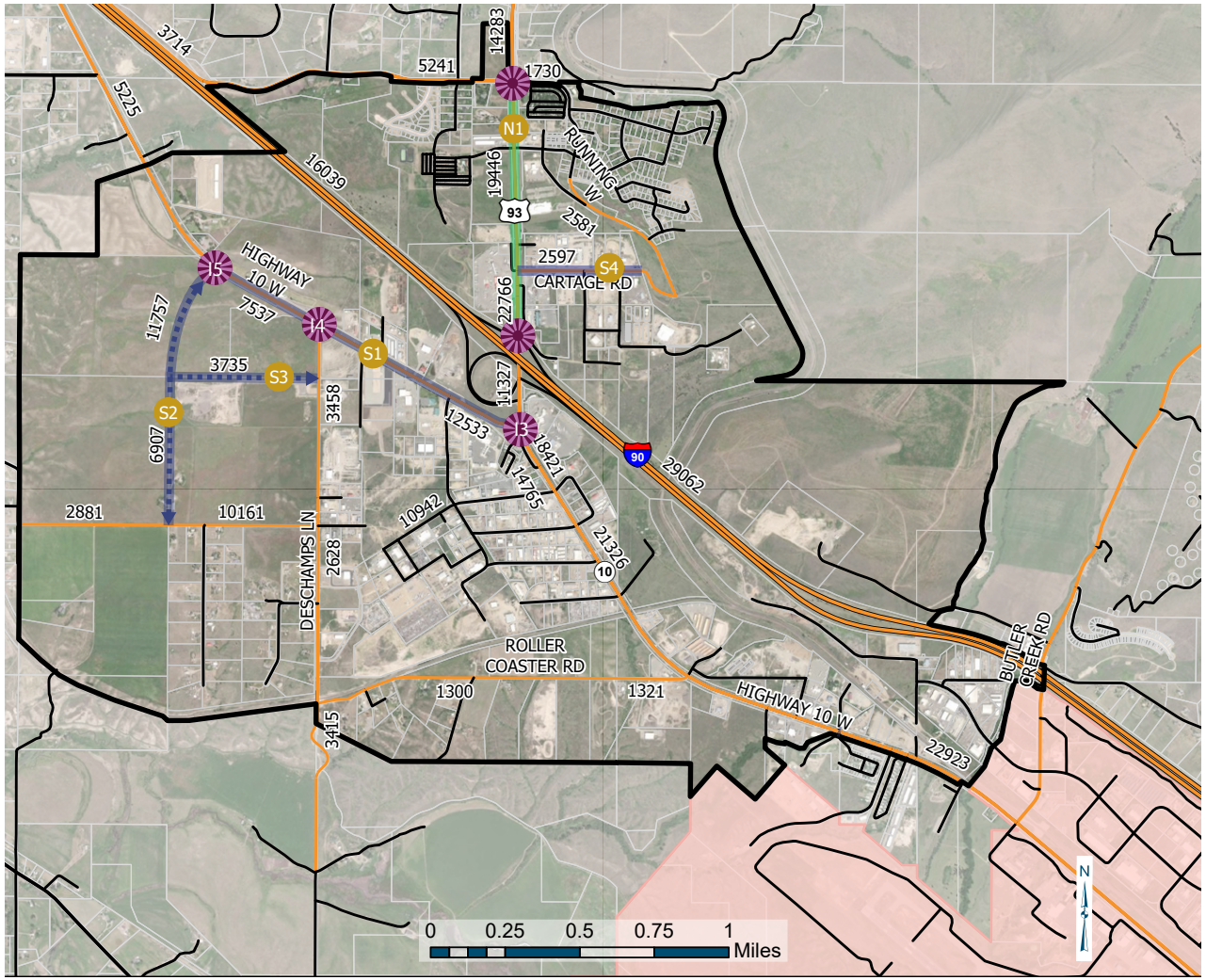


Figure 37. Phase 1 Transportation Improvements

Recommended Improvements in Phase 1: Extend Core Infrastructure and Address Constraints

This phase will expand upon foundational elements in an incremental way. It will address the transportation grid and major intersection improvements.

Legend

- Existing Road
- Local Road
- Phased Improvements to Existing Road
- Phased New Road Construction
- Previously Constructed Road
- Phased New Shared-Use Path Construction
- Addition of Non-Motorized Facilities to Existing Road
- Incorporated Cities and Towns
- Property Lines
- Infrastructure Planning Study Area
- Improved Intersection
- N1 Road/Path Improvement
- 742 Average Daily Traffic

Infrastructure Plan
Transportation

STREET IMPROVEMENTS

S1 **Highway 10**
Widen Highway 10 from future New Collector A to the intersection with Highway 93, including turn lanes, shoulders, drainage improvements, and non-motorized facilities. Estimated cost: $8.7M (MDT multi-modal collector street typical section)

S2 **New Collector A**
Add new Complete Street connection from Highway 10 to Moccasin Lane. Estimated cost: $7M (Internal multi-modal street or multi-modal collector street typical section)

S3 **New Collector B**
Add new Complete street connection from Deschamps Lane to New Collector A. Estimated cost: $3.9M (Internal multi-modal street or multi-modal collector street typical section)

S4 **Cartage Road Improvements**
Upgrade to Complete Street and improve road drainage systems from Highway 93 to the S curve at Running W subdivision. Estimated cost: $3M (Internal multi-modal street or multi-modal collector street typical section)

INTERSECTION IMPROVEMENTS

I3 **Highway 10/Broadway and Highway 93**
Improved signalized intersection or two-lane roundabout. Estimated cost: $2M - $3M

I4 **Highway 10 and Deschamps Lane**
Multilane all-way stop, traffic signal, or roundabout. Estimated cost: $1.5M

I5 **Highway 10 and Collector A**
Traffic signal or two-lane roundabout. Estimated cost: $1.5M

NON-MOTORIZED IMPROVEMENTS

N1 **Highway 93 Shared Use Path A**
Add shared use path from westbound interstate ramps to Waldo Road. Estimated cost: $1.4M

Improve intersection at Highway 10 and Deschamps Lane

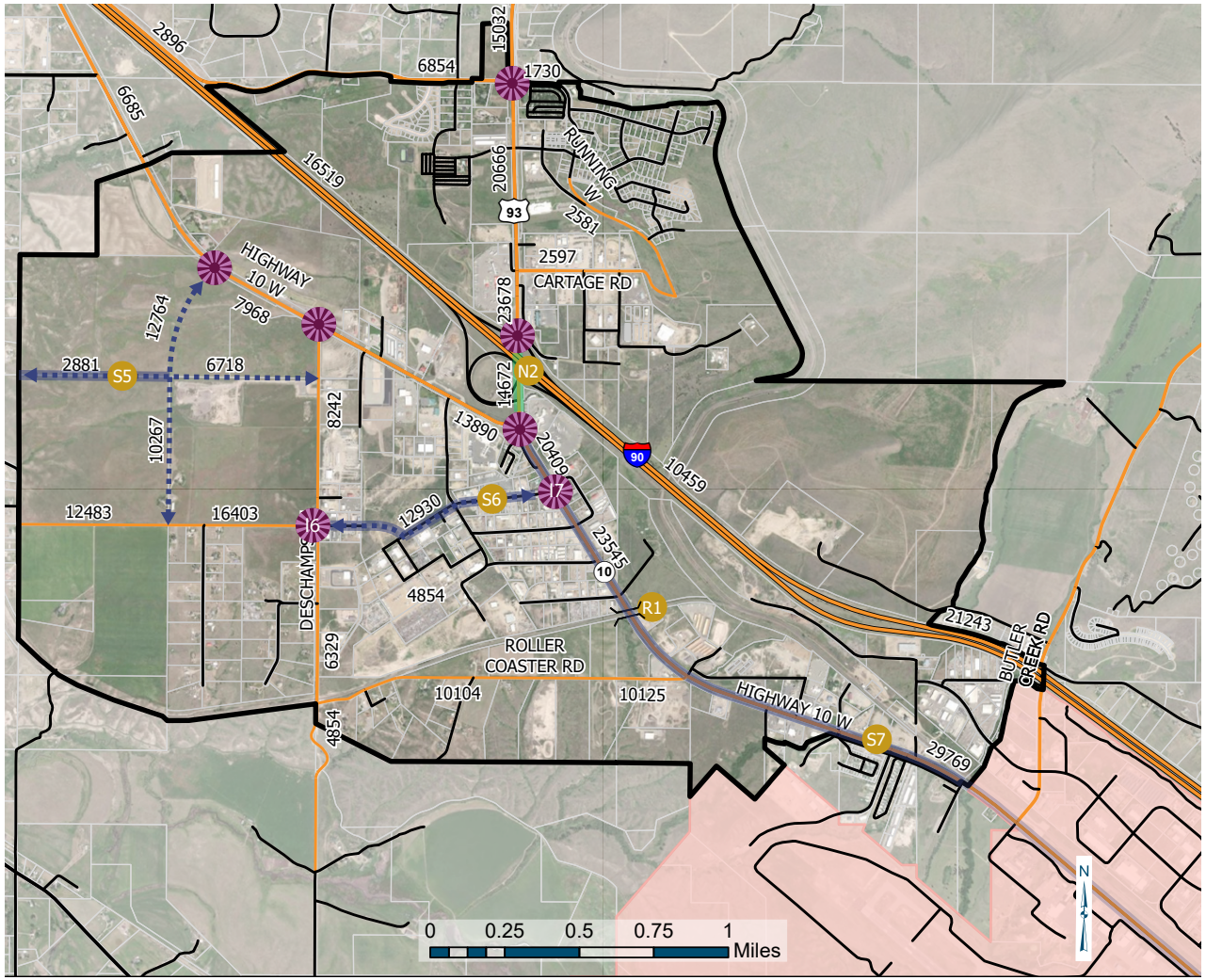


Figure 38. Phase 2 Transportation Improvements

Recommended Improvements in Phase 2: Infrastructure Expansion for Urban Development

This phase will build upon foundational elements while considering localized improvements, enhancing the transportation grid and continuing to focus on critical intersection improvements.

Legend

- Existing Road
- Local Road
- Phased Improvements to Existing Road
- Phased New Road Construction
- Previously Constructed Road
- Phased New Shared-Use Path Construction
- Addition of Non-Motorized Facilities to Existing Road
- Incorporated Cities and Towns
- Property Lines
- Infrastructure Planning Study Area
- Improved Intersection
- N1 Road/Path Improvement
- 742 Average Daily Traffic

Infrastructure Plan
Transportation

STREET IMPROVEMENTS

S5 **Extend Collector B**
Extend New Collector B to the west. Estimated cost: $3.9M (Internal multi-modal street or multi-modal collector street typical section)

S6 **Enterprise Way Improvements**
Widen and extend Enterprise Way from Deschamps Lane to Broadway. This road corridor is also critical for storm drainage conveyance improvements. Estimated cost: $6.5M (Internal multi-modal street or multi-modal collector street typical section)

S7 R1 **Broadway Street Improvements**
Widen Broadway from Highway 10 to the airport with drainage improvements. This project would include reconstructing the BNSF bridge to provide added width for additional lanes and non-motorized facilities. Estimated cost: $50M (includes $18M for BNSF bridge) (Corridor street typical section)

INTERSECTION IMPROVEMENTS

I6 **Deschamps Lane and Enterprise Way**
Multilane all-way stop or single lane roundabout. Estimated cost: $1.5M

I7 **Broadway and Enterprise Way**
Traffic signal or two-lane roundabout. Estimated cost: $2M - $3M

NON-MOTORIZED IMPROVEMENTS

N2 **Highway 93 Shared Use Path B**
Add a shared use path from westbound interstate ramps to Highway 10. This project should be implemented in conjunction with any bridge deck improvements for the bridge over the interstate as there isn't sufficient width for this improvement on the existing bridge. Estimated cost: $1.4M

Widen Broadway Street and reconstruct BNSF bridge

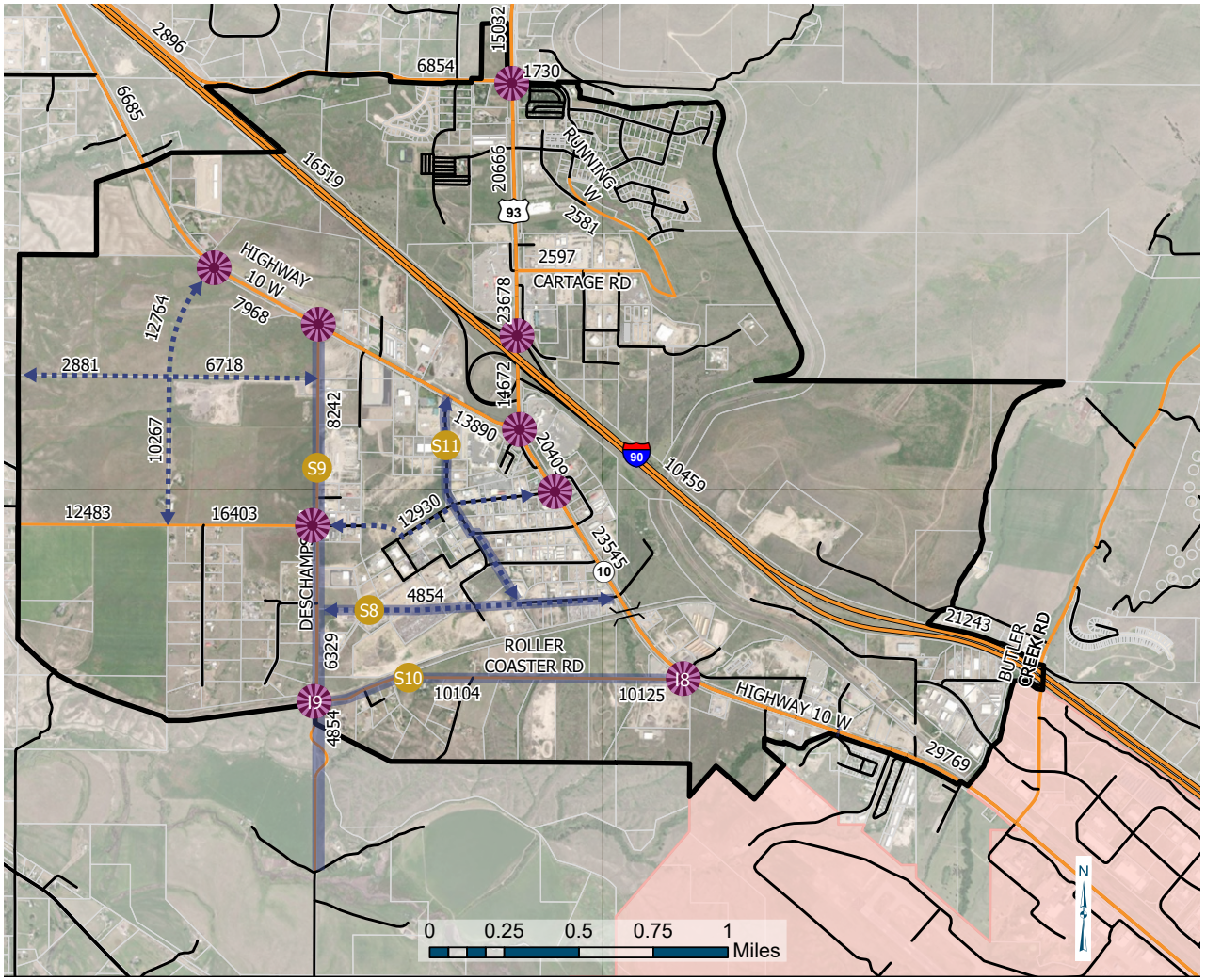


Figure 39. Phase 3 Transportation Improvements

Recommended Improvements in Phase 3: Expand Urban Scale Infrastructure

This phase continues expanding the transportation grid and improving key intersections.

Legend

- Existing Road
- Local Road
- Phased Improvements to Existing Road
- Phased New Road Construction
- Previously Constructed Road
- Phased New Shared-Use Path Construction
- Addition of Non-Motorized Facilities to Existing Road
- Incorporated Cities and Towns
- Property Lines
- Infrastructure Planning Study Area
- Improved Intersection
- N1 Road/Path Improvement
- 742 Average Daily Traffic

Infrastructure Plan
Transportation

STREET IMPROVEMENTS

S8: New Collector C
Add new east-west Complete Street connection from Broadway to Deschamps Lane. Estimated cost: $7.1M (Internal multi-modal street or multi-modal collector street typical section)

S9: Deschamps Lane Improvements
Upgrade to Complete Street from Roller Coaster Road to Highway 10. Estimated cost: $9.5M (Internal multi-modal street or multi-modal collector street typical section)

S10: Roller Coaster Road Improvements
Upgrade to Complete Street from Deschamps Lane to Highway 93. Estimated cost: $9.2M (Internal multi-modal street or multi-modal collector street typical section)

S11: New Collector D
Add new north-south Complete Street connection from Highway 10 to New Collector C. Estimated cost: $3.8M (Internal multi-modal street or multi-modal collector street typical section)

INTERSECTION IMPROVEMENTS

I8: Roller Coaster Road and Broadway
Traffic signal or two-lane roundabout. Estimated cost: $2M - $3M

Roller Coaster Road and Deschamps Lane
Traffic signal or two-lane roundabout. Estimated cost: $1.5M

Note: All Complete Street improvement recommendations include an opportunity to improve the storm drainage system and incorporate water quality treatment.

Upgrade Deschamps Lane to Complete Street

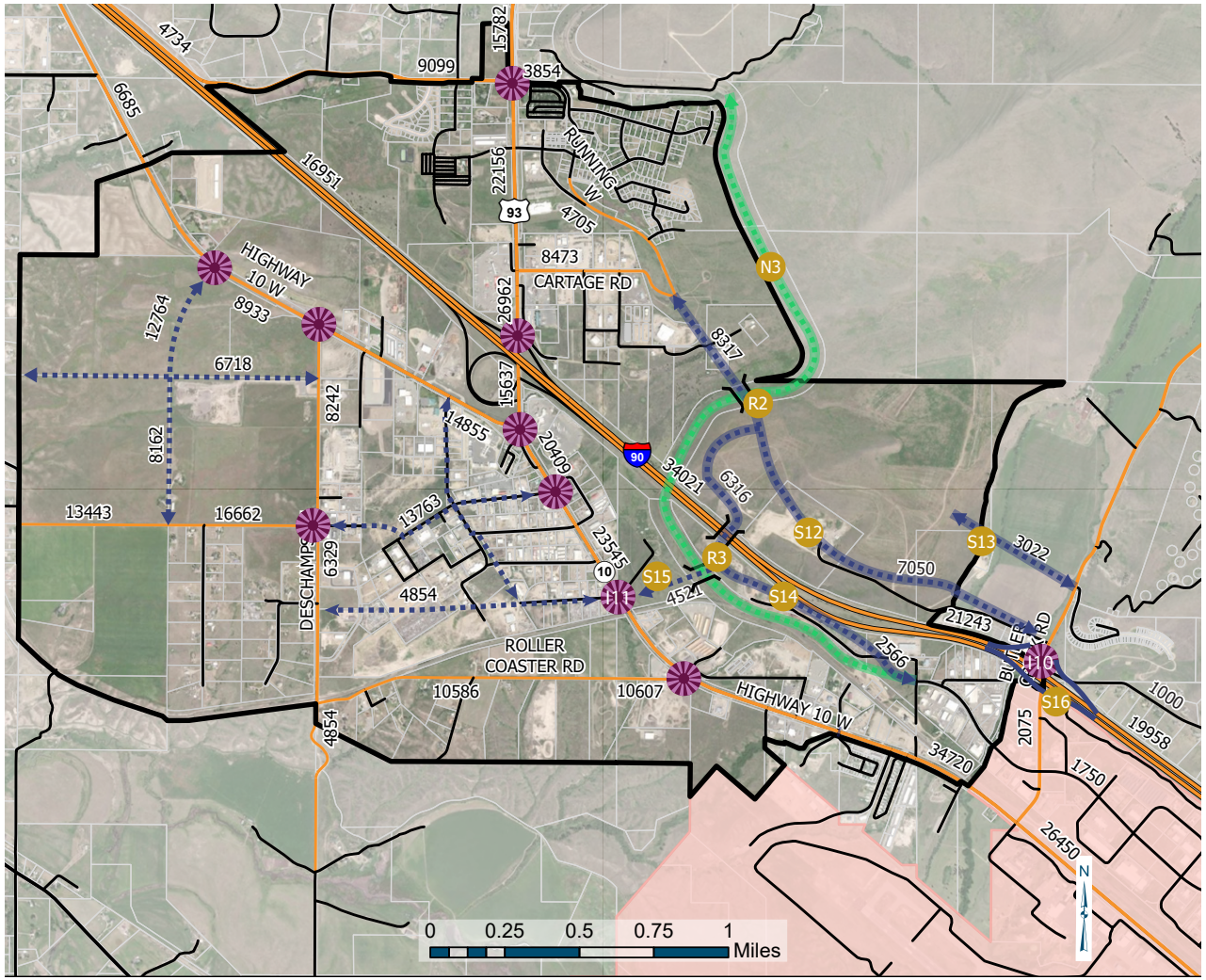


Figure 40. Phase 4 Transportation Improvements

Recommended Improvements in Phase 4: Extend Urban Infrastructure to Butler Creek and Edges

This phase addresses transportation challenges for the Butler Creek area and remaining undeveloped areas on the edges of the WIP area.

Legend

- Existing Road
- Local Road
- Phased Improvements to Existing Road
- Phased New Road Construction
- Previously Constructed Road
- Phased New Shared-Use Path Construction
- Addition of Non-Motorized Facilities to Existing Road
- Incorporated Cities and Towns
- Property Lines
- Infrastructure Planning Study Area
- Improved Intersection
- N1 Road/Path Improvement
- 742 Average Daily Traffic

Infrastructure Plan
Transportation

STREET IMPROVEMENTS

S12 R2 **New Collector E**
Add new Complete Street from Cartage Road to Butler Creek Road. This project would require a grade separated crossing of the BNSF Railroad. Estimated cost: $30M (Internal multi-modal street or multi-modal collector street typical section)

S13 **New Collector F**
Add new Complete Street connection west of Butler Creek Road. Estimated cost: $3.5M - $5M (Internal multi-modal street or multi-modal collector street typical section)

S14 **New Collector G**
Add new Complete Street from New Collector E to Expressway. This project would require a grade separated crossing of the I-90. This crossing is not proposed as an interchange. Estimated cost: $25M (Internal multi-modal street or multi-modal collector street typical section)

S15 R3 **New Collector H**
Add new Complete Street connection from New Collector G to Broadway. This project would require a grade separated crossing of the BNSF Railroad. Estimated cost: $17M (Internal multi-modal street or multi-modal collector street typical section)

S16 **New Interchange at Butler Creek Road**
Add new interchange at Butler Creek Road including new on and off ramps (requires right-of-way acquisition & relocation/acquisition of one business and one home)

INTERSECTION IMPROVEMENTS

I10 **Butler Creek Road and New Collector G**
Two-way stop or single-lane roundabout. Estimated cost: $1.5M

I11 **Broadway Street and New Collector H**
Traffic signal or two-lane roundabout. Estimated cost: $2M - $3M

NON-MOTORIZED IMPROVEMENTS

N3 **New Railroad Trail**
Add shared use path from Tucker Lane under I-90 to Expressway. Estimated cost: $4.6M

Note: All Complete Street improvement recommendations include an opportunity to improve the storm drainage system and incorporate water quality treatment.

Figure 41. Sub Area A1

Figure 42. Sub Area A2

Figure 43. Sub Area A4

A critical aspect of evaluating the Wye area for future development is determining how it will be served with water and sewer services for both existing needs and expanded development. Dense residential, commercial, and industrial development will require public-grade utilities to be developed to provide the level of reliability, environmental sustainability, and longevity that generally cannot be found in individual wells and septic systems. The master planning approach of infrastructure growth developed in this Infrastructure Plan aims to prevent ad-hoc development by evaluating alternatives.

Proper planning and foresight can help avoid many of the pitfalls and difficulties that can be associated with patchwork development. A master-plan approach is needed to evaluate alternatives and lay out a roadmap to address opportunities and variables. This section will provide a high-level summary of the evaluations that were performed for the water and sewer infrastructure in the Wye area.

As identified in the Needs Assessment, the WIP area currently has partial water and sewer service provided through a combination of systems. Water service in the northern portion of the area is provided by two small water companies using groundwater wells, water storage tanks, and isolated distribution piping networks. The edges and southern portion of the WIP area currently have little or no water infrastructure.

Sewer service coverage was extended to much of the central WIP area through RSID 8489. The edges and less developed portions of the WIP area currently have little or no sewer services available. The western portion of the WIP area and many of the anticipated growth areas fall outside the boundaries of RSID 8489.

To perform the analysis of and planning for water and sewer infrastructure, the plan area was divided into major sub-areas to facilitate the planning discussion.

Sub-Area A: Often referred to in planning as Deschamps West, this largely undeveloped area is located west of Deschamps Lane and south of I-90. The area is zoned for residential and planned neighborhood development with some agricultural and industrial areas maintained along Deschamps Lane. Although this area is often a topic of conversation for housing development, it lacks all the necessary infrastructure to make this development immediately possible. Significant infrastructure investment will be required to develop properties within this sub-area.

Sub-Area B: This sub-area in the central part of the WIP area, south of I-90 is generally developed with opportunities for redevelopment and increased density and infill in the future. The area is largely zoned for industrial development with some commercial properties near the “Y” intersection south of I-90. The sub-area also includes some residential and neighborhood residential zoning along the

southern boundary of the WIP area. Much of these residential areas are partially developed with some potential for infill and densification should public utilities become available to the properties.

Sub-Area C: North of I-90 and west of Highway 93, this sub-area is zoned commercial along Highway 93 with the rest of the properties zoned neighborhood residential. Most of the area is sparsely and partially developed with significant potential for development and infill.

Sub-Area D: North of I-90 and east of Highway 93, this sub-area is zoned as commercial along Highway 93 with industrial properties along I-90 on the southern boundary of the sub-area. The northeastern part of the sub-area is zoned as neighborhood residential. The commercial area is largely developed though some infill and redevelopment opportunities exist. Much of the industrial area is open for development and redevelopment in the future. The residential properties are generally already developed though there is some undeveloped area for expansion.

Sub-Area E: Commonly referred to as the Butler creek area, this sub-are is located north of I-90 on the eastern edge of the WIP area. It is zoned as planned neighborhood and there is currently almost no development. Significant infrastructure investment will be required to fully develop this area.

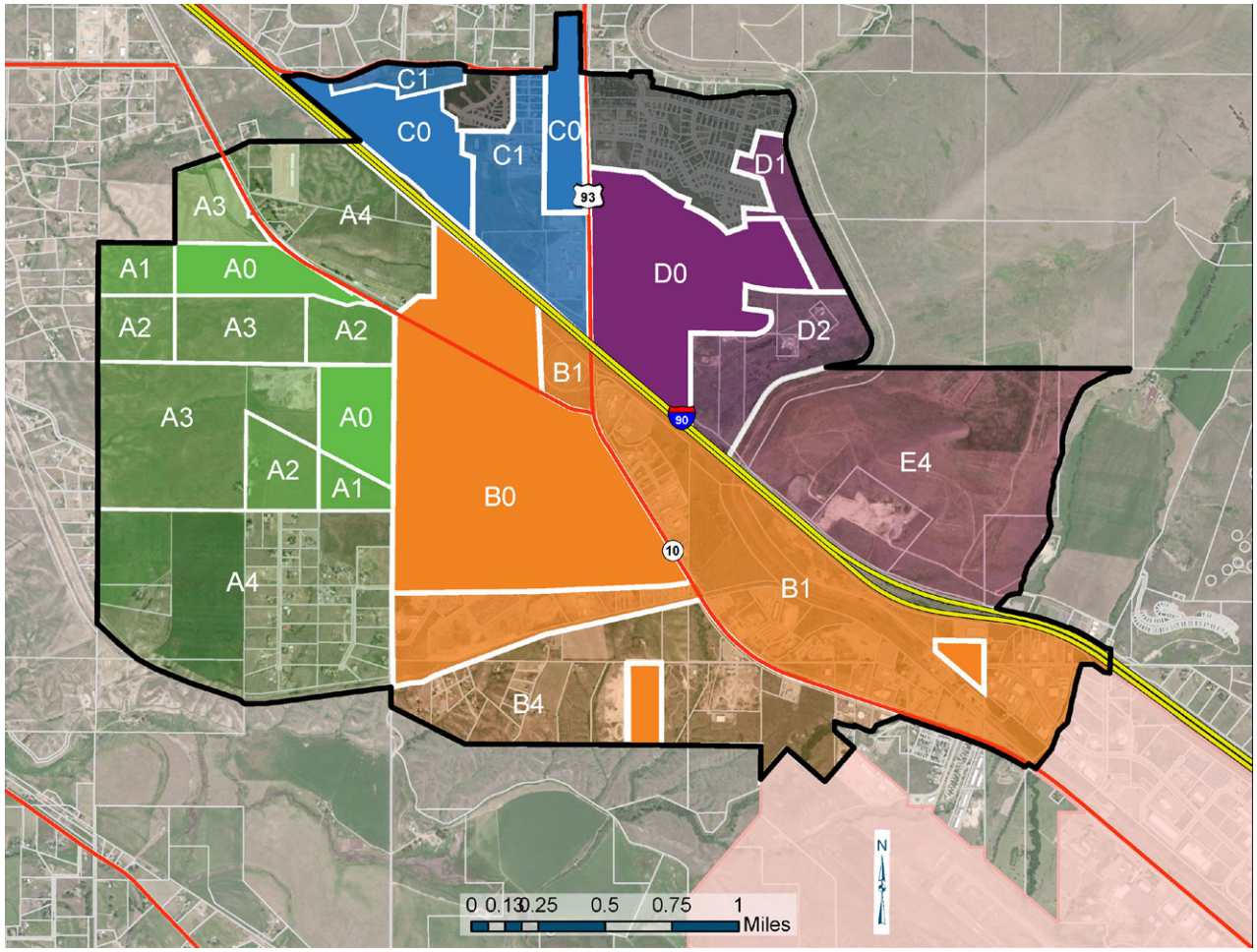


Figure 44. Sub-areas and Phasing of Development

Interstate
Highway
Property Lines
Incorporated Cities and Towns
Infrastructure Plan Study Area

Development Phasing Summary

Phase 0 Catalyst and Precedent Infrastructure
Phase 1 Extend Core Infrastructure and Address Constraints
Phase 2 Infrastructure Expansion for Urban Development
Phase 3 Expand Urban Scale Infrastructure
Phase 4 Expand Urban Infrastructure to Butler Creek and Edges

PHASE 0 DEVELOPMENT EXAMPLES

Planned developments in the B1 industrial area and A1 residential area will require a public water system in the immediate future. These developments, such as Montana Knife Company's headquarters, Grass Valley Industrial, MDT's new maintenance facility, Grass Valley Gardens residential development, and the Riverside Industrial development will each need a public water system capable of providing fire flows. Opportunities to implement public private partnerships should be pursued.

The sub-areas are further evaluated in three major categories:

- A central area (Sub-Areas B, C and D) is relatively developed currently with some water and sewer infrastructure in place. Infill and redevelopment of this central area will result in full development and utilization of these properties will require the least amount of new infrastructure investment.
- An eastern area (sub-area E) that is not currently developed and will require extensive infrastructure investment to make full development of these properties possible.
- A western area (sub-area A) that is sparsely developed and will require significant infrastructure investment to make further development of these properties possible. This area includes land with high potential for urban development, beginning with Neighborhood Residential development with some mixed uses in the near term with investment in catalyst infrastructure.

In addition to the sub-areas listed above, this Plan estimates when portions of the sub-areas are likely to develop over the planning period. The naming of a developed area follows the pattern of "sub-area – phasing stage" (e.g. Sub Area A1). The following phases of development were considered to allow forecasting of water and sewer demands:

Phase 0: The initial phase assumes that development will occur when the Phase 0 precedent and catalyst infrastructure is constructed; refer to the Implementation Strategy section on page 96 of this report for a summary of precedent and catalyst infrastructure. This is development that has likely been identified, is currently in the planning stages, or is otherwise in the process of moving toward becoming a reality.

Phase 1: This phase assumes that development will occur after the extension of core infrastructure and constraints are addressed as detailed in the implementation section. This describes properties that are likely to be developed, but not for several years.

Phases 2 and 3: These phases assume that development will occur once infrastructure is expanded for urban development. This is development that is not known at this time though it may occur later in the planning period.

Phase 4: The fourth and final phase assumes that development will occur later as urban scale infrastructure is expanded, including extension of urban infrastructure to the Butler Creek area and other edges of the WIP area. This is development that is not likely to happen until much later in the planning period and will require a significant infrastructure investment.

Figure 44 on the page 69 shows the sub-areas and the anticipated phasing in a heat-map. Table 11 on page 114 in the Implementation Strategy section summarizes the above information regarding the planning area, the sub-areas, phasing and prioritization of development, and the potential for alternatives to provide infrastructure to the various sub-areas.

Infrastructure Plan
Water and Sewer

Water Capacity Demands
As detailed in the Needs Assessment, the entire WIP area was evaluated to estimate the design flow rates for the water system(s) within the study area and analyze the amount of water needed to serve the area. According to this analysis, the 50-year total water demand for the WIP area is estimated to be around 8.11 MGD or 5,632 gpm.

Wastewater Capacity Demands
Estimated flows for the wastewater system in the WIP area were calculated for each lot based on several variables, including:

- Size
- Zoning
- RSID inclusion
- Development status

Based upon these calculations, the 50-year build-out flow projection for the entire WIP area is approximately 5.25 MGD or 3,646 gpm. As a portion of the study area is currently served by or falls within the existing RSID 8489 served by the City of Missoula, it is important to estimate flows that would originate outside of the current RSID boundary. According to these estimates, approximately 4.33 MGD of wastewater flows are expected to be produced by properties located outside of the current RSID by the 50-year planning horizon. This suggests that only approximately 0.92 MGD is expected from within the current RSID (5.25 MGD – 4.33 MGD = 0.92 MGD) and that flows from outside the current RSID will be over four times greater than those from within it. All flow estimates are conservative and on a 50-year timeframe; increases in flows to the City of Missoula will need to be carefully planned and coordinated with the City.

This information is critical to planning infrastructure accommodations for the collection, conveyance, treatment and disposal of all the wastewater that is expected to be produced within the WIP area. While RSID 8489 provides a relatively simple solution for the properties within the service boundary, the properties located outside that boundary will require a significant investment in the development of new sewer infrastructure.

To aid this current planning effort, it is helpful to consider where these flows outside of the RSID are anticipated to originate, especially in relation to Sub-Areas A and E. According to the lot by lot planning calculations, the following flows for these sub-areas are estimated as follows:

- Sub-Area A (Deschamps W) – approximately 2.15 MGD
- Sub-Area E (Butler Creek) – approximately 1.04 MGD

Year	Projected Water Demand (MGD)		
	Residential	Commercial/ Industrial	Total
5	0.71	0.10	0.81
10	1.77	0.26	2.03
20	3.54	0.52	4.05
30	5.30	0.78	6.08
40	6.36	0.94	7.30
50	7.07	1.04	8.11

Table 6. Projected Drinking Water Demand in Million Gallons per Day (MGD)

Year	Projected Wastewater Demand (MGD)		
	Residential	Commercial/ Industrial	Total
5	0.38	0.06	0.43
10	0.94	0.14	1.08
20	1.89	0.28	2.17
30	2.83	0.42	3.25
40	3.40	0.50	3.90
50	3.78	0.55	4.33

Table 7. Projected Wastewater Demands from Outside of the RSID

The remaining 1.14 MGD of the full 4.33 MGD originating outside the RSID boundary is largely anticipated to come from sub-areas B and C.

Comprehensive water and sewer systems are critical to supporting the growth and urbanization of the Wye area. The current systems are fragmented, leaving many potential development areas underserved. The following section outlines alternatives that were developed for the WIP.

Alternatives Analysis

Missoula County identified three alternatives for evaluation and consideration for comprehensive development of water and sewer infrastructure in the WIP area. The goal of each alternative is to provide an overall infrastructure solution to either the entire WIP area or major portions of it and avoid patchworked, inconsistent, and disconnected solutions. The three alternatives are summarized below with individual alternative projects outlined in the following sections.

Alternative 1 – Missoula Focused Solutions

Under this alternative, water and sewer infrastructure will rely greatly on the extension of service from the City of Missoula.

Water Alternative 1 (W Alt 1) – Under this alternative, the WIP area would be served with drinking water service through a combination of the development of wells and storage facilities within the study area, augmented by an interconnection with the City of Missoula to provide additional water supply. Water will be distributed by a largely new water line network to augment the existing water distribution piping that is currently operated through the independent small water companies. Water Alternative 1 assumes that the City of Missoula is willing to expand their service boundary to provide water, operations and maintenance, and administration of drinking water infrastructure within the WIP area.

Sewer Alternative 1 (SS Alt 1) – Under this alternative, wastewater services would be provided to the properties in the WIP area and will rely on the extension and expansion of services from the City of Missoula. The RSID which currently provides services to much of the core of the existing service area would be expanded to service the entire area. The collection system would be extended and expanded with gravity piping, lift stations, and force mains with treatment and disposal provided at the Reserve WWTP. Under this alternative, the City of Missoula would need to be willing to expand their service boundary and add new customers within the WIP area. Depending on logistics and City of Missoula planning priorities, this alternative may be implemented in the future when smaller on-site sewer systems in areas outside of the RSID are scheduled to come off-line. To preserve the potential for this alternative, smaller systems should be configured for compatibility with future regional collection systems (i.e. they should flow towards regional low points to facilitate future regional lift station installation).

Alternative 2 – On-site or Locally-Focused Solutions
Under this alternative, water and sewer infrastructure will rely upon solutions developed entirely within the study area. This is further described as follows:

Water Alternative 2 (W Alt 2) – Under this alternative, drinking water would be provided to properties within the study area through the development of assets and infrastructure within the study area itself. This will include new and existing wells and storage tanks, new and existing water distribution piping, and other resources. No connection to the City of Missoula is planned, though this could be accomplished with a smaller metered supply coming from Missoula to satisfy some of the study area's water demand needs.

Sewer Alternative 2 (SS Alt 2) – Under this alternative, wastewater services provided to properties within existing RSID 8489 will continue to be served in this way. Properties outside the RSID would need to develop on-site treatment and disposal solutions along with collection and conveyance systems. This will include wastewater collection, wastewater treatment, and disposal of treated effluent within or near the study area itself.

Alternative 3 – MLH-Focused Solutions
Under this alternative, water and sewer infrastructure would rely upon solutions developed around or in partnership with existing and new infrastructure associated with the MLH Montana (MLH) site. MLH is a proposed development located on the former Smurfit Stone site approximately two miles to the west of the Wye area.

The owner of the MLH site is interested in developing a planned community to include a golf course, sports parks, housing, commercial properties, and other new features. The project faces challenges due to the environmental cleanup issues related to the classification of the property as a Superfund site and the associated oversight by state and federal agencies. However, if the MLH project gains traction and begins to move forward with developing their own water system, utilizing wells located relatively near to the WIP area's western boundaries, there may be some advantages for customers within the WIP area to form a cooperative, district, or partnership with the MLH developers to oversee water services in the area to the west of Missoula incorporating both the Wye study area, the MLH project, and beyond. Though many challenges exist with this recommendation, this option was explored as timing and a shared purpose may create benefits for both areas.

This is further described as follows:

Water Alternative 3 (W Alt 3) – Under this alternative, existing and new resources associated with the MLH site will be developed to extend new water supplies (from MLH wells) to newly developed areas. The new facilities will be interconnected with new and existing piping to service the rest of the study area with some of the needed water supplies coming from wells on MLH augmented by additional wells within the Wye study area.

Sewer Alternative 3 (SS Alt 3) – Under this alternative, wastewater services provided to properties within the existing RSID will continue to be served in this way. Properties outside the RSID will either need to develop an on-site solution or, through a more regional approach, participate in a regional solution where a partnership or cooperative is formed utilizing existing and new infrastructure associated with the MLH site along with collection and conveyance systems within the Wye study area.

These alternatives are described in more detail on the following pages.

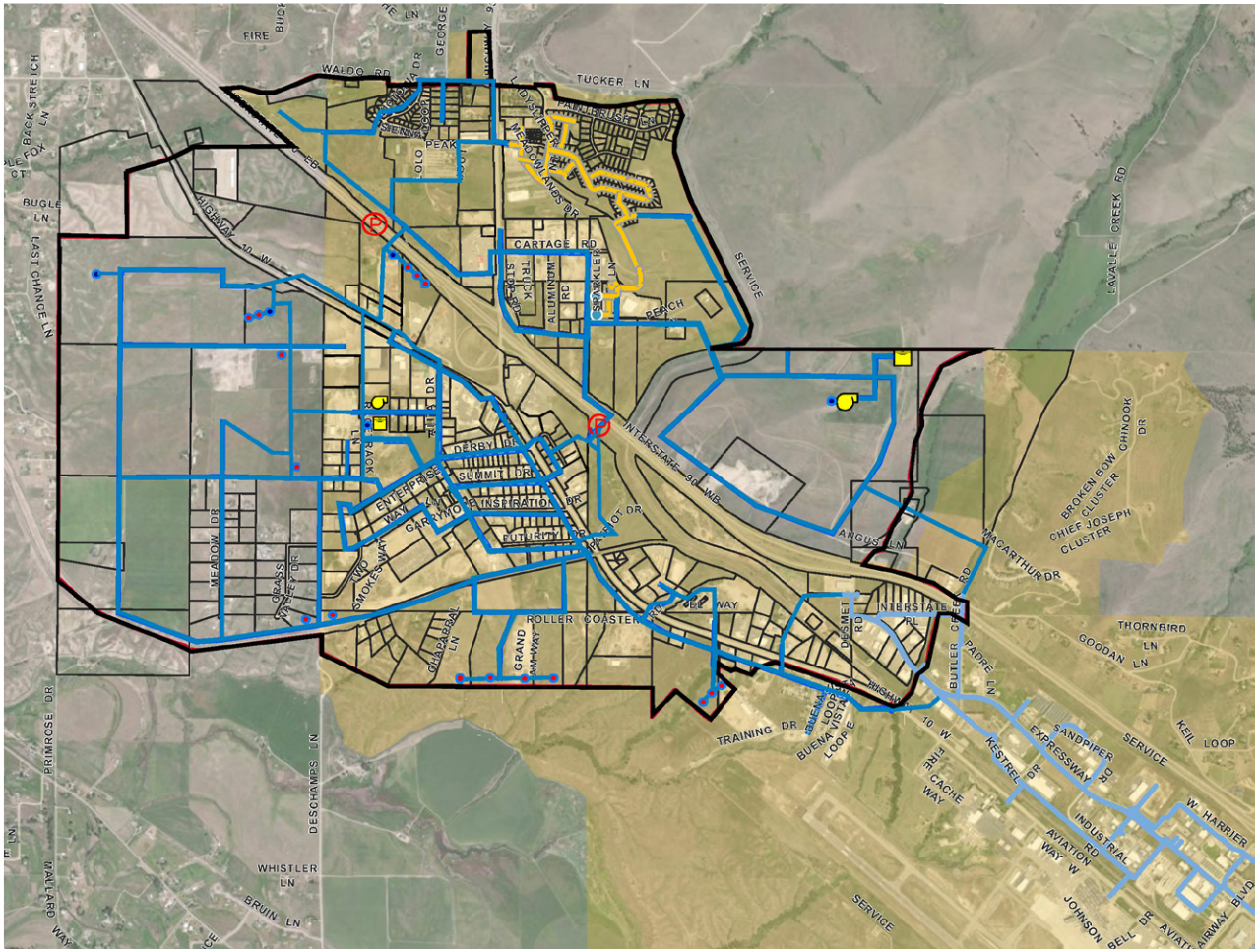


Figure 45. Water Improvements Alternative 1

- Wye Water Wells
- Proposed New Well
- Proposed Water Main - City of Missoula*
- Proposed Water Main - Wye Water System*
- Existing Wye Water System
- Existing Water Main
- Infrastructure Planning Area Boundary
- Utility Service Area
- Ground-Level Storage Tank
- Booster Pump Station
- PRV

**Distributed supply wells likely required*

Water Alternative 1 (W Alt 1)

As discussed previously, Alternative 1 improvements include extending and expanding services from the City of Missoula along with development of facilities within the WIP area. This alternative would provide a wholesale drinking water solution to the entire WIP area. Although a system could be divided along the interstate, an interconnected system would allow all the source, storage, and other facilities developed on each side of the highway to be shared by the entire area.

Improvements with this alternative include:

- ~135,000 lineal feet (~25.6 miles) of new waterline trunk lines.
- Interconnection of existing distribution piping to new piping network to provide comprehensive coverage of the study area.
- Two new 500,000-gallon water storage tanks and one new 1.0-MG water storage tank.
- Three new water booster pumping stations.
- Several new water wells to supply a total water production of approximately 4,000 gpm or 5.76 MGD with an additional 2.35 MGD coming from the City of Missoula interconnection to provide the full 8.1 MGD (5,630 gpm) that is projected for the full study area.
- Several PRV stations to equalize pressure from the north to the south.
- Interconnection(s) to the City of Missoula water distribution system.

Estimated total cost at full build-out: $125.4M.

Infrastructure Plan
Water

Water Alternative 2 (W Alt 2)

The Alternative 2 project for expanding the water system in the study area will rely exclusively on resources and assets developed within the study area with no reliance on resources outside of the study area. This would include wells and storage on both sides of I-90 including new facilities developed primarily to the south of I-90 near Deschamps Lane and in the area to the northeast near Butler Creek. This alternative assumes no interconnection with the City of Missoula, though it may be possible to have a small and metered interconnection with the City that provides for some of the water demand of the customers within the WIP area.

Improvements included with this alternative are summarized as follows:

- ~134,000 lineal feet (25.4 miles) of new waterline trunk lines.
- Interconnection of existing distribution piping to new piping to provide comprehensive coverage of the study area.
- Two new 500,000-gallon water storage tanks and one new 1.0-MG water storage tank.
- Three new water booster pumping stations.
- Several new water wells for a total production of 8.11 MGD.

Estimated cost: $133.6M.

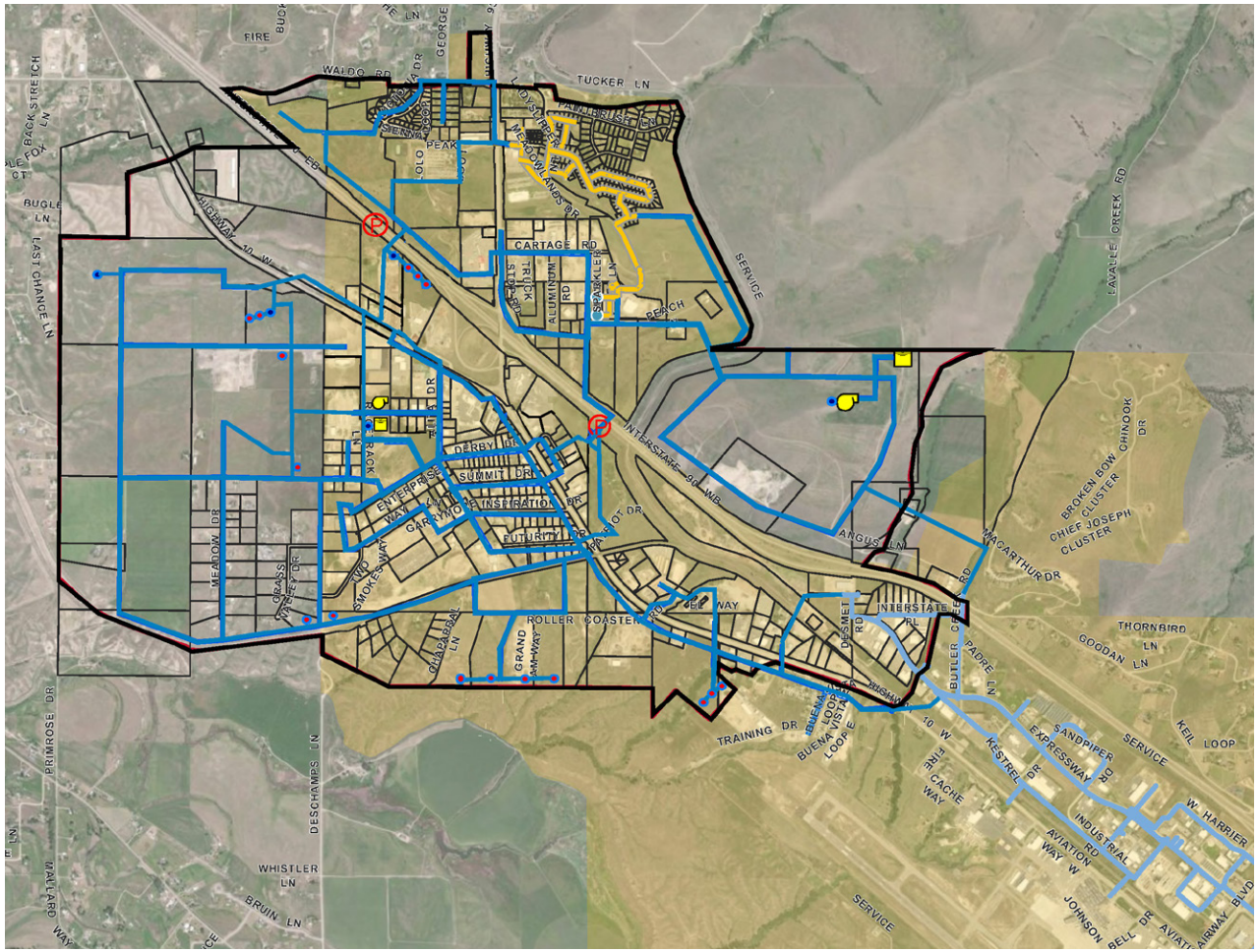


Figure 46. Water Improvements Alternative 2

- Wye Water Wells
- Proposed New Well
- Proposed Water Main - City of Missoula*
- Proposed Water Main - Wye Water System*
- Existing Wye Water System
- Existing Water Main
- Infrastructure Planning Area Boundary
- Utility Service Area
- Ground-Level Storage Tank
- Booster Pump Station
- PRV

**Distributed supply wells likely required*

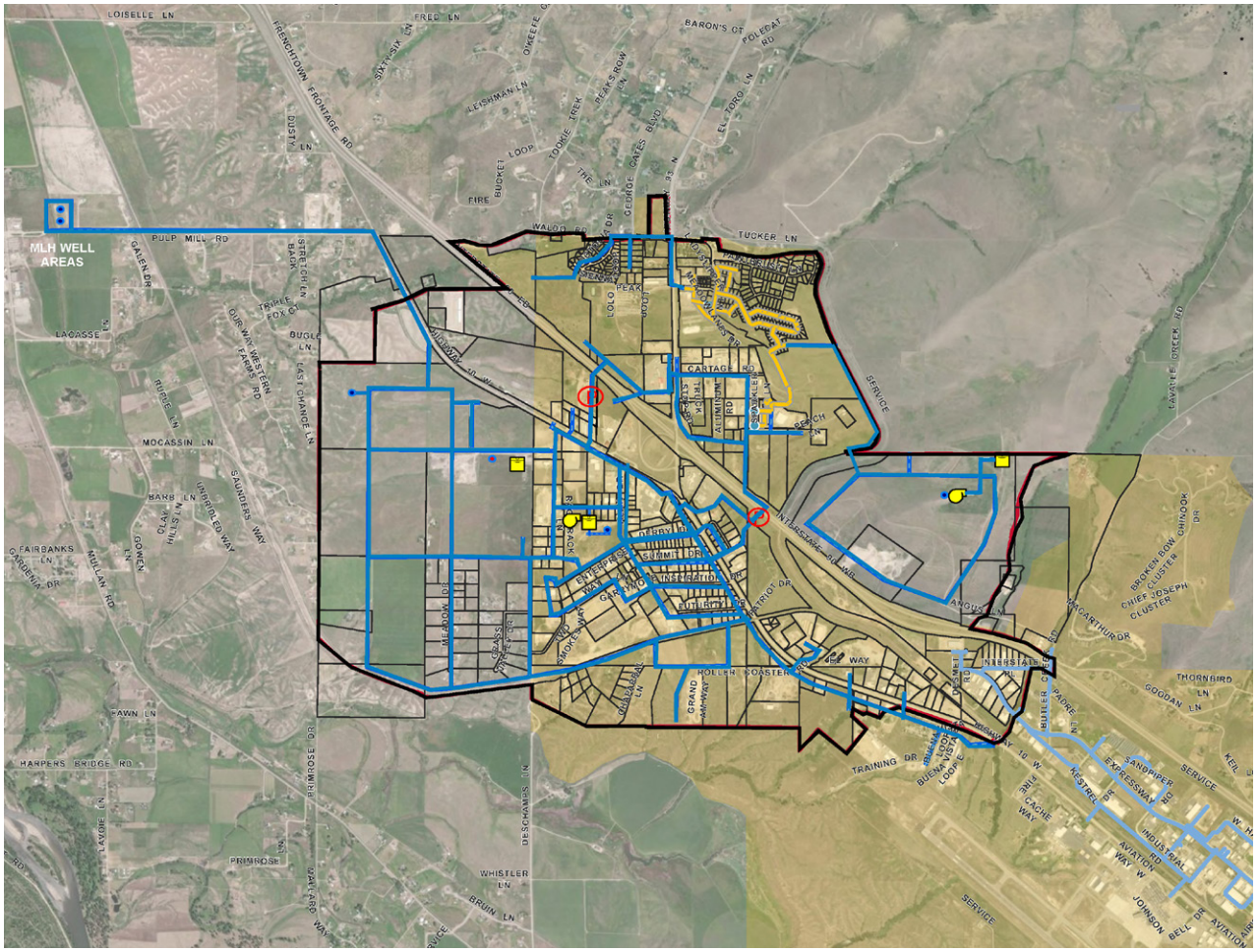


Figure 47. Water Improvements Alternative 3

- Wye Water Wells
- Proposed New Well
- Proposed Water Main - City of Missoula*
- Proposed Water Main - Wye Water System*
- Existing Wye Water System
- Existing Water Main
- Infrastructure Planning Area Boundary
- Utility Service Area
- Ground-Level Storage Tank
- Booster Pump Station
- PRV

**Distributed supply wells likely required*

Water Alternative 3 (W Alt 3)

The Alternative 3 project for expanding the water system in the WIP area will rely on resources within the area itself combined with resources to be developed at the MLH (formerly Smurfit-Stone) site located to the west of the study area. The MLH assets may include rehabilitation and upgrading of existing wells, distribution piping, and sharing of facilities and costs along with other development planned outside of the study area. This alternative does not assume an interconnection with the City of Missoula.

MLH is a proposed development located on the former Smurfit Stone site approximately two miles to the west of the Wye area. The MLH site includes the following potentially viable infrastructure which is currently in the planning phases to be repurposed as water works infrastructure:

- Deep wells 4 and 5, with water rights of 4,706.45 ac-feet of total diverted volume and 4,000 gpm flow (proposed to be used for the public drinking water sources).
- There is an unknown quantity of existing water mains, some of which may be reused after a condition assessment is conducted and pending final alignment of streets and other infrastructure.
- Two water storage tanks, 500,000 gallons each.
- Fire suppression system, including an unknown quantity of water mains and pumping facilities which may be reused.
- Additional wells that will not be used for drinking water.

Infrastructure Plan
Water

Municipal water for the study area would be connected to MLH and would be capable of serving everything in the Wye. However, areas to the north of I-90 could continue to be served by the Wye Area Water System and existing infrastructure on that side of the Interstate, with the Butler Creek Region possibly being served by either or both water sources. Connecting to MLH will require micro-tunneling under the railroad to connect to the study area distribution network.

Improvements with this alternative include:

- ~147,000 lineal feet (27.85 miles) of new trunk waterlines.
- Interconnection of existing distribution piping to new piping to provide comprehensive coverage of the study area.
- Two new 500,000-gallon water storage tanks and one new 1.0-MG water storage tank.
- Three new water booster pumping stations.
- Four new water wells and participation in the rehabilitation of the MLH well(s) for a total water production in excess of 8.11 MGD (5,630 gpm).

Estimated total cost at full build-out: $141.6M.

Water Alternative	Sub-Area Costs ABCDE	Description
1	$125,348,000	City of Missoula infrastructure solution
2	$133,638,000	On-site/local infrastructure solution
3	$141,599,000	MLH infrastructure solution

Table 8. Water Alternatives Cost Summary

Cost Summary

Within this analyses, three alternatives were evaluated for the provision of drinking water services to the properties located within the WIP area. The alternatives varied primarily in the participation of resources and organizations located outside the service area versus the service area remaining independent in terms of providing water supplies and delivering and administering this water to the properties and customers located within the study area.

All three alternatives require significant investment in the development of on-site resources to expand and extend the potable water system to the entire area. This includes the development of some on-site wells, water storage assets, booster pumping assets, and distribution piping. Because all three alternatives require significant investment for the development of assets within the study area, the costs of each of the three alternatives does not vary greatly.

Conclusions and Recommendations

The development of a water system to serve the entirety of the WIP area will require significant investment, cooperation, and administration effort to develop what is, essentially, an entirely new water system for a new planned community. As the existing water infrastructure exists in small pockets and is overseen by individual water companies and operators, it will take time and effort to combine, acquire, and expand upon the existing resources to provide connectivity and comprehensive water services across the entirety of the study area.

This WIP study evaluated three separate alternative approaches to providing water service to the Wye study area. The three alternatives revolve around the following central themes:

1. Water services provided and administered by the City of Missoula
2. Water services provided and administered by a new "Wye" entity water system
3. Water services provided by and/or, in cooperation with, an MLH development located to the west of the study area.

It is likely that the ultimate solution for providing comprehensive water service to the WIP area will require a sequential or staged development plan that could utilize a combination of the planning elements evaluated in the three alternatives discussed above. Each of the alternatives relies upon development of water supply, storage, and pumping facilities within the study area. As such, incremental development at the Wye will involve sequential development of water infrastructure within the study area with likely future connection to systems outside of the study area for supplemental water supply. It is important that any partial or sequential development be undertaken with the ultimate goal of a fully connected, cooperative, and comprehensive water system in mind.

Given the above considerations and evaluation of the alternatives, recommendations for the wholesale development of a comprehensive water system in the WIP area are as follows:

Primary Recommendation

Development of a Wye Area Water District

The formation of a comprehensive water district is recommended that would encompass the entire WIP area boundary and, perhaps, beyond. A water district could be established that absorbs the existing small water companies and provides interconnectivity and resources to serve the entire area. Many challenges exist related to this alternative including political and organizational challenges, financial and technical challenges, and general acceptance from the property owners in the area. It is important to note that initial development within sub areas A and B will almost certainly require the formation of a smaller localized Water District at the onset. Neither of these areas are currently served by existing water systems,

Infrastructure Plan
Water

but both are primed for near-term meaningful development. In pursuit of economic development and adequate taxable value per acre, prioritization of a water system capable of providing industrial fire flow in Sub Area B is the highest priority for near-term development within this growing industrial area of Wye.

Based upon the draft recommendations from this plan, Missoula County has already taken proactive steps towards implementation of the first steps of the water system that will serve Sub Area B. A preliminary engineering report was prepared to ensure that the initial components of the water system (480,000 gallon water storage tank, booster pump, and initial water supply well) fit within a future fully-cooperative and comprehensive water system that serves the entire Wye area. Provisions are included in the initial system that facilitate the first stages of development within Sub-Area A. Construction of the initial water system is anticipated to be completed in winter 2025. Future expansion of this system through Sub-Area B and into Sub-Area A will require development of additional water supply and extension of water mains.

Moving forward, Missoula County should take the following steps with the end goal of developing a comprehensive Wye Area Water District:

- Conduct a comprehensive aquifer study to evaluate water supply options for full build-out.
- Explore purchase of the existing Wye Area Water System (located in Sub Area D and serving Sub Areas C & D). A study of the water system and associated water rights is recommended.
- Continue to develop and expand the water system being built in Sub Area B as opportunities for development and generation of taxable value per acre (and the accompanying tac increment) arise.

Alternative Recommendation: City of Missoula Water System Expansion

The City of Missoula currently owns and operates the largest water system in the region. The City has the administrative resources and experience to manage, operate, and develop a water system in the Wye area through an expansion of their existing water service boundary. The City could significantly increase their customer base and administer the expansion of their existing network into the WIP area as well as add new assets to their own system through the acquisition of existing wells and tanks and the construction of new wells, tanks, and water mains. Alternately, If the City has the interest and political will to provide water to a Missoula County administered utility district through a metered connection at the east end of the study area, this is recommended as a preferred solution to provide water to customers within the WIP area while still maintaining County administrative control over the Wye area. The cost of developing the infrastructure in the WIP area will not be insignificant as water mains, tanks, and wells must be constructed

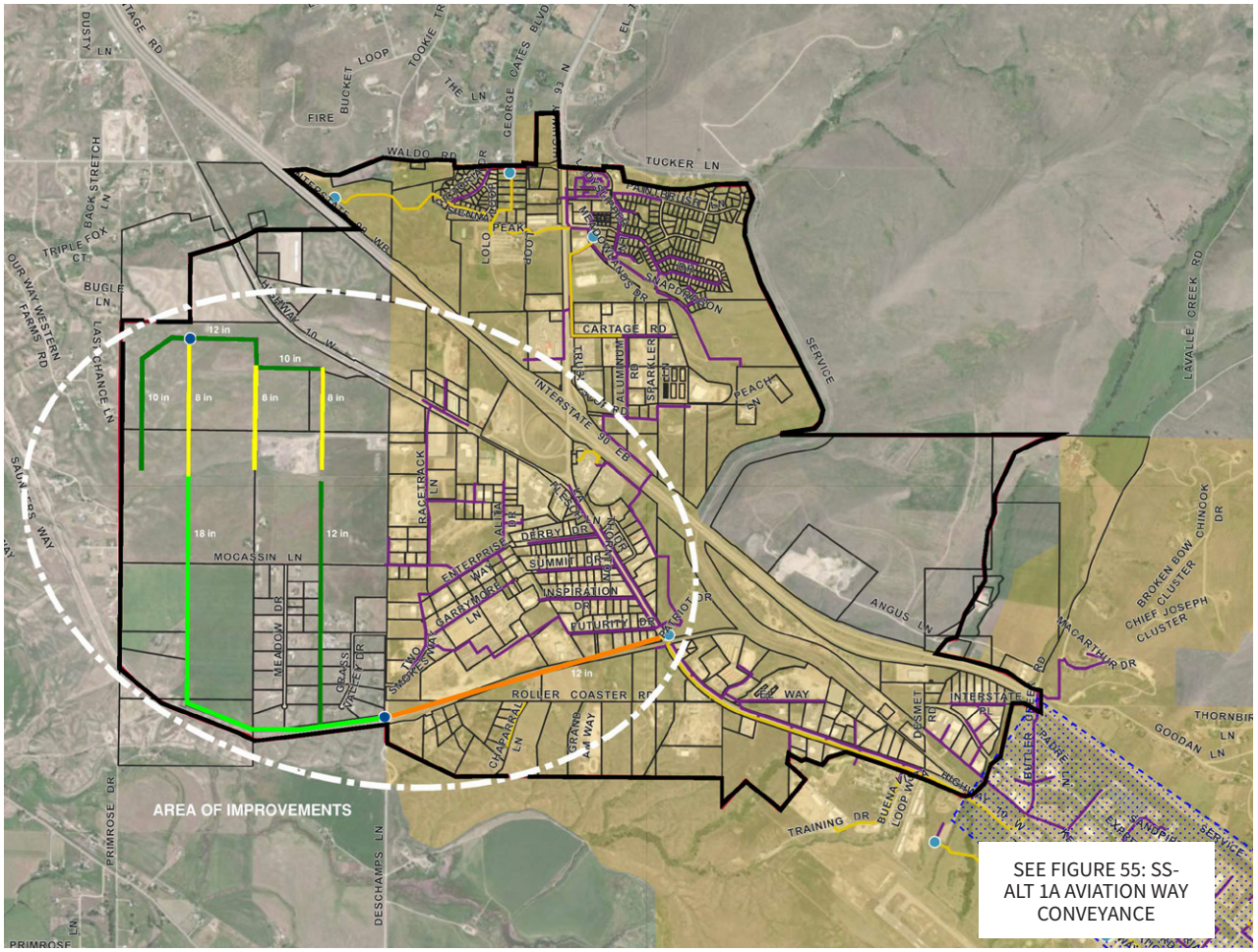


Figure 48. Sewer Improvements Alternative 1A

- Proposed On-Site Treatment System
- Proposed Pump Station
- Existing Sanitary Sewer Lift Station
- 10 - 12" Local Gravity Main
- 15" - 18" Local Gravity Main
- 4" - 12" Local Gravity Main
- 6" - 12" Disposal Force Main
- Existing Sanitary Sewer Force Main
- Existing Sanitary Sewer Gravity Main
- Infrastructure Planning Area Boundary
- Utility Service Area

Sewer Sub Alternative 1A (SS Alt 1A)

This sub-alternative considers potential improvements to collect and convey waste from Sub-Area A (Deschamps W) to the east via Highway 10 and eventually to the Reserve WWTP.

As the existing conveyance system along the Highway 10 corridor and through the Mullan Road area is expected to be at capacity (per the City of Missoula Wastewater Facilities Plan, 2017), a parallel conveyance system will be required to convey the additional 4.33 MGD of wastewater flows from the planning area. This would include a new pump station near the railroad crossing at Highway 10, a new force main, and new gravity sewer through the Mullan Road area, in parallel to the existing system, to convey wastewater flows to the WWTP on Reserve Street. Improvements within this sub-alternative include:

- ~44,000 lineal feet (8.33 miles) of new gravity sewer and associated manholes.
- ~29,000 lineal feet (5.5 miles) of sewer force main
- Surface condition restoration
- Two new wastewater lift stations and a new conveyance lift station
- Improvements at the Reserve WWTP to account for increased wastewater flows from the study area outside the RSID. This item includes a high-level estimate only, to allow for competition with other alternatives.

Estimated cost: $132.7M.

Infrastructure Plan
Sewer

Sewer Sub Alternative 1B (SS Alt 1B)

This sub-alternative considers potential improvements to collect and convey waste from Sub-Area E (Butler Creek) to the east via Highway 10 and eventually to the Reserve WWTP.

The project assumes wastewater flows from the Butler Creek area would be collected and pumped to the intersection of the railroad and Highway 10. From this location, those flows would either go west and into the conveyance down the old railroad right of way (see SS-S2), or they would enter the pumping system conveyance flows to the east as shown on SS-S1. Additional flows will trigger upsize of mains between Momont 1 and 2 as well as likely additional downstream transmission upsizes.

Improvements within this sub-alternative include:

- ~25,500 lineal feet (4.8 miles) of new gravity sewer and associated manholes.
- Restoration of surface conditions
- One new wastewater lift station
- ~10,800 lineal feet (2 miles) of sewer force main

Estimated cost: $16.3M.

Note that this cost is for the collection and conveyance improvements for Sub-area E only and would need to be added to either SS Alt 1A or 1C for the comprehensive cost of serving the entire WIP area.

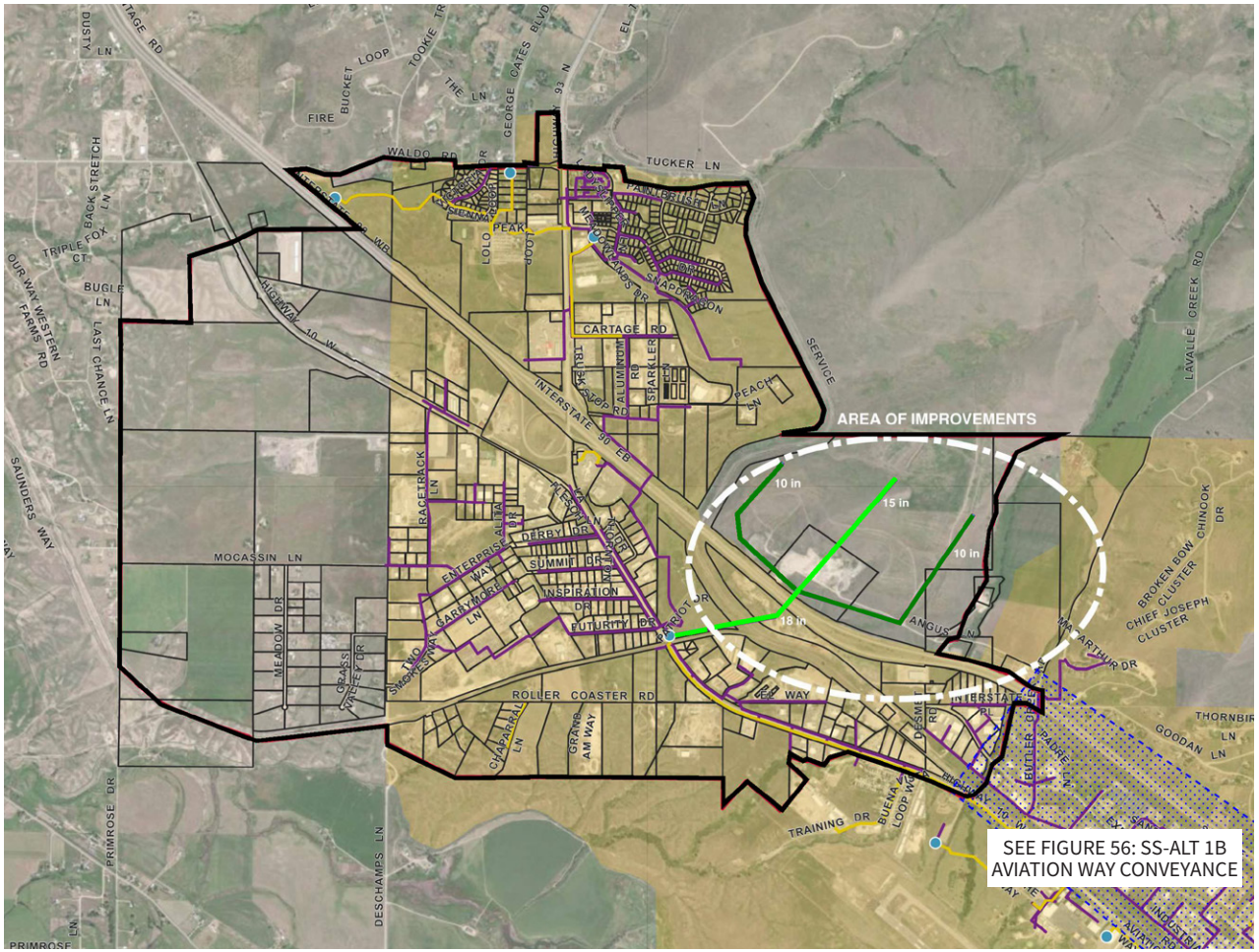


Figure 49. Sewer Improvements Alternative 1B

- Proposed On-Site Treatment System
- Proposed Pump Station
- Existing Sanitary Sewer Lift Station
- 10 - 12” Local Gravity Main
- 15” - 18” Local Gravity Main
- 4” - 12” Local Gravity Main
- 6” - 12” Disposal Force Main
- Existing Sanitary Sewer Force Main
- Existing Sanitary Sewer Gravity Main
- Infrastructure Planning Area Boundary
- Utility Service Area

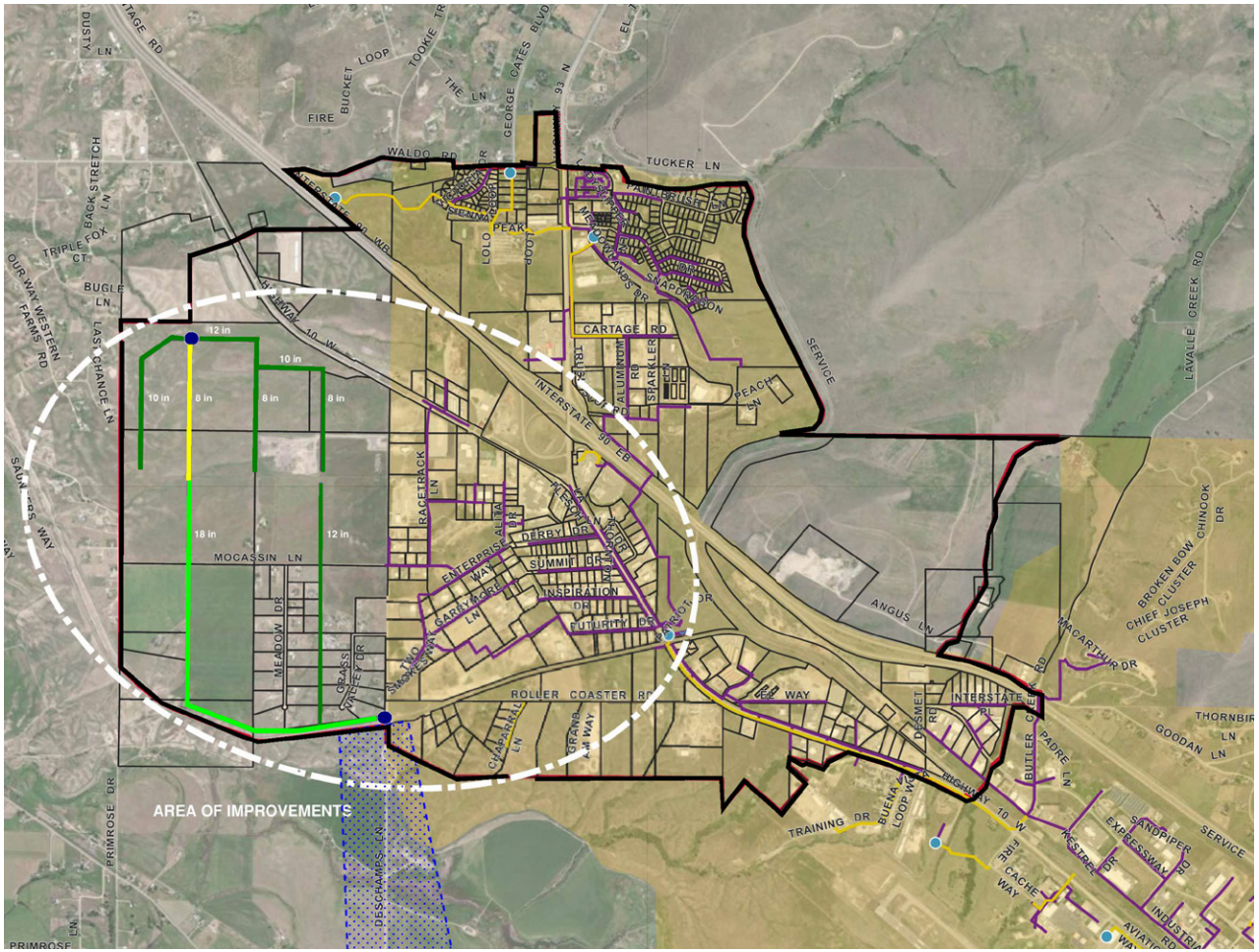


Figure 50. Sewer Improvements Alternative 1C

- Proposed On-Site Treatment System
- Proposed Pump Station
- Existing Sanitary Sewer Lift Station
- 10 - 12” Local Gravity Main
- 15” - 18” Local Gravity Main
- 4” - 12” Local Gravity Main
- 6” - 12” Disposal Force Main
- Existing Sanitary Sewer Force Main
- Existing Sanitary Sewer Gravity Main
- Infrastructure Planning Area Boundary
- Utility Service Area

Sewer Sub Alternative 1C (SS Alt 1C)

This sub-alternative considers potential improvements to collect and convey waste from Sub-Area A (Deschamps W) to the south via Deschamps Lane and then along the old Railroad Right-of-Way which leads, in a relatively straight alignment, to the Reserve WWTP. This approach is considered as an alternative to a conveyance system along the Airport corridor which is included in Alternatives 1A and 1B above.

This project is developed as a standalone project for the purposes of comparing the costs of providing sewer service to Sub-Area A which is currently outside of the RSID.

Improvements within this sub-alternative include:

- ~21,000 lineal feet (4 miles) of new gravity sewer and associated manholes.
- ~40,000 (7.6 miles) lineal feet of sewer force main
- Restoration of surface conditions
- One new neighborhood wastewater lift station
- A larger conveyance lift station to pump from Deschamps, down the R/R ROW to the Reserve St. WWTP.
- Improvements at the Reserve WWTP to account for increased wastewater flows from Sub-Area A.

Estimated cost: $120.8M.

Sewer Alternative 2 (On-site Solutions)

The Alternative 2 sewer infrastructure improvements seek to develop on-site and local resources and assets to collect, convey, treat, and dispose of wastewater that will be generated particularly within sub-areas A and E within the study area. Additional on-site solutions may be needed in Sub-area B3 as this area could redevelop with higher density and require an on-site or regional treatment and disposal solution.

This analysis assumes the following for wastewater treatment facilities:

- Capacity needs of 2.15 MGD for Sub-Area A and 1.0 MGD for Sub-Area E.
- On-site facilities based around using membrane bioreactor (MBR) technology and housed within a building to facilitate and allow for local development around the facilities.
- The treatment facilities would include a "complete" treatment process including headworks screening, solids treatment and disposal, disinfection, controls and automation, and other features consistent with modern MBR treatment facilities.

The major difficulty to solve related to on-site wastewater solutions is the ultimate disposal of treated wastewater effluent. Alternatives considered included surface discharge to the Clark Fork River, summer irrigation, rapid infiltration (RI) ponds, and subsurface RI chambers/cells. It may also be possible to design water features into some of the development that could reuse water for fountains, ponds, etc.

For the purposes of this analysis, subsurface rapid infiltration cells were selected for their disposal capabilities throughout the year without concern about low temperatures. There is also available land with high percolation/conductivity rates that will be effective for disposal.

The feasibility of this alternative requires that a suitable soil type be present on site to facilitate reasonable infiltration rates. The soil must provide adequate hydraulic conductivity and percolation to disperse the effluent and meet minimum concentration requirements at the edge of the groundwater mixing zone. Other considerations for groundwater discharge include the following:

- To proceed with RI discharge, a groundwater discharge permit must be obtained from MDEQ. However, if it is determined that the groundwater beneath an RI site is hydrologically connected to surface water, then the discharge will not be considered a groundwater discharge and surface water permitting rules will apply.
- Groundwater monitoring is also required for RI systems. Monitoring wells must be installed near the groundwater discharge, with the number and placement determined by MDEQ. Additionally, the RI site location must be protected from flooding and must not be located within the 100-year floodplain of any waterway. The site must also be located a minimum of 500 feet from water supply wells. This requirement may further limit feasible discharge locations.

It is assumed that wastewater generated within existing RSID 8489 (largely Sub-Areas B, C and D) will continue to flow to the City of Missoula for treatment and disposal. There are portions of Sub Areas B and C that are within the City of Missoula's Wastewater Treatment Plant Service Boundary but are outside of the boundary of RSID 8489; these areas are anticipated to flow to the City of Missoula as development occurs. A detailed analysis of flows generated within the City Utility Service Area but outside the RSID boundary should be coordinated with the City of Missoula.

Two sub-alternatives were considered as part of this analysis which are summarized on the following pages.

Sewer Sub Alternative 2A (SS Alt 2A)

This sub-alternative considers potential improvements to collect and convey waste from Sub-Area A (Deschamps W) to a centralized treatment facility located within Sub-Area A for treatment and disposal.

The NRCS Web Soil Survey indicates that the site soils in Sub-Area A are dominated by clay loams with low hydraulic conductivity, which would be poor choices for subsurface rapid infiltration disposal cells. However, the Web Soil Survey does indicate the existence of Bigarm gravelly loam in several portions of the region. This appears to be the most viable location for any potential groundwater discharge from the Deschamps Lane Region. Several wells in this area will influence where the treatment and disposal system can be located.

The minimum hydraulic conductivity for the Bigarm gravelly loam is listed as 0.57 - 1.98 in/hr by NRCS. Assuming that the average conductivity in this Bigarm gravel area is a more conservative 1.25 in/hr, according to the EPA Wastewater Technology Fact Sheet on Rapid Infiltration, the area required for disposal is calculated using:

$$A = (.0048)(Q) / (L)$$

Where,

A is infiltration area in acres,
Q is flow rate in gallons per day,
And L is the annual hydraulic loading into the basin in ft/yr or the conductivity rate of the soil in ft/yr

If the new MBR plant was operating at peak flows to service Sub-Area A, the flow is estimated to be 2.15 MGD at full build out using the WIP planning estimates of 12 dwelling units per acre, 2.3 persons per dwelling unit, and conservatively assuming 100 gallons per day per capita. Actual sewer generation per dwelling unit for the densities assumed in the plan will likely be closer to 150-160 gallons per day per dwelling. Using the conservative assumption for the conductivity of 1.25 in/hr, the estimated needed area for rapid infiltration is calculated to be 11 acres. Anticipated nitrogen concentration from modern MBR facilities is 5 mg/L.

The available land in the Bigarm gravel deposit area is estimated to be around 40 acres; split between a 6-acre area in the northern third of Sub-Area A and a 34 acre area near Moccassin Lane. If three “major infiltration zones” are set up to allow for rotation from one area to another over several days, three completely separate subgrade outfall zones can be set up allowing for three full 11-acre rapid infiltration zones. The plant could discharge to one zone for several days before switching to another outfall zone allowing the first zone to settle and “dry out” before returning to the original zone.

If 2.15 MGD is distributed over 11 acres of infiltrators chambers or RI cells, the depth of water introduced to each infiltrator chamber is approximately 7 inches of water in a day. If the percolation rate is 1.25 in/hr, there will be little to no water “stored” in the chambers after a full day of operation as the percolation rate is far greater than discharge rate from the treatment plant. Given that, rotation from one major zone to another will further increase the conservative nature of the rapid infiltration system by allowing 5-10 days of rest between “dosing” runs for each major zone.

The RI zones can be constructed in such a way that the land could be used for many alternative uses as the infiltration chambers allow for H-20 vehicle loading. Soil and grass could be placed over the zones allowing them to be used as soccer, football, baseball or other sports fields. Once installed, there would be little to no indication of the rapid infiltration disposal of effluent taking place beneath the surface.

Sub-Area A will be constructed in phases, with the A0 areas proceeding first. As the treatment facilities are built in “phases” of capacity, the rapid infiltration system can also be constructed in similar phases to align with the capacity needs of the treatment plant.

Infrastructure Plan
Sewer

Sewer Sub Alternative 2A (SS Alt 2A)

The full build out scenario for SS Alt 2A is presented here as a standalone project for the purposes of comparing the costs of providing sewer service to Sub-Area A which is currently outside of the RSID.

Improvements within this sub-alternative include:

- ~28,500 lineal feet (5.4 miles) of new gravity sewer and associated manholes.
- ~8,200 lineal feet (1.55 miles) of sewer force main.
- Restoration of surface conditions.
- One new wastewater lift station.
- A new on-site wastewater treatment facility centered around MBR technology.
- Facilities for the on-site disposal of treated wastewater effluent via subsurface rapid infiltration.

Estimated total cost at full build out: $120M.

A step wise progression towards development of Phases A0 and A1 is presented on the following pages.

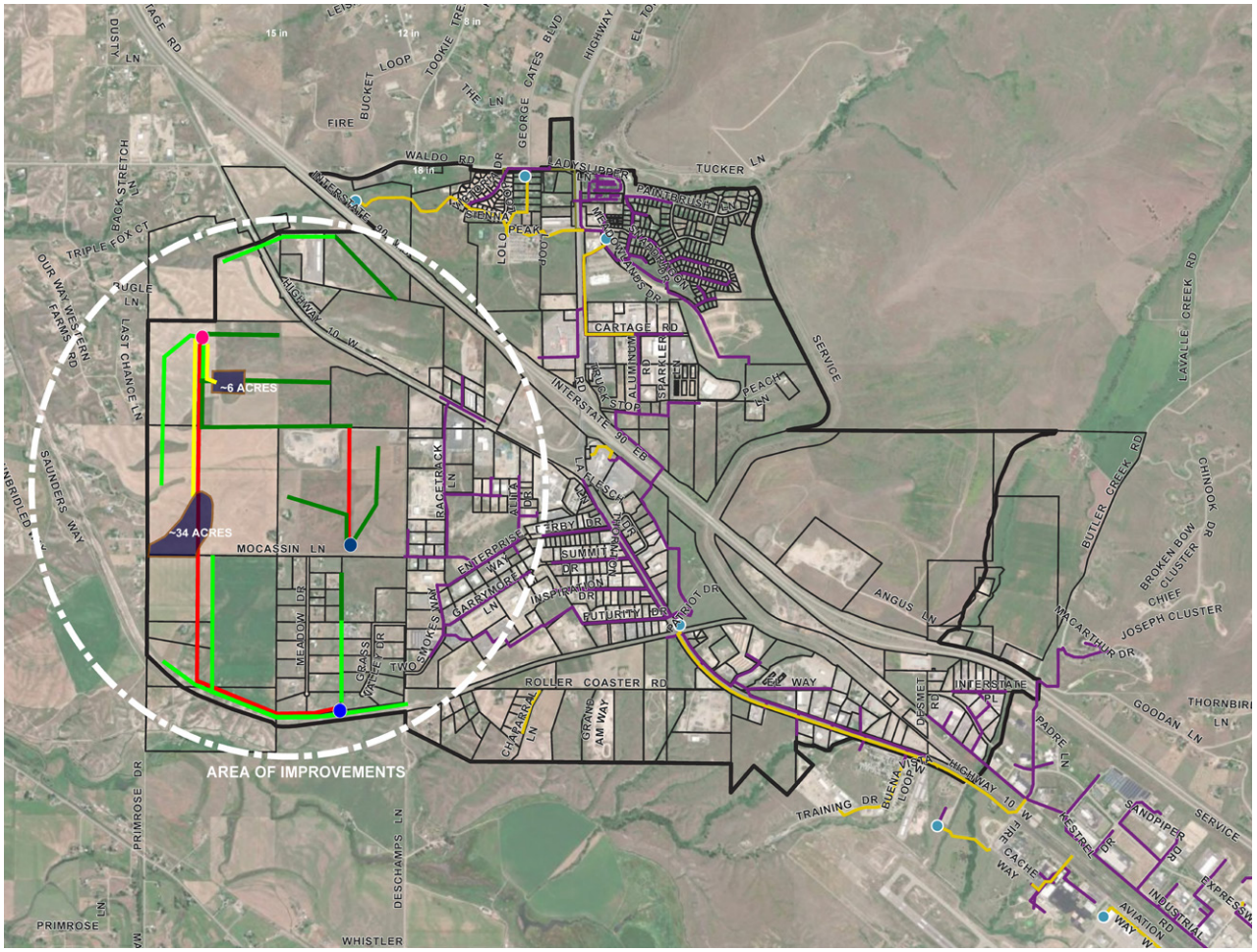


Figure 51. Sewer Improvements Alternative 2A

Figure 52. Sub-areas for improvements

The following step wise process would facilitate initial development in Sub-Area A.

Phase 0: Construct an initial MBR facility capable of treatment and disposal of 150,000 gallons per day, implemented in up to three steps: beginning with at least 60,000 to 120,000 gallons per day treatment and disposal capacity and incrementally expanding to 150,000 gallons per day with modest additional investment. It is anticipated that this initial investment will support the residential, industrial, and modest commercial development currently planned within the A0 portions of Sub-Area A.

- Locate facility at the regional low point near the northwest corner in the northern segment of area A0. This location allows for gravity service for the northern half of Sub-Area A, and is the logical location for development of the entirety of the Sub-Area based upon development sequencing.
- Design, permit and construct initial MBR facility to include headworks, screening, solids treatment, equalization tanks, controls and automation. MBR facility should be housed within a building to facilitate and allow for local development around the facilities.
  - Initial MBR facility should accommodate at least 60,000 gallons per day, with a building designed for scalability to 150,000 within the building footprint.
  - Ensure site planning, below grade infrastructure and building placement is developed with expansion for Phase 1 improvements in mind and that additional land is reserved for expansion to Phase 2 and beyond.
- Design, permit and construct pumping and disposal facilities for the on-site disposal of treated wastewater effluent via subsurface rapid infiltration within 6-acre areas in the northern third of Sub-Area A. Pumping facilities and transport piping to disposal area should be sized to accommodate at least 500,000 GPD eventual loading. DEQ discharge permit required.
- Design, permit, and construct supplemental treatment train components to allow incremental expansion of MBR facility from 120,000 GPD to 150,000 GPD. Expand discharge permit and disposal areas to accommodate incremental expansion.
- Anticipated Cost for Initial 120,000 gallon per day MBR treatment, subsurface rapid infiltration, and trunk line collection system for connection to A0 areas = $16M; incremental expansion from 120,000 to 150,000 GPD = $500K

Phase 1: Expand initial MBR facility from 150,000 GPD to 300,000 - 400,000 GPD to facilitate development of A1 areas and initial expansion of development into A2 areas.

- Design, permit, and construct addition to initial MBR building to accommodate sequential treatment trains for treatment of 300,000 to 400,000 gallons per day. Expand equalization tanks as required.

- Site and facility planning for expansion should accommodate for connection and expansion of Phase 2 treatment system.

- Design, permit and construct expansion of on-site disposal of treated wastewater effluent via subsurface rapid infiltration within 6-acre areas in the northern third of Sub-Area A. Utilize pumping facilities and transport piping constructed with Phase 0. DEQ discharge permit update required.
- Anticipated Cost for expansion of Phase 0 (150,000 GPD system) to 300,000 - 400,000 GPD including extension of collection system to A1 areas = $10.5M

Sewer Sub Alternative 2B (SS Alt 2B)

This sub-alternative considers potential improvements to collect and convey waste from Sub-Area E (Butler Creek) to a new on-site wastewater treatment facility located within Sub-Area E for treatment and disposal.

It is assumed that a package MBR treatment plant would be installed on site that is sized to treat the full projected build-out flow of Sub-Area E. The feasibility of this alternative is difficult to quantify because there is limited soil information available for the area. The 2008 PER states that the soils in the WYE area generally consist of a silty clay loam on the surface, exceeding 60 inches in depth, that overlay deeper layers of sands and gravels. The top layer of clay loam will provide poor infiltration rates for any groundwater discharge. The NRCS Web Soil Survey indicates that the majority of the Butler Creek Region (Sub-Area E) consists of the Minesinger-Bigarm complex soil profile, which has a minimum hydraulic conductivity (Ksat) of 0.06 to 0.20 in/hr. Montana Circular DEQ-2 states that soil hydraulic conductivity should be greater than 0.6 in/hr for a site to be considered for infiltration discharge. Based on the limited soil information available, treated effluent would need to be discharged below the clay layer via subsurface absorption cells, or the layer would need to be removed and replaced with a better draining soil to utilize infiltration/percolation (IP) basins in this soil area.

However, there appears to be a small deposit of Bigarm gravelly loam in the far northeast portion of the region. The minimum hydraulic conductivity for this gravelly loam is listed as 0.57 - 1.98 in/hr by NRCS. This appears to be the most viable location for any potential groundwater discharge from the Butler Creek Region. Montana GWIC data shows several wells in this area that will influence where the treatment system can be placed.

Assuming that the conductivity in this Bigarm gravel area is a more conservative 1.25 in/hr, according to the EPA Wastewater Technology Fact Sheet on Rapid Infiltration, the area required for disposal is calculated using:

$$A = (.0048)(Q) / (L)$$

Where,
A is infiltration area in acres,
Q is flow rate in gallons per day,
And L is the annual hydraulic loading into the basin in ft/yr or the conductivity rate of the soil in ft/yr

If the new MBR plant was operating at peak flows to service Area E, the flow is estimated to be 1 MGD. Using the conservative assumption for the conductivity of 1.25 in/hr, the estimated needed area for rapid infiltration is calculated to be 5.25 acres.

The available land in the Bigarm gravel deposit area is estimated to be in excess of 15 acres. If three “major zones” are set up to allow for rotation from one area to another over several days, three completely separate subgrade outfall zones can be set up allowing for 3 full 5.25-acre zones. The plant could discharge to one zone for several days before switching to another outfall zone allowing the first zone to settle before returning to the original zone. If 1 MGD is distributed over 5.25 acres of infiltrators chambers, the depth of water introduced to each infiltrator chamber is approximately 7 inches of water in a day. If the percolation rate is 1.25 in/hr, there will be little to no water “stored” in the chambers after a full day of operation as the percolation rate is far greater than discharge rate from the treatment plant. Given that, rotation from one major zone to another will further increase the conservative nature of the rapid infiltration system by allowing 5-10 days of rest between “dosing” runs for each major zone.

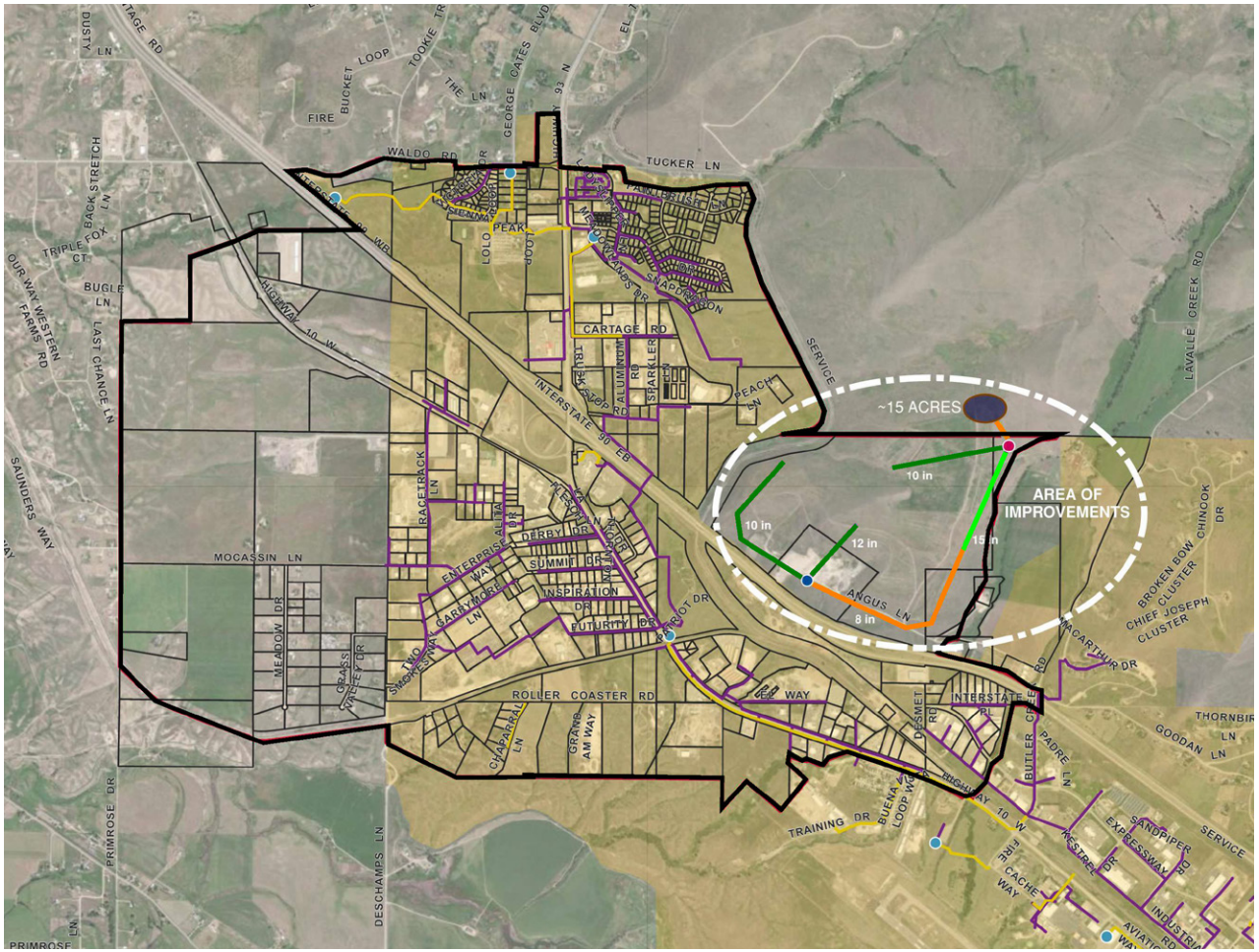


Figure 53. Sewer Improvements Alternative 2B

- Proposed On-Site Treatment System
- Proposed Pump Station
- Existing Sanitary Sewer Lift Station
- 10 - 12” Local Gravity Main
- 15” - 18” Local Gravity Main
- 4” - 12” Local Gravity Main
- 6” - 12” Disposal Force Main
- Proposed IP Basin Area
- Existing Sanitary Sewer Force Main
- Existing Sanitary Sewer Gravity Main
- Infrastructure Planning Area Boundary
- Utility Service Area

Sewer Sub Alternative 2B (SS Alt 2B)

This project is developed as a standalone project to allow for direct comparison with other alternatives. Improvements within this sub-alternative include:

- ~9,500 lineal feet (1.8 miles) of new gravity sewer and associated manholes.
- ~4,700 lineal feet (0.9 miles) of sewer force main
- Restoration of surface conditions.
- One new wastewater lift station.
- A new on-site wastewater treatment facility using MBR technology.
- Facilities for the on-site disposal of treated wastewater effluent via infiltration.

Estimated cost: $67.9M.

Infrastructure Plan
Sewer

Sewer Sub Alternative 3 (SS Alt 3)

This sub-alternative considers potential improvements to collect and convey waste from Sub-Area A (Deschamps W) to new facilities located on the MLH site for treatment and disposal. The viability of this alternative depends on several factors including, but not limited to, the following:

- The development of the MLH property along with financial partnering and collaboration that could come with that development.
- The reinstatement or reissuance of the MLH surface water outfall to the Clark Fork. This issue is under consideration and, if approved, will provide a valuable means of disposal for high quality wastewater effluent from the area.
- The ultimate disposition and decisions surrounding the MLH site and its ability to transition from a Superfund site to a new planned community development.

Improvements within this sub-alternative include:

- ~36,500 (6.9 miles) lineal feet of new gravity sewer and associated manholes.
- ~6,800 lineal feet (1.3 miles) of sewer force main.
- Restoration of surface conditions.
- Two new wastewater lift stations.
- Participation in the development and construction of a new regional wastewater treatment facility using MBR technology.

Estimated cost: $99.6M.

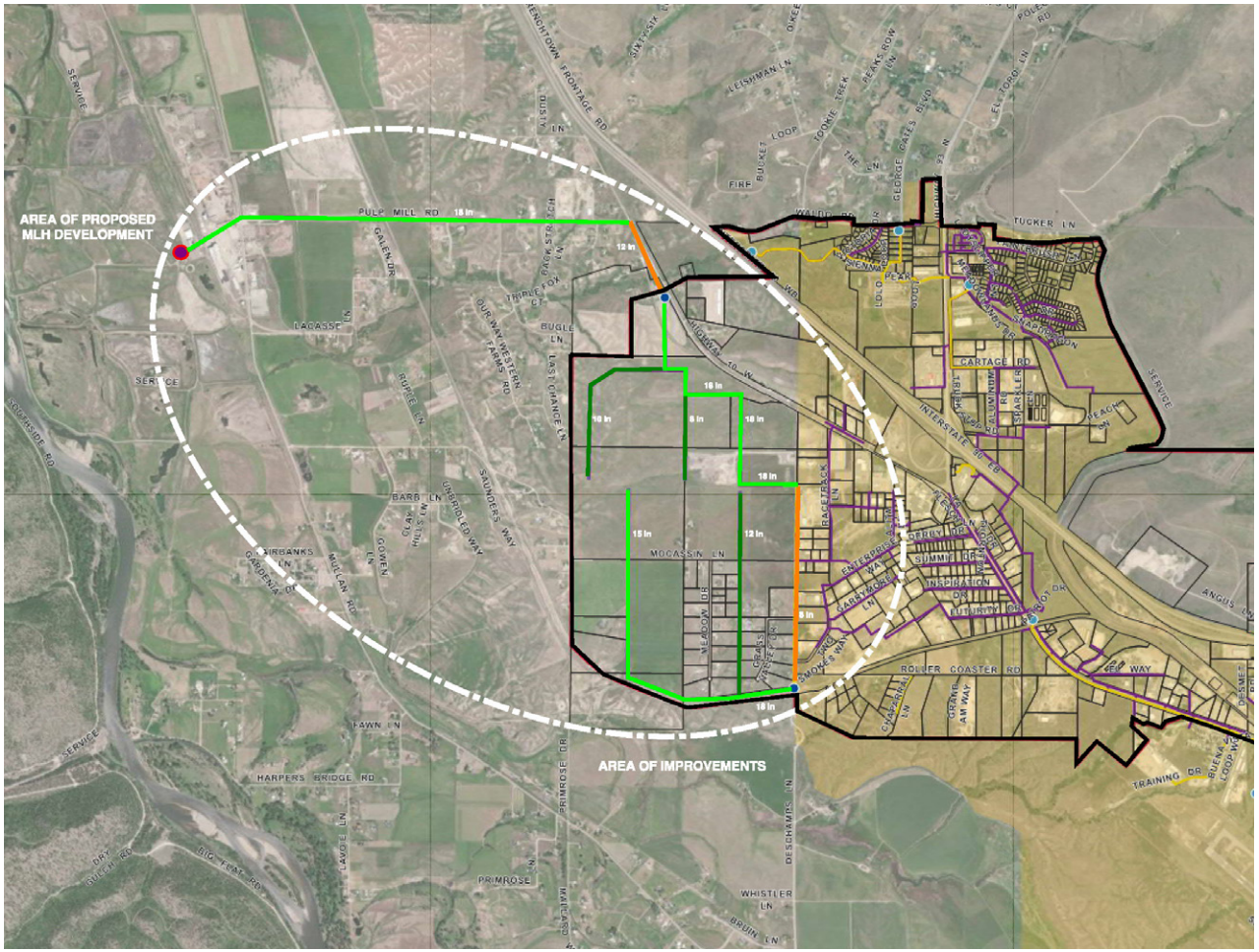


Figure 54. Sewer Improvements Alternative 3

Sewer (WW) Alternative	Sub-Area Costs			Description
	A	B,C,D	E	
1A	$132,726,000	RSID	N/A	City of Missoula infrastructure solution
1B	N/A	RSID	$16,288,000	City of Missoula infrastructure solution
1C	$120,837,000	RSID	N/A	City of Missoula infrastructure solution
2A	$119,951,000	RSID	N/A	On-site/local infrastructure solution
2B	N/A	RSID	$67,875,000	On-site/local infrastructure solution
3	$99,595,000	RSID	N/A	MLH infrastructure solution

Table 9. Sewer Alternatives Cost Summary

Note: For a comprehensive sewer system, a combination of the above alternatives would be required. For example:

- *Alternative 1A would require the addition of Alternative 1B.*
- *Alternative 1C would require the addition of Alternative 1B.*
- *Alternative 2A would require the addition of either Alternatives 1B or 2B.*
- *Alternative 3 would require the addition of either Alternatives 1B or 2B.*

Cost Summary

The WIP area currently includes a wastewater RSID that provides wastewater services to a significant number of properties in the central portion of the study area within Sub-Areas B,C, and D. Wastewater flows from these properties are collected and conveyed to the Reserve Street WWTP via facilities along Airport Way and south through the Mullan area. For the purposes of this evaluation, it is assumed that the properties and Sub-Areas that are currently part of the RSID and also properties within the Missoula Wastewater Treatment Plant Service Area will continue to receive sanitary sewer services from the City of Missoula via the RSID including in-fill and redevelopment within the RSID boundary. It is also possible that properties located along the borders of the RSID that are not currently serviced by it are potential candidates for petitioning for service resulting in modest expansion of the RSID service borders over time. This may apply to areas located inside the RSID out boundaries as well as other areas such as Sub-Area B3. There will likely be costs associated with upgrading the existing Missoula wastewater system to accommodate forecasted density increases within the City Utility Service.

This assumption leaves the Sub-Areas of A and E without an RSID solution for collection, conveyance, treatment, and disposal of wastewater flows originating from these sub-area properties. Therefore, this analysis and evaluation considers alternatives for providing wastewater services to these Sub-Areas.

Infrastructure Plan
Sewer

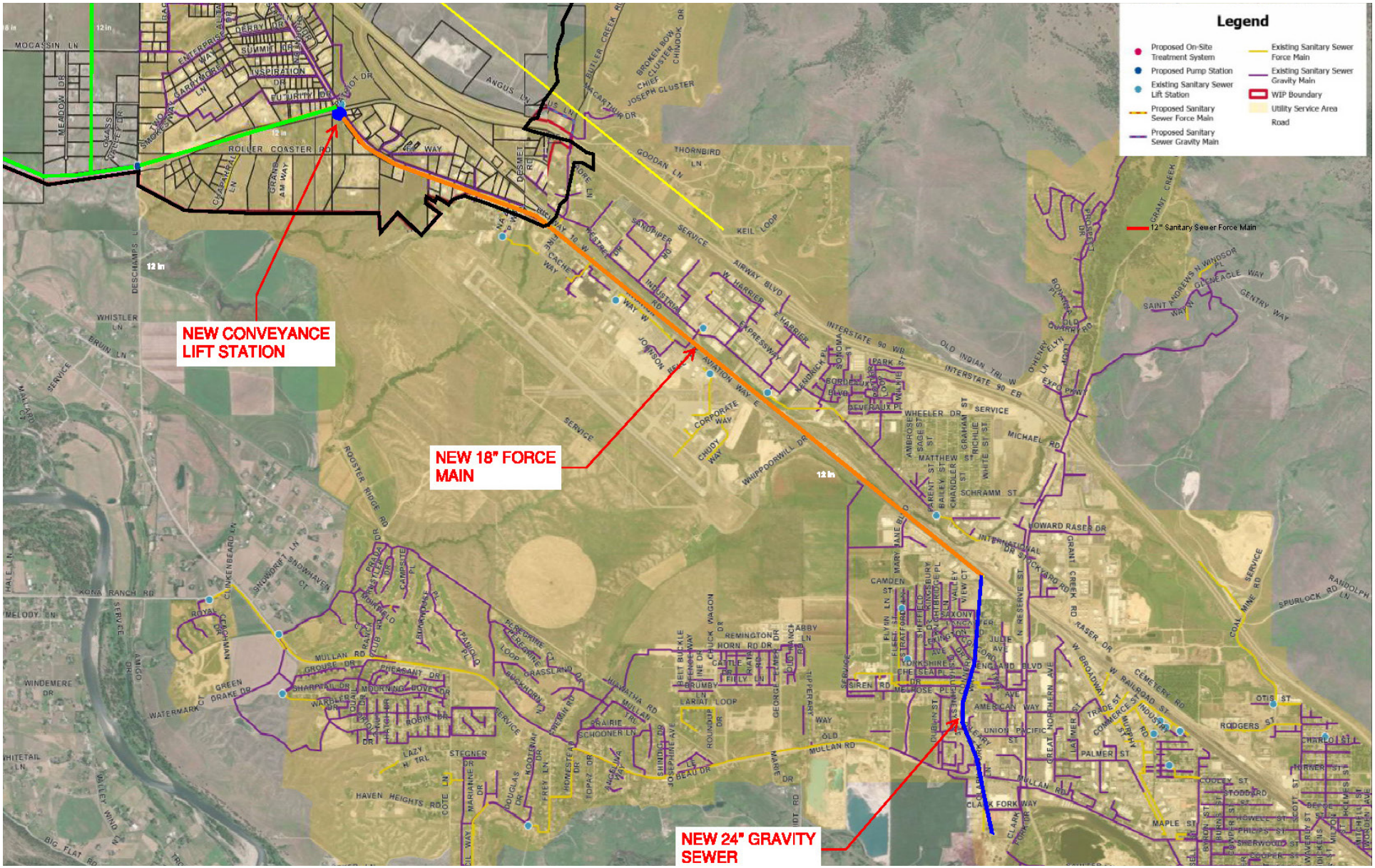


Figure 55. SS-Alt 1A Aviation Way Conveyance

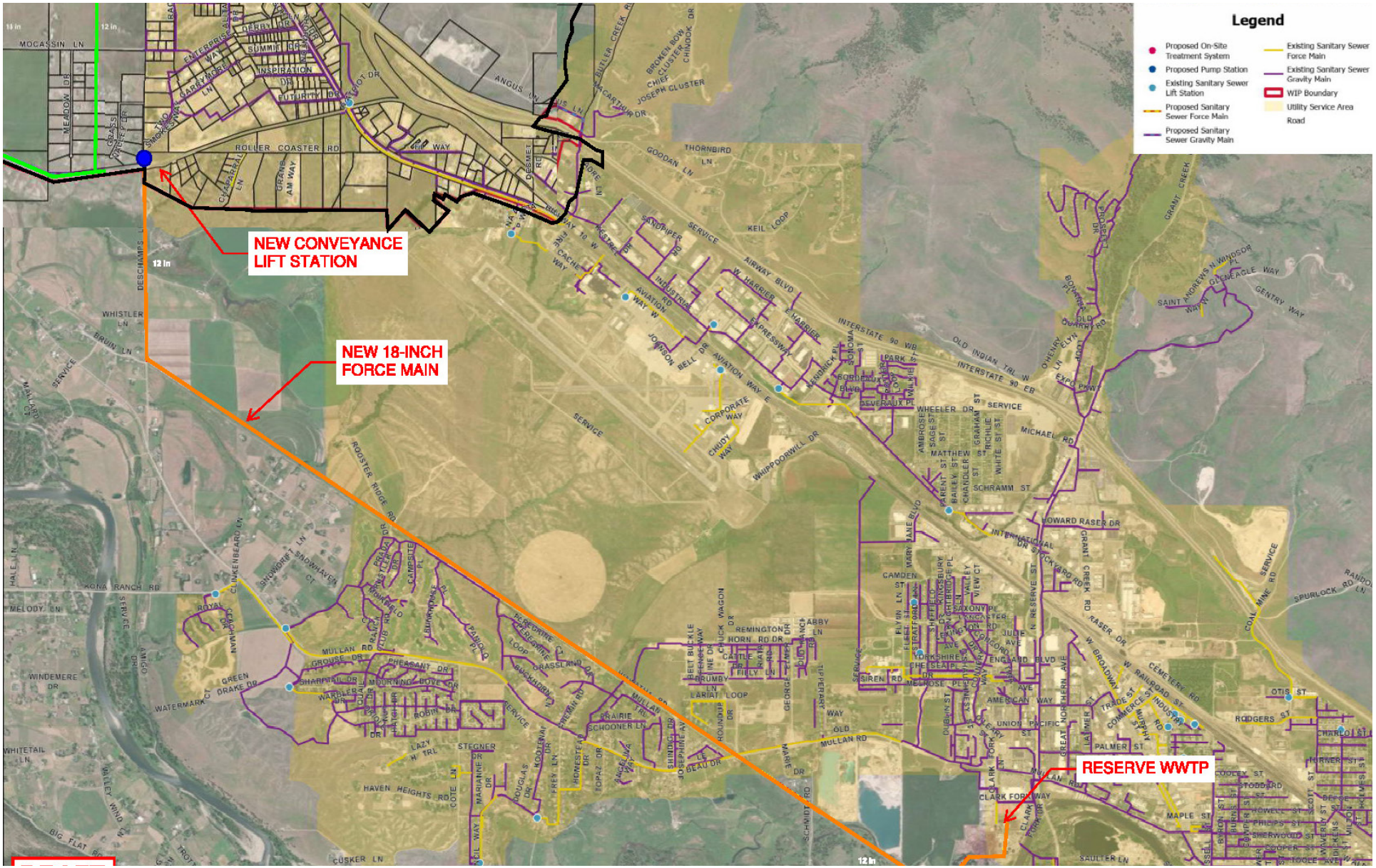


Figure 56. SS-Alt 1B Aviation Way Conveyance

Infrastructure Plan
Sewer

Recommendations
The development of a comprehensive wastewater system for the WIP area poses unique and daunting challenges. While much of the central portion of the study area is served by a long-term agreement with the City of Missoula through RSID 8489, areas on the west, east, and south of the WIP area fall outside of the RSID service boundary.

Three alternatives were evaluated, along with variants of these alternatives, to provide comprehensive wastewater services to the properties within the WIP area. While the potential for collection, treatment, and disposal of wastewater to the MLH site was investigated, there are too many unknowns for this option to be included as a recommendation. As above, it is anticipated that areas within the City of Missoula Wastewater Treatment Plant Service Area will continue to receive sanitary sewer services from the City of Missoula via the RSID including in-fill and redevelopment within the RSID boundary. For areas outside of the Treatment Plant Service Area, the following alternatives are recommended towards development of a comprehensive wastewater system at the Wye.

1. Areas outside of the City of Missoula Utility Service Area: On-site systems for collection, treatment, and disposal
It is recommended that areas located outside of the Missoula Wastewater Treatment Plant Service Area develop on-site wastewater systems to provide collection, conveyance and disposal of wastewater effluent. This would include at least the two larger areas located to the west (Sub-Area A) and the east (Sub-Area E). Because Sub Area E requires significant regional transportation and water infrastructure investment, in addition to the sewer investment before initial development can begin, it is anticipated that development in this area will not commence within the next 30 or 40 years. Detailed recommendations here focus on development of Sub Area A. As stated earlier, facilitation of near term development in Sub Area A , with the goal of initiating development towards an urban future, it is recommended that the step wise process outlined in Sewer Sub Alternative 2A is implemented; this solution will facilitate development during the early years of Wye TEDD 2 and provide a path towards creating effective increment that can be used for bonding additional phases prior to the eventual sunset of the TEDD district. Any on-site solutions should be implemented with an eye towards future expansion, combination with other areas, or otherwise work towards regional or comprehensive and master- planned systems. Efforts should be made to avoid a patchwork of small, on-site local solutions that are not connected to one another which would make formation of a wholesale solution in the future more difficult and costly.

Summary of Sewer Sub Alternative 2 A – Stepwise Progression:
Phase 0 Catalyst and Precedent Infrastructure: construct initial MBR facility capable of treatment and disposal of 150,000 gallons per day, implemented in up to three steps: beginning with 60,000 or 120,000

gallons per day capacity and incrementally expanding to 150,000 gallons per day with additional investment. It is anticipated that this initial investment will support the residential, industrial, and modest commercial development currently planned within the A0 portions of Sub Area A.

Phase 1 Extend Core Infrastructure: expand initial MBR facility from 150,000 GPD to 300,000 GPD or greater to facilitate development within A1 portions.

2. Alternate Recommendation: Sewer services to be provided through an expansion of the RSID via the City of Missoula

As stated previously, it has been assumed that the properties and Sub-Areas that are currently part of the RSID and also properties within the Missoula Wastewater Treatment Plant Service Area will continue to receive sanitary sewer services from the City of Missoula via the RSID including in-fill and redevelopment within the RSID boundary. For areas outside of the Wastewater Treatment Plant Service Area, should the City change course and opt to expand their customer base and the service boundary , it is recommended that customers within the WIP area seek wastewater services from the City of Missoula. Expansion of the RSID system will pose financial and technical challenges, political and organizational challenges, as well as publicity challenges for the City of Missoula. There will need to be major investment in collection, conveyance, and treatment upgrades for the City of Missoula to take on additional customers. However, the City already provides wastewater services to a significant portion of the WIP area. If the City has the political will and interest to expand their current service area, this choice is recommended for properties in the WIP area to obtain sewer services. The expansion of the RSID and the development of the old railroad right of way are recommended as the preferred means of conveying flows to the Reserve WWTP for treatment and disposal.

Conclusions

Development of the properties in and around the WIP area will require major investment and commitment to provide the necessary public infrastructure that is indicative of a modern planned community. However, opportunities exist and there are alternatives available for consideration. This study has sought to evaluate alternatives resulting in comprehensive water and sewer systems capable of allowing for development of the entire area.

Going forward, individual projects and development plans must be evaluated with consideration for how they fit within the overall infrastructure development plan for the Wye area. With a need for affordable housing, commercial and industrial lands, and general growth in the Missoula area, good planning and proper execution will help ensure a high quality of living and lifestyle for this new growth area of Missoula.

Infrastructure Plan
Stormwater

Stormwater infrastructure often takes a backseat to other utilities during planning, but at the Wye it is critical to achieving the desired build-out conditions and avoiding flooding and contamination of valuable water resources. The WIP area has several stormwater challenges to overcome as described in the Needs Assessment, including poor draining soils, limited access to established receiving waters, unpredictable groundwater, and inadequate existing conveyance systems. In addition, the current MS4 boundary splits the planning area making it difficult to uniformly administer water quality treatment measures.

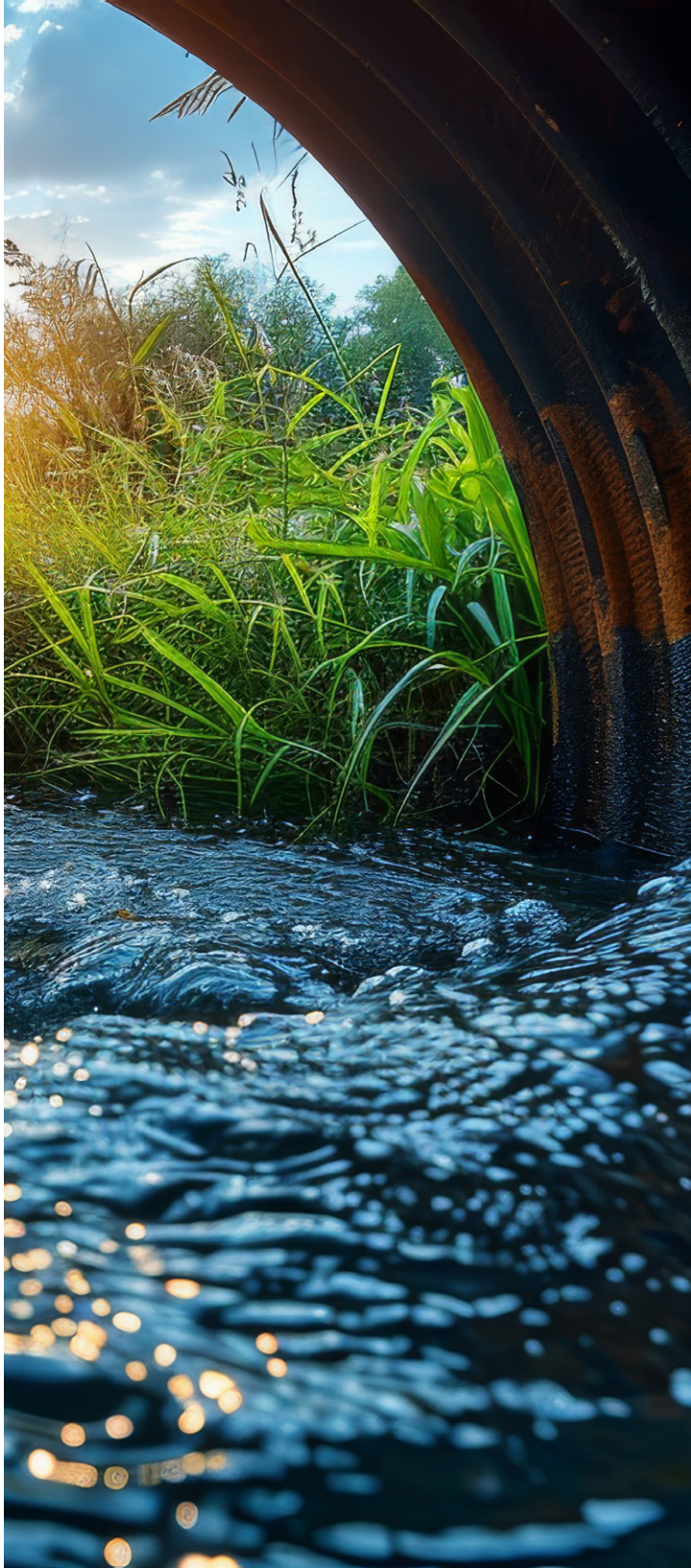
The WIP presents a unique opportunity to review the regional challenges, inventory the performance of existing facilities, and envision infrastructure that safely facilitates development, protects the environment, and establishes resilient systems for adaptation to climate change.

Recommendation Types

Stormwater recommendations were developed for the WIP area based upon the needs assessment and in consultation with staff from the County Public Works Department. The recommendations are primarily focused on fixing major issues within existing development as it is assumed that private development, guided by County design requirements, will build out all the stormwater utilities in the undeveloped areas. These recommendations fall into three categories: 1) physical infrastructure, 2) administrative measures, and 3) general recommendations and best practices.

Physical Infrastructure – These recommendations focus on physical stormwater and drainage infrastructure improvements that directly address identified deficiencies. Recommendations include both public and private improvements that benefit the community. Preserving or improving critical conveyances will alleviate flooding and erosions issues currently resulting from developed parcels discharging concentrated stormwater onto adjacent private property. Regional detention improvements would provide the level of service needed for sustainable development. Improving stormwater infrastructure in conjunction with road, water, and wastewater improvements will result in cost-savings. In particular, physical stormwater improvements should be closely coordinated with transportation improvements since road corridors serve as primary drainage arteries.

Administrative Measures – These recommendations focus on administrative measures and policies that the County may consider to help incrementally address local deficiencies in stormwater management. These measures are typically quicker and lower cost solutions that are easier to implement than some of the physical infrastructure recommendations. New local stormwater standards would allow implementation of best management practices, such as uniform water quality treatment per MS4 requirements and detention that is more appropriate for the numerous small ephemeral drainages. They also present an opportunity to incorporate climate change planning by adopting higher design storms and runoff modeling standards that are informed by climate models.



Recommendations

The stormwater management recommendations are grouped in similar development phasing as previous sections of the Plan. These include:

Phase 0. Catalyst and Precedent Infrastructure
Phase 1. Foundations of Urban Development
Phase 2. Begin Implementing Urbanization
Phase 3. Urban Development
Phase 4. Wye as an Urban Center

The following section outlines these phases and improvements.

Legend

EXISTING
- Impacted/Destroyed Drainages
- Roadside Conveyance
- Culvert

Streams
- Perennial
- Ephemeral
- Infrastructure Plan Boundary
- Near Term Development
- Parcel Boundaries

RECOMMENDED STORMWATER INFRASTRUCTURE
- Storm Drain or Culvert (Preferred Route)
- Storm Drain (Alternate Route)
- Open Channel/Roadside Ditch
- Preserve or Enhance Ephemeral Drainage
- Regional Stormwater Facility
- A — High Priority Improvement Project ID
- High Priority Improvement Project

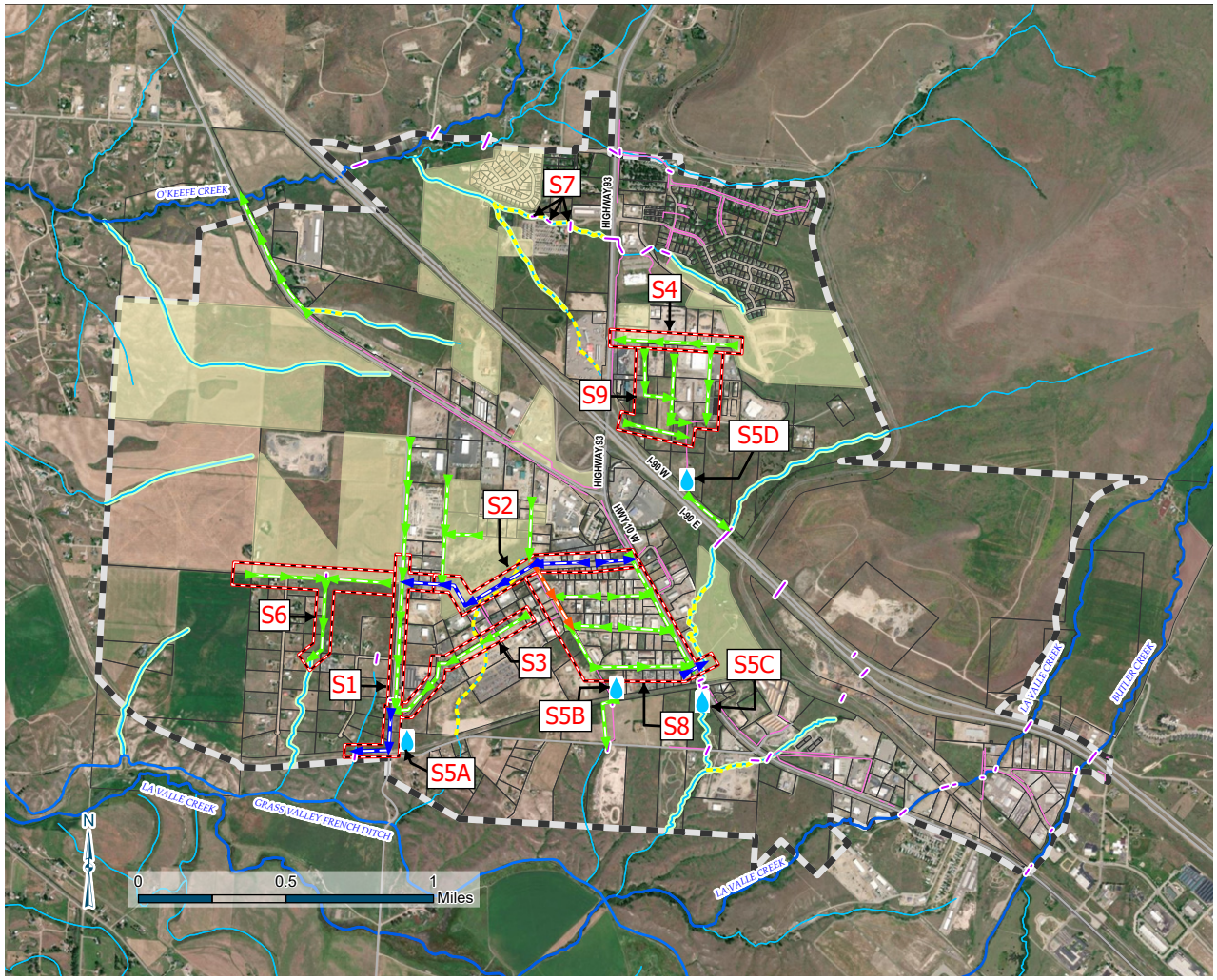


Figure 57. Stormwater Recommended Improvements

Infrastructure Plan
Stormwater

Phase	Description	Projects	Public Costs
Phase 0: Catalyst & Precedent Infrastructure	Focus on essential infrastructure needs such as outfalls, collection, detention for major drainage limitations, regulatory	S1, S5A, S6, S7	$4,724,862
Phase 1: Extend Core Infrastructure and Address Constraints	Expand on foundational elements, continue to address major outfall, collection, and detention limitations	S2, S5C	$3,637,502
Phase 2: Infrastructure Expansion for Urban Development	Consider collection improvements in urban legacy areas (south)	S3, S8	$3,793,120
Phase 3: Expand Urban Scale Infrastructure	Continue collection improvements in urban legacy areas (north)	S4, S5D, S9	$2,751,928
Phase 4: Extend Urban Infrastructure to Butler Creek and Edges	Address water quality treatment and detention deficiencies in targeted areas	S5B	$1,450,779
		Total	$16,358,191

Table 10. Summary of Stormwater Improvements

Recommended stormwater management improvements for each phase are listed in Table 10, above. The following pages include detailed descriptions of each improvement as identified in Figure 55 on page 94.

Add roadside ditch or storm drain system along Cartage Road

Physical Infrastructure Improvements

S1 **Deschamps Lane Conveyances**

This project provides a new conveyance and drainage outfall path that serves the Deschamps Lane and Moccasin Lane (east) road corridors, and would eventually serve the heart of the commercial area in combination with Project S2. Project S1 would improve roadside ditch conveyances along Deschamps Lane from Moccasin Lane to the railroad corridor where a new storm drain segment would then convey water to an outfall at an ephemeral drainage located west of Dechamps Lane (along the railroad alignment). Estimated cost: $1.7M

S2 **Wye Core Storm Drain**

Project S2 is an extension of the conveyance system proposed by Project S1. Recommendations include installing a large storm drain pipe and inlet system along Derby Drive, Enterprise Way, and Moccasin Lane that discharges to the roadside ditch system along Deschamps Lane. The storm drain route coincides with a new road corridor improvement recommended in the Transportation section of this report. It also takes advantage of an existing sewer easement along the same route, thereby coordinating, consolidating, and leveraging improvements. An alternate route for the storm drain system entails an alignment southward down Alita Drive to Inspiration Drive where it would daylight into a roadside ditch system. Project S2 is dependent upon Project S1 as a precursor. Estimated cost: $1.1M

S3 **Garrymore Lane & Two Smokes Way Ditch System**

This project improves and interconnects the roadside ditch system along Garrymore Lane and Two Smokes Way to provide a continuous drainage system that discharges to the roadside ditches along Deschamps Way and Project S1. Project S3 would require a ditch or pipe connection between Garrymore Lane and Two Smokes Way along private property but could coincide with an existing public sewer easement. New or expanded drainage easements may be required for the ditch interconnection. Estimated cost: $530K (Alt: $1.1M)

S4 **Cartage Road Drainage**

A continuous roadside ditch or a new storm drain system is proposed along Cartage Road to convey water from east to west and connect with the existing roadside ditch along Highway 93. Estimated cost: $540K (Alt: $750K)

S5 **Regional Detention & Treatment Best Management Practices (BMPs)**

This suite of projects would provide regional detention and water quality improvements to high density areas of legacy development that currently have no stormwater BMPs. The regional BMPs

Infrastructure Plan
Stormwater

would reduce runoff peak flows, protect downstream properties and drainages from flood damage, and provide water quality treatment to meet MS4 requirements.

S5A This recommended regional BMP facility is located within an under-utilized railroad right-of-way, and it would serve the Deschamps Lane corridor, and a large portion of the Wye commercial/industrial core bounded roughly between Deschamps Lane, Highway 10, the railroad, and Alita Drive. Project S5A is dependent upon the conveyance and outfall improvements of Project S1. Projects S1, S2, and S3 could all drain to Project S5A via new storm drain piping and conveyances. Property acquisition or an easement would be required to site the new facility. Estimated cost: $1.8M

S5B This regional BMP facility is located within an undeveloped private property. It would serve a developed portion of the Wye commercial/industrial core bounded roughly by Alita Drive, Highway 10, Derby Drive, and the railroad that currently has no stormwater detention or water quality treatment. The culvert under the railroad that would receive drainage from the new BMP is unverified, and the conveyance immediately downstream through private property to Roller Coaster Road may need re-routing and upsizing. Property acquisition or an easement are required to site the new facility, and conveyance improvements under the railroad and downstream to Roller Coaster Road may be necessary for functionality. Project S5B could serve as an alternative location for Project S5C. Estimated cost: $1.5M

S5C This regional BMP facility is located on undeveloped private land. Its primary purpose is to provide detention and water quality to legacy development without BMPs, including the Highway 10 corridor and existing development between Highway 10 and I-90, however it could also serve areas west of Highway 10 as an alternate location to Project S5B. This BMPs service area could be expanded even further to serve future development areas located upgradient in the watershed (north of I-90) to encourage development and diversify cost-sharing. The existing culverts just upstream of this BMP under Highway 10 are clogged and need cleaning. Property acquisition or an easement would be required to site the new facility. Estimated cost: $2.5M

S5D This regional BMP facility is located on undeveloped private land, and its primary purpose is to provide detention and water quality to legacy development without BMPs in a commercial industrial area roughly bounded by I-90, Highway 93, Cartage Rd, and Sparkler Lane. An existing detention basin currently exists at the location of Project S5D, and it has the potential to be enlarged to act as a regional facility. Roadside conveyance improvements to convey runoff to the regional BMP on Sparkler Lane, Aluminum Drive, and Truck Stop Road (described by Project S9) are critical dependent improvements. Estimated cost: $930K

Undeveloped land may hold promise for new regional stormwater facilities

S6 **Moccasin Lane Conveyances**
This project would improve the roadside ditch system along Moccasin Lane, replace the culvert under Moccasin Lane, and improve a segment of the ephemeral drainage currently located on private property to properly size and define the receiving channel. This project has good potential for a public-private partnership when adjacent near-term development occurs. Estimated cost: $880K

S7 **Jellystone Drive and Granite Peak RV Resort Culverts**
This project entails upsizing three critical private culverts that are undersized. The culvert improvements are needed to minimize flood risk to both the Granite Peak RV Resort property and downstream properties. This project has good potential for a public-private partnership. Estimated cost: $360K

S8 **Wye Core Roadside Ditches**
This project includes roadside ditch improvements to several street corridors within the Wye core commercial/industrial area, and it addresses very prevalent ponding and drainage issues along roads and on private property. Streets include Derby Drive, Summit Drive, Inspiration Drive, Futurity Drive, and Alita Drive. Roadside ditch improvements along the west side of Highway 10 are also needed to receive side street drainage and convey it southward to outfall into either the regional pond proposed by Project S5C, or directly into the ephemeral drainage located where the railroad crosses Highway 10. Estimated cost: $2.7M

S9 **Aluminum Road Area Roadside Ditches**
This project includes roadside ditch improvements to several street corridors located south of Cartage Road including Aluminum Road, Stainless Way, Sparkler Lane, and potentially Truck Stop Road. The ditch improvements would remedy pervasive ponding and convey runoff to the regional BMP discussed in Project S5D, which is a dependent improvement. Estimated cost: $1.1M

ADMINISTRATIVE MEASURES

Clarify Design Standards
A comprehensive professional review of the Public Works Manual (rev January 2018) is recommended to identify potential clarifications and improvements related to stormwater design that could help facilitate planning, streamline design/review, and promote more robust stormwater infrastructure systems. Recommendations include:

Infrastructure Plan
Stormwater

Water Quality – The Public Works Manual does not specifically contain any County-approved post-construction water quality treatment standards that satisfy MS4 requirements. It is recommended that the County adopt the Montana Post-Construction BMP Guidance Manual as the water quality BMP design standard when water quality treatment is required. Additionally, it should note that O'Keefe Creek is showing signs of impairment.

Stormwater Design Trigger – It is recommended that the trigger for drainage design and detention be simplified and clarified so that it applies to all large-scale development, regardless of site slope or type (i.e. residential, commercial, industrial). It is also recommended that the Public Works Manual fully incorporate any applicable design standards from MCA 76, Ch 4, Part 1 that apply, instead of including it by reference in Section 9.3(12) and that a standalone stormwater design chapter be developed as discussed further in (d).

Water Quality Trigger – The State's minimum requirement for MS4 areas is 1-acre of disturbance, however it is recommended that the County consider a smaller trigger, such as 10,000 SF (or smaller) of disturbance, to ensure all large-scale development projects that could create stormwater pollution are captured. Clarity is needed regarding if grading and drainage plans require water quality treatment by the Manual's reference in Section 9.3 to MCA 76, Ch 4, Part 1.

Consolidate Standards – It is recommended that MCA references be removed, and a comprehensive stormwater design chapter be added to the Public Works Manual. The applicability of the chapter to project types (i.e. subdivisions, commercial site, residential, etc.) and project scale/size should be simplified and clarified.

Soil Investigation – It is recommended that the requirement for a geotechnical investigation be clarified, including its required contents, and that a geotechnical investigation, infiltration testing, and soil profiling always be required when infiltration facilities (including dry wells) are proposed. Qualitative criteria for when stormwater infiltration facilities are allowed (or not allowed) are also recommended. The City of Missoula has adopted standards that may serve as a model.

Adequate Outfall Options

Lack of adequate stormwater outfalls is a prevalent issue in the Wye area. This has led to widespread nuisance flooding, property damage, and impediments to development. Where adequate outfalls to suitable natural conveyances or drainage systems is not available, the following potential design requirements could be considered for integration into the County Public Works Manual:

Off-site Improvements – A proposed development may be required to fix the downstream conveyance impediments to create an adequate outfall. This option may be cost-effective in some situations. Examples include upsizing culverts, improving drainages and roadside ditches, installing storm drains, and negotiating public/private drainage easements.

Higher Detention Requirements – The County's current detention standard for a development is to maintain the pre-development peak runoff peak flows during post-development conditions for the 100-year storm event. In cases where there is no adequate outfall, this standard could be increased so that the post-development 100-year storm event runoff is discharged at a more conservative 2-year or 10-year pre-development rate. Preferably, in cases where soils provide at least a minor amount of reliable infiltration, the post-development 2-year and 10-year storm event may be completely retained and infiltrated. Site-specific soil infiltration testing is highly recommended to ensure adequate infiltration rates. Note that this approach is often not as effective as directly addressing the underlying issue related to adequate outfall, especially if the lack of downstream drainage systems and associated flood risk is severe.

Preserve Natural and Ephemeral Drainages

The County Public Works Manual specifies that natural drainageways should be preserved, but there is no clear methodology or planning document to define critical natural drainageways. It is recommended that a process be developed and officially adopted in the Manual for the identification and preservation of critical drainageways, including natural and ephemeral drainages.

Additionally, it is recommended that Missoula County zoning regulations are updated to preserve drainageways to facilitate comprehensive stormwater management.

Stormwater Management Plan

Development of a comprehensive stormwater management plan is recommended for the WIP area that focuses on drainage needs at full build-out.

Infrastructure Plan
Stormwater

General Recommendations and Best Practices

Below are several recommendations and best practices to consider for stormwater management in the Wye area.

- Update zoning to preserve all ephemeral streams and natural drainageways to perpetuate historic drainage patterns and ensure drainage system as well as wildlife connectivity.
- Ensure new development and redevelopment accommodates off-site flows and discharges to suitable locations that will not cause risk or damage or downstream properties, drainageways, and conveyance infrastructure.
- Whenever feasible, upgrade drainage infrastructure through opportunistic public-private partnerships.
- Coordinate with the Montana Department of Transportation to facilitate drainage network connectivity on roadways under their jurisdiction.
- Coordinate with railways to facilitate drainage network connectivity through property in their ownership.
- Create a system to trigger on-site stormwater detention and treatment upgrades associated with major redevelopment activities.
- Perform an overhaul of the stormwater design standards contained in the County Public Works Manual.
- Create a capital improvement plan to address stormwater infrastructure deficiencies based on recommendations herein.
- Create a comprehensive GIS-based inventory of all major public and private stormwater infrastructure, assess and document its condition, and identify specific maintenance needs.
- Develop a comprehensive stormwater management plan for the WIP area to address needs at full build-out.
- Study the need for designating the floodplain at O'Keefe Creek.

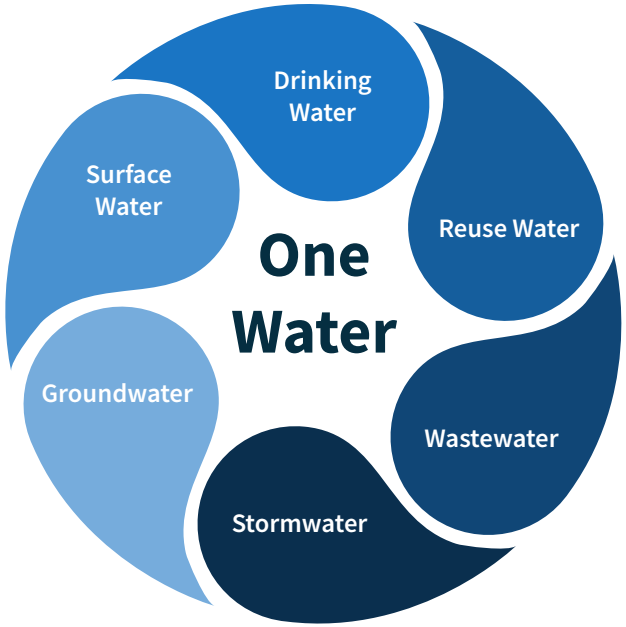


Figure 58. Interconnectedness of One Water Approach

The WIP recognizes the importance of water conservation in ensuring a sustainable water future for the area. Given the projected growth and increasing demands on water resources, a proactive and comprehensive water conservation program is essential. The conservation program will be developed as an integral component of the Wye area water, wastewater, and stormwater systems, aligning with the principles of the One Water approach to recognize the interconnectedness of all water sources and uses.

Key principles of the One Water approach include:

- **Interconnectivity:** Acknowledgement that all water is interconnected, and actions in one part of the cycle can have significant impacts on other parts.
- **Multiple Benefits:** Prioritizing solutions that offer multiple benefits, going beyond the scope of traditional stand-alone projects.
- **Holistic Solutions:** By taking a holistic view of the water cycle, the One Water approach encourages collaboration among different stakeholders, including government agencies, water utilities, businesses, and community members.
- **Efficiency and Sustainability:** Maximizing the beneficial use and reuse of water resources, promoting efficiency and sustainability.
- **Community Engagement:** Recognizing that water is a shared resource, the One Water approach emphasizes the importance of community engagement in developing and implementing water management strategies.

In alignment with the One Water approach, the WIP outlines opportunities to reduce demand on potable water supplies by reusing treated wastewater effluent for non-potable purposes and employing traditional water conservation strategies.

Reusing Treated Wastewater

Some specific considerations for the Wye area may include:

- **Fire Suppression:** Fire suppression from the perspective of industrial customers may be the most appropriate area for consideration of non-potable or wastewater effluent reuse. While these systems would require separate infrastructure from potable water systems, it would be possible to include non-potable storage tanks, pumping systems, fire sprinklers, and other fire suppression facilities that would reduce the demands placed on potable water supplies.
- **Irrigation:** New development in some areas of the Wye is seeking to implement centralized

wastewater treatment systems that will utilize MBR technology to produce high-quality effluent. Development of purple pipe networks in these areas for distribution of effluent would allow reuse for irrigation systems at residential properties, sports fields, commercial and industrial properties, and other landscape areas that would otherwise require fresh water for irrigation. A purpose pipe network can significantly reduce the demands on the potable water supplies while also allowing for the beneficial use of high-quality Class A1 reuse water as allowed under Montana DEQ rules (Montana DEQ Circular 2, Appendix B).

- **Industrial Water:** As with irrigation water needs, purple pipe networks can distribute high-quality reuse water to industrial water consumers who do not require potable water to satisfy industrial demands. Potential uses include wash-down water, cooling water, dilution water, fire protection, and other industrial uses. Any potable water use that can be replaced with non-potable water can make multiple uses of water resources and embodies the idea of One Water.

Water Conservation Strategies

The program will draw upon successful models from other communities, such as Bozeman, Montana, which has developed a robust water conservation program to address similar challenges of rapid population growth. The water conservation program will incorporate a variety of strategies to encourage efficient water use among residents and businesses. These strategies include:

- **Rebate Programs:** Financial incentives encourage the adoption of water-efficient fixtures and appliances in both residential and commercial settings. These rebates could include cash-back offers or tax incentives, targeting new construction and retrofit projects to maximize their impact on reducing overall water consumption.
- **Water Use Monitoring Tool:** A user-friendly online platform provides customers with a free tool to monitor their water usage. This tool will help residents identify potential leaks, track their water consumption patterns, and explore opportunities for savings.
- **Free Water Efficiency Products:** A program to distribute low-flow showerheads, faucet aerators, and other water-saving devices would encourage easy and immediate reductions in water use and further incentivize residents to adopt water-efficient practices in their homes.
- **Drought Management Plan:** A comprehensive drought management plan should be developed, outlining proactive measures to mitigate the impacts of drought conditions. This plan should include public education campaigns to raise awareness about drought issues and promote increased conservation practices during periods of water scarcity.
- **Water-Wise Educational Resources:** Educational materials and resources for residents and business should be developed and disseminated to promote water conservation awareness and practices. These resources should be tailored to the specific climate and landscape of the Wye area and will cover topics such as efficient irrigation practices, water-wise landscaping, and indoor water conservation tips.
- **Sprinkler System Assessments:** Free sprinkler system assessments could be offered to residents and businesses to identify inefficiencies and recommend improvements for reducing outdoor water use. This program will help ensure that irrigation systems operate efficiently, minimizing water waste while maintaining healthy lawns and gardens. Sprinkler assessments could consider opportunities for incorporating alternative water sources, such as treated wastewater effluent, for irrigation purposes, aligning with the One Water approach of maximizing beneficial reuse of water resources.

Ongoing evaluation of the water conservation program will ensure its continued effectiveness and relevance. By embracing a proactive and comprehensive approach to water conservation, grounded in the principles of the One Water approach, the WIP aims to foster a culture of responsible water use, ensuring a sustainable and thriving future for the community.

Figure 59. The One Water Cycle

Infrastructure Plan
School Placement

Increased population from planned residential development will require expansion of the existing school facilities and construction of new school facilities within the three School Districts: Frenchtown, Desmet, and Hellgate Elementary.

These three school districts provided their insights for this plan. The input from the three districts was not unanimous regarding school placement. One district indicated that placing small, 500-student schools in multiple areas would not be the most financially responsible, efficient, or effective approach to meeting the needs of future residents.

One scenario suggested that Frenchtown School District and Desmet Elementary collaboratively operate a school which would sit at the intersection of the northeast border of Desmet district and the southeast border of Frenchtown district. The primary reasons for this suggestion include:

- Desmet residential taxpayers have a significantly lower tax burden than Frenchtown taxpayers and may be more willing to pass a bond.
- Future residents at the Wye will be less interested in their young children travelling northwest to the Frenchtown K-8 campus to attend school.
- Frenchtown's K-5 campus is unable to expand or build.

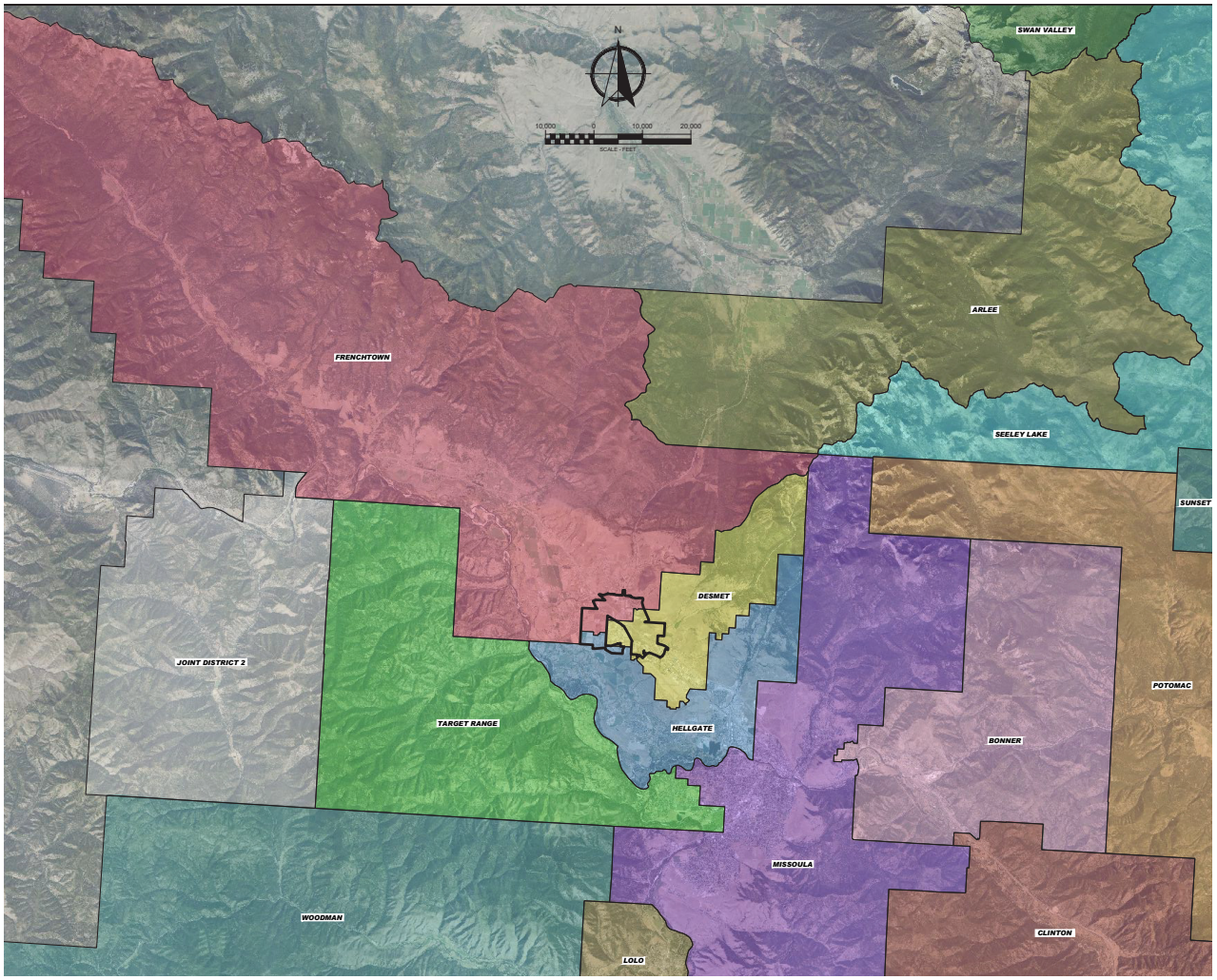


Figure 60. School Districts

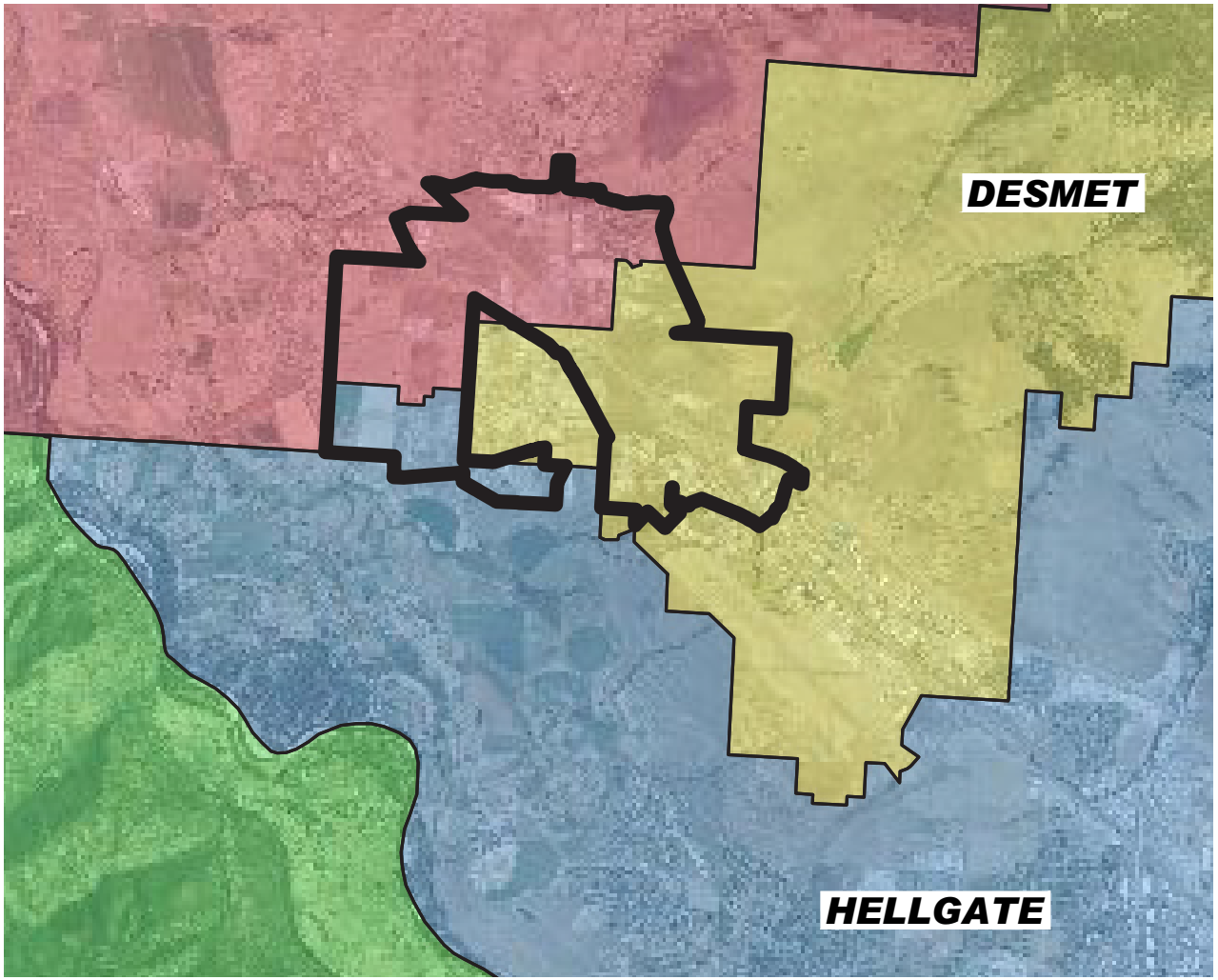


Figure 61. School Districts

- Frenchtown taxpayers last approved a building bond in 2007 to build the current middle school (finished in 2009). With the loss of Smurfit-Stone as a major tax contributor, the burden of tax application to the school district has shifted more to the local taxpayer. This creates a challenge for the school district when asking for an increase in funding.

The Superintendents of the three school districts in the WIP area considered four sites where school buildings could be built. Given the limited information about the type of homes that will be developed in order to determine which type and size of school should be built, the Superintendents suggested the buildings be designed for flexibility and that the schools could be used in K-4, K-5, 6-8, and K-8 grade configurations based on population growth and evolving needs over a period of 50 years.

Superintendents and their Boards of Trustees will need to engage in planning now to identify potential school sites and the funds they can use to purchase land and build schools over the next 10-50 years.

Infrastructure Plan

Parks Placement

The Wye area currently lacks County-owned park facilities, creating a significant gap in recreational opportunities for residents and future households. As the area continues to develop, establishing a park system from the outset will be essential to support quality of life, public health, and community identity. Quality of life is a key factor in attracting new residents and retaining current ones in the greater Missoula area. For the Wye to succeed as a potential future urban center, protecting space for amenities that foster community well-being is critical.

Parks should be located within Planned Neighborhood areas to ensure that they are easily accessible to the majority of residents and integrated into the fabric of walkable, mixed-use neighborhoods. Strategic placement within these developments will allow parks to serve as anchors for community gathering, recreation, and open space preservation.

Siting of new park facilities should consider input from Missoula County Parks, Trails, and Open Lands, and be closely aligned with the Missoula County Pathways and Trails Plan. This coordination is critical to ensure that parks not only meet neighborhood needs but also contribute to the broader County-wide recreation and connectivity framework.

Particular attention should be given to the relationship of future parks to existing and planned trail networks. The Missoula County Pathways and Trails Plan identifies regional trail connections that can serve as the backbone of a connected open space system. Where possible, neighborhood parks should be positioned to provide direct connections to these regional pathways, creating safe and convenient routes for pedestrians and cyclists. In this way, parks can function as recreational destinations and as vital nodes in the County's active transportation network, linking neighborhoods with schools, commercial areas, and regional recreation resources.

Recommendations include:

- Establish regulatory provisions and incentives to reserve sufficient space within Planned Neighborhood master plans for community and neighborhood parks, with an emphasis on walkability and centrality.
- Integrate park siting decisions with trail corridors to maximize regional connectivity.
- Pursue partnerships between the County, developers, and landowners to secure land dedications or easements for park facilities.
- Incorporate flexibility in park design to support both active recreation (fields, courts, play structures) and passive uses (paths, habitat buffers, natural open space).

Together, these strategies can establish a cohesive park and open space system for the Wye that enhances livability, supports planned growth, and connects residents to the broader Missoula County landscape.

Infrastructure Plan
Fire Protection

Recommendations for both MRFD and FRFD include expansion and/or relocation of current fire stations to increase capacity of living quarters, update for code compliance and increase number of bays for equipment storage and maintenance. Staffing recommendations for both MRFD and FRFD are estimated to be 18-21 personnel. Equipment recommendations include adding a Type-1 Fire Engine for MRFD and an Aerial Fire Engine for FRFD.

The study area is comprised almost entirely by two Targeted Economic Development Districts (TEDD). In TEDDs, excess tax revenue generated primarily by new development is diverted from taxing jurisdictions into a separate fund to pay for infrastructure costs. Tax revenue to the taxing jurisdictions remains nearly stagnant throughout the duration of the TEDD. Without increased tax revenue, both MRFD and FRFD will not be able to increase staffing, purchase new equipment or update stations as necessary to provide for the fire and life safety needs of the study area from their existing budget. Fire protection is considered infrastructure according to MCA §7-15-4283(4) and fire protection in the study area has been determined to be deficient. Thus, construction or improvement of facilities and purchase of equipment is an authorized use of Tax Increment Financing (TIF) within the two TEDDs. However, estimated infrastructure costs far exceed the estimated tax increment revenue that will be generated throughout the duration of the TEDDs, so additional funding sources is a priority.

A more in-depth analysis conducted by a fire and emergency services consultant is recommended for both districts to further analyze current conditions, plan for future needs, and identify funding sources.

Implementation Strategy

The preceding sections outlined the roadmap for the regional infrastructure needed for the Wye to fulfil its potential as envisioned by the Missoula community. Development is already occurring at a rapid pace at the Wye—one needs only to compare the last two aerial images on Google Earth to get a sense of the pace of development. Tax increment is growing in the two TEDD districts as developments come online and Missoula County leadership is taking proactive steps to implement precedent infrastructure when opportunities arise (i.e. the industrial water system in Sub Area B).

At this point, it is critical to reflect on the type of development that is occurring at the Wye and consider the importance of taxable value per acre. In a concept promoted by Strong Towns, it is crucial that areas develop in a manner that is self-sustaining per acre. That is, it is important that the tax-producing ability of the area meets or exceeds the service, operation, and maintenance costs of the infrastructure. If the taxes produced in an area are inadequate to pay for the services needed in the same area, an outside funding source will be required to maintain those services. This creates budgetary problems, which in turn spurs continued infrastructure and service deficiencies, which promotes sprawled development, and the problem continues to cycle. (Value Per Acre Analysis, Strong Towns 2018)

A majority of development on the ground is at lower density and intensity than envisioned in the Growth Policy. Because of a lack of infrastructure, notably lack of fire protection in the industrial areas south of the interstate, smaller than ideal buildings are being constructed throughout the area; resulting in development at less-than-ideal taxable values per acre. In numerous instances in the industrial Wye TEDD 1, buildings just under the threshold requiring fire sprinklers are being constructed on lots capable of serving much larger building footprints. Urbanization requires effective and efficient use of land; we are seeing land intensive uses built in many areas because of infrastructure deficiencies.

Swift action should be taken to continue to address infrastructure deficiencies where possible to facilitate development that aligns with the vision cast in the Growth Policy and increase the developed taxable value per acre. This is imperative for the Wye to achieve self-sufficiency and become an economic engine for Missoula County. If this plan is successfully implemented, the forecast development of the ~3,500 planned homes and ~1.5M square feet of planned industrial developments over the next 20 years as mentioned in the introductory sections will be facilitated and the Wye will be well on its way to achieving its potential.

Implementation Strategy

The implementation strategy includes recommended planning and regulatory actions, step wise infrastructure development based on needs during each phase of development at the Wye, and suggestions for approaches to infrastructure funding. The following sections outline each recommended implementation element in the following order:

- Recommended Planning and Regulatory Actions
- Step-wise Approach for Infrastructure Development
- Infrastructure Funding Strategies

Planning and Regulatory Actions

Implementing the recommendations of this Plan will necessitate the comprehensive review and update of several foundational documents, including Missoula County's Growth Policy, Zoning Map, and Public Works Manual. Additionally, detailed studies of the physical environment (including the aquifer) and of existing infrastructure will be needed. This section describes recommended planning and regulatory action.

The foundation of the WIP is built upon the community's vision for the future of the Wye laid out in Missoula County's Growth Policy. As the WIP has been prepared and development has progressed since 2019, we have learned more about needs and opportunities for the Wye; therefore, revisiting the 2019 Land Use Element with consideration of the infrastructure recommendations of this plan and changes at the Wye since 2019 is advised. For instance, a proposed transportation connection will link Planned Neighborhood uses in the Butler Creek Region (Sub Area E) to the Industrial Center directly to the west by crossing the rail line; this connection creates an opportunity for a cohesive residential neighborhood on either side of the tracks if the Neighborhood Residential area containing the Meadowlands subdivision were extended south over a portion of the current Industrial Center. This adjustment to the Land Use Element would also benefit access to Schools. Revisions to the Land Use Element of the Growth Policy should be coupled with amendments to the Zoning Map.

Infrastructure recommendations made within the WIP will require adjustments to current Missoula County Public Works Manual's standards and details. For instance, the recommended street sections for the Wye will require modification to the current street section details in the Public Works Manual. Public Works storm water management standards, water and sewer standards, and transportation standards should be updated to ensure that infrastructure improvements made at the individual project level will align with the regional systems outlined in the WIP. Missoula County Subdivision Regulations may need updates to align with revisions made in the Public Works Manual.

Implementation Strategy

Detailed analyses of physical systems are needed. A comprehensive aquifer study is recommended to guide future expansion of the existing and proposed public water and wastewater systems. A hydrologic and hydraulic study and model should be completed on O'Keefe Creek with the goal of establishing a regulatory floodplain over the length of the creek. Climate Ready Missoula should be consulted for guidance in planning for and including infrastructure provisions for the increasing wildfires, smoke, flooding, extreme heat, and drought resulting from climate change.

Following is a comprehensive list of recommended planning and regulatory actions:

Revisit Planning Documents

- Revisit the 2019 Land Use Element and identify areas where Land Use Designations should be updated to reflect recommendations of this plan and adapt to opportunities.
- Revisit Missoula County Pathways and Trails Plan as school and park locations are selected to ensure connectivity and cohesiveness with regional development patterns.

Update Regulatory Documents

- Update the Missoula County Public Works Manual. Recommendations made in the WIP are regional in nature and generally relate to backbone infrastructure; Public Works standards and details for local-scale street and utility infrastructure should be cohesive and complement the regional infrastructure recommendations in this plan. Infrastructure improvements made at the individual project-level should align with regional connectivity, storm water, and utility goals. Consider Wye-area specific standards and details for alignment with recommendations on transportation network, street sections, grading and drainage requirements, and regional sewer and water systems.
- Update Subdivision Regulations as needed to align with Public Works Manual revisions and to ensure individual project-level transportation and utility planning aligns with regional goals.
- Update Zoning Code and Map based upon revisions to Land Use Designations. Include provisions for interconnectivity of a multimodal transportation network, preservation of ephemeral drainages to facilitate comprehensive storm water management goals, and other considerations as appropriate.

Analyze Physical Systems

- Complete a comprehensive aquifer study or studies to guide future development of water supply and wastewater disposal.
- Complete hydrologic and hydrology studies of O'Keefe Creek; establish a regulatory floodplain.

Conduct Infrastructure Studies

- Conduct a transportation corridor study of Broadway (HWY 10) from the Wye to Russell Street, focusing on roadway configuration, access management, and transit.
- Study comprehensive stormwater management, focusing on drainage-wide needs at full buildout of the Wye.
- Create a comprehensive GIS-based inventory of all major public and private stormwater infrastructure, assess and document its condition, and identify specific maintenance needs.
- Conduct a study of the Wye Area Water System (existing system located in sub-area D). Evaluate purchase of the system by Missoula County to facilitate a comprehensive and connected publicly -owned water system for entire Wye area.
- Conduct an Intersection Control Evaluation (ICE) at the Highway 93 and the I-90 Westbound Off-Ramp intersection to determine the appropriate intersection form - such as a roundabout, signal, or other configuration; and to assess eligibility for state-administered programs such as the Highway Safety Improvement Program (HSIP) or Congestion Mitigation and Air Quality (CMAQ) funds.

These recommendations form a comprehensive planning and regulatory foundation and set the stage for successful implementation of the infrastructure improvements discussed in the next section.

Step-wise Approach for Infrastructure Development

The following section lays out a step-wise approach to regional infrastructure needs at each phase of development in the WIP, presented in table form. Recommended projects begin with infrastructure needed before dense and intense development can occur – the precedent and catalyst infrastructure – followed by sequential infrastructure expansion and enhancement according to the roadmap laid out each section of the WIP.

Implementation Strategy

Summary of Improvements by Phase

The sub-regions in Figure 60, copied from the sewer and water infrastructure section for ease of reference, provide a key for the infrastructure sub regions in the preceding table. Refer back to the sewer and water section for a description of each sub-area designation.

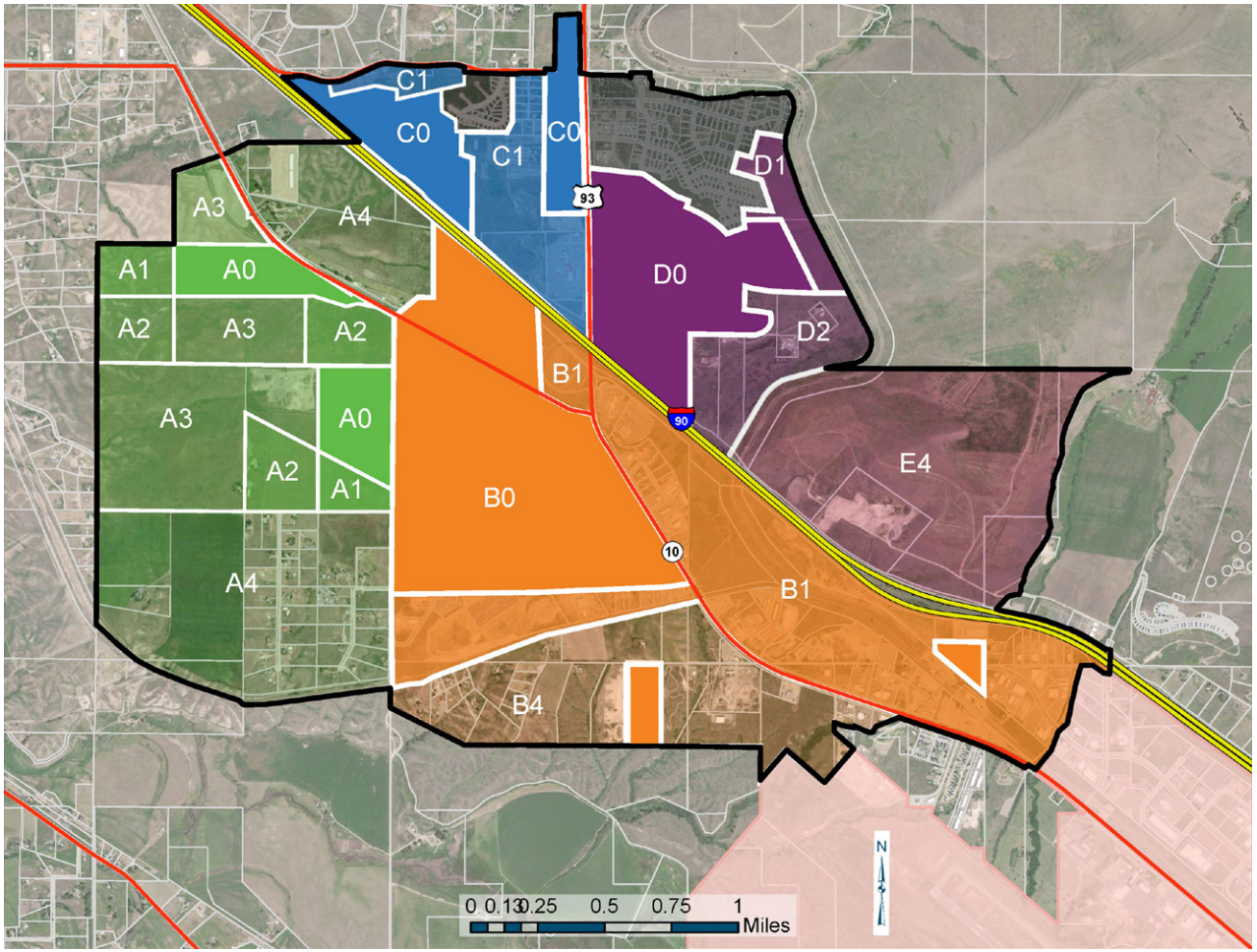


Figure 62. Sub-areas and Phasing of Development

- Interstate
- Highway
- Collector Road
- Property Lines
- Incorporated Cities and Towns
- Infrastructure Planning Area Boundary

Implementation Strategy

Summary of Improvements by Phase

Phase	Description	Sewer	Public Costs	Water	Public Costs	Transportation	Public Costs	Stormwater	Public Costs	Public Infrastructure Total
Phase 0	**Catalyst & Precedent Infrastructure:** Focus on essential infrastructure needs with goal of facilitating meaningful development; guided by: current development patterns, recent development trends, and opportunities. Address major limitations and encourage development at intensity/density in line with vision cast with Land Use Element. Initial infrastructure investment should build foundational elements, with one potential exception, infrastructure elements funded at this stage should be pieces of the larger regional puzzle; i.e. regional vs local importance.	Initial Sewer System including Primary Treatment, Mechanical Treatment, and Disposal for Planned Neighborhood Area West of Deschamps (Sub Area A) City of Missoula Lift Station Improvements (Sub Area C)	$17M	Industrial Area Water System - Supply, Storage, Pumping, and Initial Transmission (Sub Area B) Residential Area Water System West of Deschamps - Supply, Storage, Pumping, and Initial Transmission (Sub Area A) Wye Water System Transmission Main Extension (Sub Area C)	$15M	Westbound I-90 Ramp Intersection Improvements Highway 93 and Waldo Road Traffic Signal	$5M	Outfalls, Collection, & Detention for Major Drainage Limitations Regulatory	$4.75M	$42M
Phase 1	**Extend Core Infrastructure and Address Constraints:** Expand upon foundational elements in an incremental way, with some heavy lifts on the big three: Water, Sewer, and Transportation. Continue to address major limitations: build upon Water core(s): expand water supply, storage, pumping, and transmission core; expand sub-regional sewer treatment and disposal capacity; expand local branches and trunks progressively from cores; address Transportation grid major intersection improvements.	Expansion of Residential Area Collection System and Lift Stations for Planned Neighborhood Area west of Deschamps (Sub Area A)	$15M	Expand Transmission and Distribution Systems Expand Supply and Treatment Infrastructure (Sub Areas A, B, C, and D)	$20M	See Phase 1 Transportation Map in Transportation Section	$25.25M	Continue Addressing Major Outfall, Collection, & Detention Limitations	$3.65M	$63.9M
Phase 2	**Infrastructure Expansion for Urban Development:** Continue building upon foundation while considering localized improvements that facilitate and enhance urban environment. Progressive expansion of Water and Sewer; Enhance Transportation grid while continuing to focus on critical intersection improvements.	Expansion of Residential Area Collection System and Lift Stations west of Deschamps (Sub Area A) Progressive Expansion and Upgrade of Collection System and Lift Stations for Areas Served by City of Missoula (Sub Areas B, C, and D)	$25M	Progressive Expansion of Storage, Distribution, and Supply (Sub Areas A, B, C, and D)	$25M	See Phase 2 Transportation Map in Transportation Section	$66.3M	Collection Improvements in Urban Legacy Areas (south)	$3.8M	$120.1M

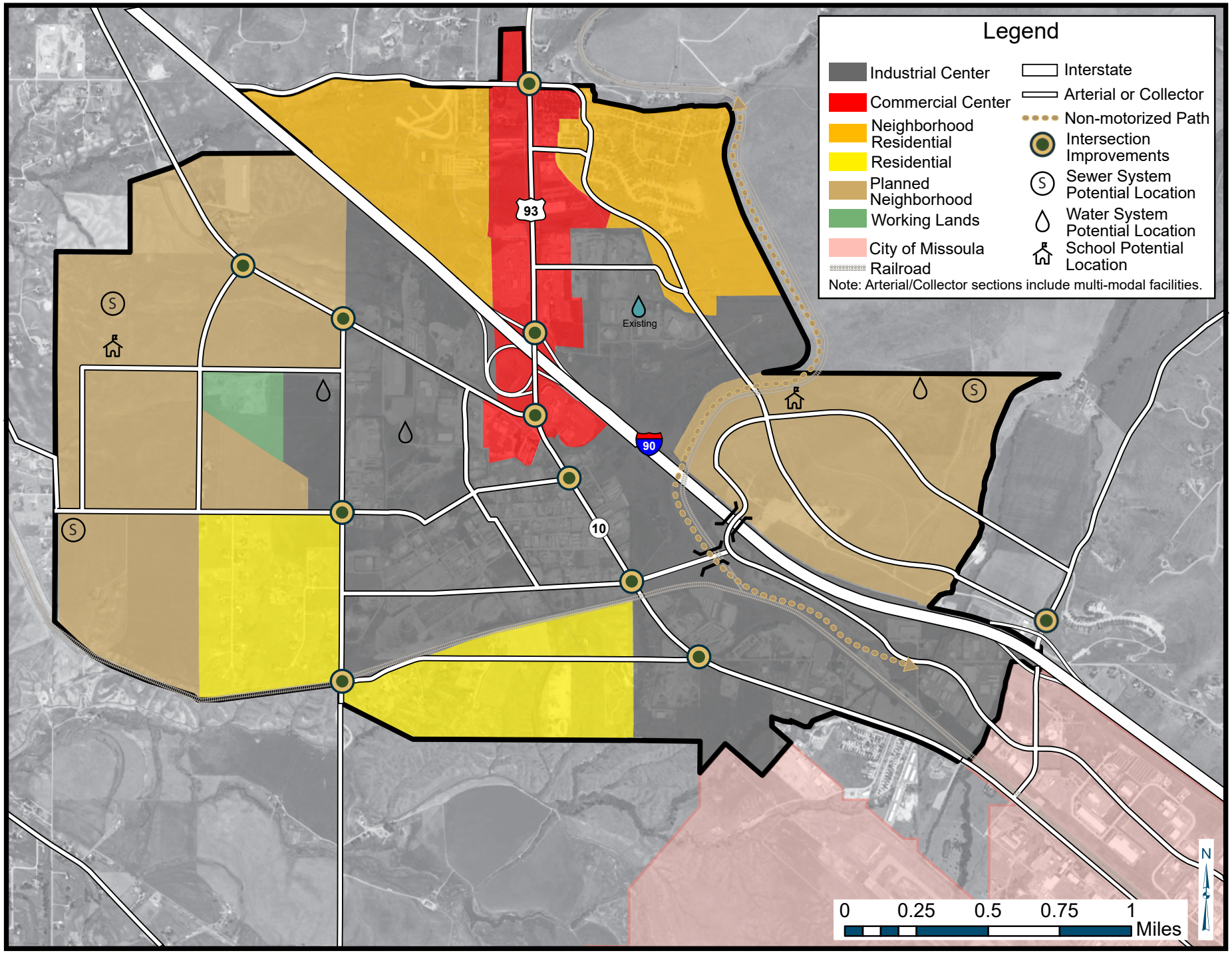
Table 11. Summary of Improvements by Phase

Note: All costs included in the WIP are in 2025 dollars

Implementation Strategy

Summary of Improvements by Phase

Phase	Description	Sewer	Public Costs	Water	Public Costs	Transportation	Public Costs	Stormwater	Public Costs	Public Infrastructure Total
Phase 3	**Expand Urban Scale Infrastructure:** Solve the regional water and sewer systems here, decommission precedent sub-regional infrastructure as appropriate. Expand transportation grid and key intersection improvements.	Construction of Regional Treatment Plant Construction and Regional Disposal along with completion of collection system and lift stations for Planned Neighborhood Area west of Deschamps (Sub Area A)	$150M	Progressive Expansion and Enhancement (Sub Areas A, B, C, and D)	$65M	See Phase 3 Transportation Map in Transportation Section	$34.4M	Collection Improvements in Urban Legacy Areas (north)	$2.8M	$252.2M
Phase 4	**Extend Urban Infrastructure to Butler Creek and Edges:** Address transportation and utility challenges for Butler Creek area and remaining undeveloped areas on edges. Continue to improve, upgrade, and expand utility and transportation infrastructure throughout study area.	Construction of Regional Treatment Plant, Regional Disposal, and Collection with Lift Station for Butler Creek Area (Sub Area E)	$120M	Butler Creek Area Water System - Supply, Storage, Pumping, and Transmission (Sub Area E) Expansion and Extension as needed in remaining study area (Sub Areas A, B, C, and D)	$50M	See Phase 4 Transportation Map in Transportation Section	$116.1M	Address Water Quality Treatment and Detention Deficiencies in Targeted Areas	$1.5M	$287.6M


Legend
Industrial Center
Commercial Center
Neighborhood Residential
Residential
Planned Neighborhood
Working Lands
City of Missoula
Railroad
Interstate
Arterial or Collector
Non-motorized Path
Intersection Improvements
Sewer System Potential Location
Water System Potential Location
School Potential Location
Note: Arterial/Collector sections include multi-modal facilities.
93
90
10
Existing
0
0.25
0.5
0.75
1
Miles
N

Implementation Strategy

Local Funding and Financing For Infrastructure

Funding for the backbone infrastructure recommended in this plan is the key challenge in implementing successful development at the Wye. Thanks to proactive leadership from Missoula County the Wye TEDD 1 and 2 TIF districts provide an excellent foundation for funding. The precedent infrastructure recommended in previous sections (Phase 0) has been carefully selected to unlock initial development with a goal of increasing available tax increment. By building out Phase 0 infrastructure, private sector development is possible. This combination of County and private investment in infrastructure and vertical development will help "implement the increment" necessary to build a critical mass for funding infrastructure beyond Phase 0.

In the early phases of this plan it will be important to focus all available public funding towards regional backbone infrastructure that addresses precedent needs. The following section describes available funding tools and lays out a path for funding precedent infrastructure.

Each funding tool has benefits and weaknesses. The intent is to layout a framework for funding packages that utilize the benefits of one tool to offset the weaknesses of another. Layering these funding tools on the infrastructure needs from the following table can create a clear vision towards a successful outcome.

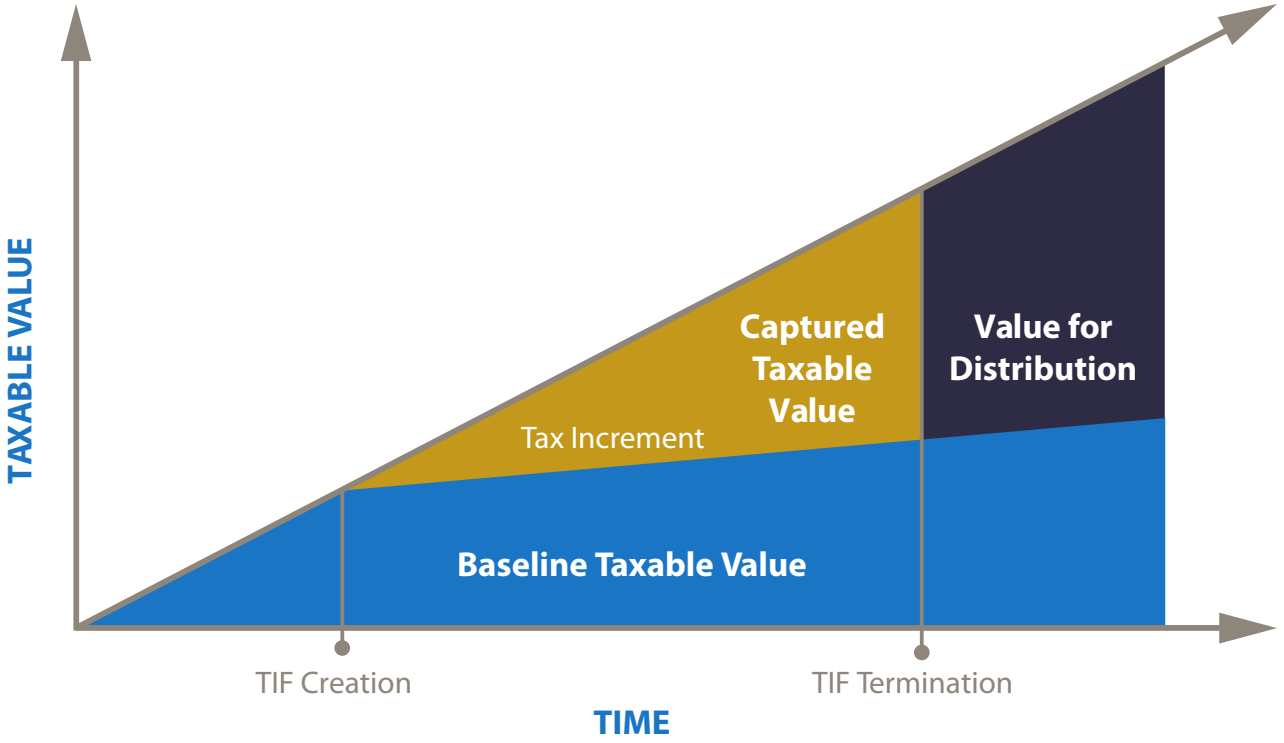


Figure 63. How Tax Increment Financing Works

Local Funding and Financing For Infrastructure

A multitude of funding tools are available to solve the puzzle. The following table provides a high-level summary. Several of the bullets in this list are abbreviated.

Source	Description	Best Used For	Currently Used?	Eligible For	Considerations/Tradeoffs	How to get Funds
Tax Increment Financing (TIF)	TIF works by designating a specific district where public infrastructure improvements or redevelopment projects are needed. When the property values in the district rise due to these improvements, the resulting increase in property tax revenue (tax increment) is captured and reinvested in the district. Target Economic Development Districts are allowed to use tax increment financing to promote the development of infrastructure to encourage the location and retention of value-adding projects in the district.	Infrastructure that enables (re)development that **increases property values and supports economic development**.	Available within TEDD 1 and TEDD 2	• Sewer • Water • Transportation • Stormwater • Fire Suppression System	Little increment is typically available for direct funding or bonding against until some development or property value increase has occurred, which makes TIF more difficult to use for major projects needed prior to development.	• Through establishment of TIF or TEDD district • Future TIF revenues can be bonded against
Special Improvement District (SID)	A legal taxing authority that can raise funds in identified special areas for specific services or infrastructure construction such as sewer lines or roads, including maintenance of some facility or service the local government provides, such street lighting. Fund are collected through assessment of the benefited properties in the district and distributed equally through an agreed-upon methodology on the basis of the area of each parcel, assessed value of the parcel, number of parcels, frontage of each parcel bordering a street, or a combination of these. SIDs have the opportunity to bond that are paid over a period of 20 years to pay for the costs of improvements or maintenance.	Infrastructure that **benefits a specific area** with a small group of property owners.	Not Established	• Sewer • Water • Transportation • Stormwater • Parks	Property owner approval requirement limits how broadly this tool can be applied and the scale of project that can realistically be funded through this mechanism.	• Establishment of a district on a defined area • Requires approval of 50% or more of the property owners in the designated area who will benefit from the improvements
Rural Special Improvement District (RSID)	Similar to a SID, it is a taxing authority that can raise funds within a designated area for specific services or construction of infrastructure, including maintenance projects. Costs for improvements and maintenance are estimated and split equally among each benefiting property, regardless of development. This cost is paid through a special assessment included in annual property taxes. Counties typically establish RSID for the construction of infrastructure or maintenance.	Targeted funding for **localized/ specific areas** public infrastructure that directly benefits the district's property owners	Not Established	• Sewer • Water • Transportation • Stormwater • Curb and Gutter • Culverts • Fire Suppression System • Parks & Trails	Property owner protest vs. property owner approval makes this easier to establish than the SID.	• Establishment of a district in a defined area. • Local government initiated or by property owners. • Property owners can protest establishment, but if less than 50% of property owners protest the district, the RSID can be established.

Table 12. Summary of Financing

Implementation Strategy

Local Funding and Financing For Infrastructure

Source	Description	Best Used For	Currently Used?	Eligible For	Considerations/Tradeoffs	How to get Funds
Services Charges (User Rates)	Service charges are imposed by a service provider or utility for the provision, maintenance, and improvement of infrastructure and public services. These charges are typically applied to services like water, sewer, electricity, transportation, and waste management.	**Maintenance and operations**, upgrades needed to comply with state or federal requirements, replacement of aging infrastructure, debt service on major infrastructure that benefits the full service area	Not Established	• Sewer • Water • Transportation • Stormwater • Toll Roads • Electricity Network • Gas Network • Broadband Network	• Typically a steady, reliable income stream that can be bonded against via a revenue bond (discussed below) • Services charges are typically linked to usage.	Requires the establishment of a utility or service provider that provides services to residents.
Impact Fees	Impact fees are one-time fees assessed on new construction projects to fund increased capacity for infrastructure or public services.	**Rapidly growing areas** where new residential, commercial, or industrial developments place additional demand on infrastructure.	Existing county fees differentiated by area and type of service. These include general government, sheriff, emergency management, public safety, parks and recreation, shared-use path.	• Sewer • Water • Transportation • Stormwater • Fire Districts • Public Safety	Fees can differentiate rates for different areas or by other development project features that correspond to differing levels of impact (e.g., smaller vs. larger homes).	• Requires setting up impact fees by development type (i.e., residential or commercial) and designating what infrastructure need it will fund. • These fees must be proportionate to the development's share of the infrastructure costs and cannot exceed the government's expenses for accommodating the development.
Exactions / Developer Contributions **Infrastructure Rebate Program notes**	Jurisdictions can require development to install infrastructure consistent with local standards needed to serve the development as a condition of approval.	On-site infrastructure and infrastructure projects needed for a specific development project.	Used for local roads, water, wastewater, stormwater	• Sewer • Water • Transportation • Stormwater	• Governed by constitutional limitations that require exactions to be related and roughly proportionate to the impact of the development. • Usually provided "in-kind" with developers constructing the infrastructure directly, to local standards. • Occasionally an "in-lieu" fee is an option for proportionate contributions to larger projects.	Required public improvements must be clearly established in local code and public works standards.

Source	Description	Best Used For	Currently Used?	Eligible For	Considerations/Tradeoffs	How to get Funds
Public Private Partnerships (PPP) & Development Agreements	Flexible tools that allow public and private parties to share costs and responsibilities of specific infrastructure needed to support or complement new development or other investments that offer both public and private benefits.	Investments that go beyond required exactions to provide additional benefit to a development or where an investment will serve a broader area and provide a public benefit beyond the development.	Not used to date	• Sewer • Water • Transportation • Stormwater • Parks & Recreational Facilities	• PPPs are useful when public funding is limited or unavailable, and private financing is needed to move project forward. Governments can attract private capital by offering incentives such as future revenue-sharing, tax benefits, or access to land. • Can be a useful tool to leverage TIF funding through deferred reimbursement • Infrastructure Rebate Programs where developers are reimbursed for regional improvements over time can be implemented.	• For new development, often captured in a development agreement that spells out each party's responsibilities • Requires a private partner or partners with access to sufficient capital to make a substantial investment and a strong market for the resulting development. • Public Benefit Companies could be considered: provide innovative financing solutions for infrastructure with unique ownership and debt opportunities.
General Obligation Bond	General Obligation (GO) bonds are voter-approved, temporary increase in property tax rates. Financing from GO bonds help fund major capital improvements. Financing is for up to 20 years for the costs of the improvement.	Funding **large-scale, long-term infrastructure** that benefits the entire community and require significant upfront capital.	Not used in this area to date	• Sewer • Water • Transportation • Stormwater • Schools • Parks & Recreational Facilities • Transit Infrastructure	• Subject to voter approval. Requires a package of projects that offer broad benefits and can garner sufficient support from voters to pass.	Requires voter approval

Implementation Strategy

Local Funding and Financing For Infrastructure

Source	Description	Best Used For	Currently Used?	Eligible For	Considerations/Tradeoffs	How to get Funds
Special Assessment Bond	Special assessment bonds are a type of bond used to finance infrastructure improvements that benefit a specific group of properties. These bonds are repaid by a special assessment levied on the properties that benefit directly from the improvements, rather than general taxes spread across all taxpayers.	Targeted funding for **localized/ specific areas** public infrastructure that directly benefits a district or subdistrict property owners.	Not used in this area to date	• Sewer • Water • Transportation	• Needs establishment of a district. • Subject a notice and protest process. If more than 50% of properties protest then the district cannot be established. • Requires considerable upfront work to determine the scope and costs of the financed project and the total amount required to be assessed. Also requires additional on-going administrative oversight for the duration of the bond term.	County establishment of special assessment bond with administrative assessment methodology.
Revenue Bond	Revenue bonds are a type of municipal bond that are secured by the revenue from the infrastructure itself, such as a user fees from water, or sewer systems.	To finance capital improvements with an existing water or sewer district.	Not established	• Sewer • Water • Toll roads	• Provides a mechanism to bond against future utility rate revenue to finance capital projects	Establish a sewer or water district that provides services.
Port Authority	Port authorities have several funding mechanisms to support the development and maintenance of critical infrastructure, including water and sewer systems, to benefit the community and promote economic development, including: • Issuing revenue bonds • User fees and leasing • Public-Private Partnerships • Grants and loans • Tax levies	Financing infrastructure within a designated area with the purpose of promoting trade, transportation, and economic development by managing key infrastructure like transportation hubs, industrial areas, and logistics operations.	Not used in this area to date	• Sewer • Water • Roads • Railway • Terminals and Logistics Hubs	• Limited funds will be available at the initial creation of the Port Authority due to deficiencies in the infrastructure in the Wye area. The port can issue revenue bonds from the infrastructure it will build, such as user fees from water, or sewer systems.	Based on the type of infrastructure the Port will build, consider the following: • Issuing revenue bonds • User fees and leasing • Public-Private Partnerships • Grants and loans • Tax levies

The following funding strategy section targets the critical infrastructure that is needed up front to support sustainable value per acre development by aligning with a specific blend of funding tools.

The five infrastructure phases identified earlier in this section enable and serve development as the Wye area grows over time. Phase 0 focuses on catalyst and precedent infrastructure necessary to facilitate new development. Initial infrastructure investment in Phase 0 is intended to be foundational, building the blocks for a regional system that will serve the greater Wye area. Phase 0 identified critical sewer, water, transportation, and stormwater infrastructure needs. Preliminary cost estimates for building out Phase 0 infrastructure needs are estimated to total roughly $40 million.

The funding strategy section aims to provide a critical path forward to prioritize specific projects in Phase 0 that can be funded with existing local sources and begin to unlock new development that can further increase revenue from an existing tax increment financing system.

Tax Increment Financing

The Wye area has two existing Targeted Economic Development Districts (TEDDs)—Wye TEDD 1 and Wye TEDD 2—which allow Missoula County to fund infrastructure such as sewer, water, transportation and life safety services to support new development using tax increment financing (TIF). Once there is sufficient, stable increment, the increment can be bonded to fund infrastructure capital projects that will be repaid by the tax increment generated over time. With a couple notable exceptions, TIF can only be used to fund projects within the TEDD where the increment is generated.

Estimated Tax Increment

Missoula County estimated near-term future tax increment revenues for each of the TEDDs based on anticipated development, typical property valuations and trends, and current mill rates.

- Wye TEDD 1 was created in 2020. Revenue is being generated from the increment, providing the County with a few years of data and the ability to budget for use of the increment. Growth has been moderate because of the area's infrastructure limitations. Forecasts build on these first years of available data and do not assume substantial near-term development prior to additional infrastructure investments. Because the TEDD is still fairly new, most revenues are not committed yet, aside from small amounts to cover administrative costs.
- Wye TEDD 2 was created in 2023, which is the base year for calculating increment (meaning that increases in property values after 2023 will generate increment). Winter of 2024 is the first assessment since the establishment of the district. Forecasts for Wye TEDD 2 are based on anticipated developments that are already in the pipeline. Because some of this area has existing infrastructure, Wye TEDD 2 may see substantial increment growth prior to additional significant public infrastructure investment.

Missoula County has estimated bonding potential based on the forecast increments, bonding requirements (including a requirement to have at least one year's worth of bond payments available in reserve prior to issuing the bond), and input from Bond council. The County indicated that since there are few other demands on the increment at present, maximizing the bond amounts and committing as much of the increment as possible to bond payments may be appropriate in the early years. The estimated revenues and near-term bonding potential for each TEDD are summarized below.

If development continues as projected, Wye TEDD 1 will have available tax increment revenue of about $916,000 annually by 2027, while Wye TEDD 2 will have roughly $1.4 million. The County's analysis and discussions with Bond council suggest that this amount of tax increment, Wye TEDD 1 can support a bond for about $7 million in the near term, while Wye TEDD 2 could support a bond of up to $11 million in the next several years. These bonding estimates assumes that each bond will be a 20-year term, with an interest rate of 5.00% and with bi-annual payments.

Developer Contributions/Exactions

Developers in the Wye will be expected to build local infrastructure to serve their projects. In addition, if no other funding strategies are implemented, they would be required to construct regional water and wastewater systems needed to adequately serve development; however, in this case, development at densities and intensities envisioned in the Growth Policy will most likely

Implementation Strategy

Existing Funding Sources and Financing Mechanisms

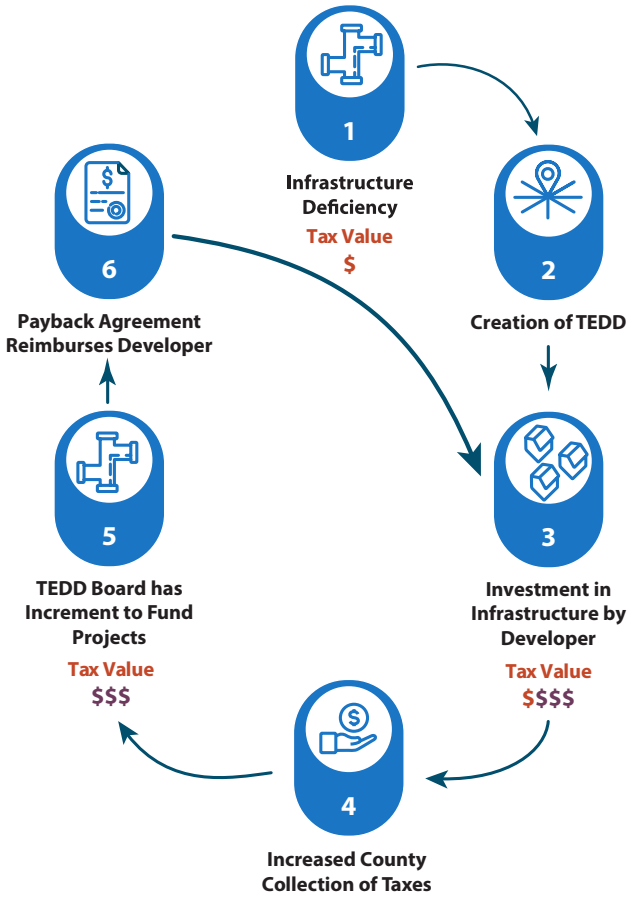


Figure 64. Reimbursement of Capital Investment by Developer Through TEDD

be inhibited because of intense capital requirements needed to construct both local and regional infrastructure. The intent of TEDD legislation in Montana is to enable the TIF funding mechanism for areas with deficient regional infrastructure; with the goal of leveling the playing field for areas where dense and intense growth is desirable for communities, like the Wye area. Developer contributions will be required for local infrastructure (local streets, distribution mains, service lines, etc…); regional funding solutions are needed for the regional infrastructure components.

Public-Private Partnership (PPP) and Tax Increment Financing Combination

The state legislature established TEDD Tax Increment Financing districts to facilitate investments that support planned growth that will increase the tax base. The larger tax base can then both repay the investments and better support the cost of providing services and operating and maintaining infrastructure. However, the increment can build slowly, and the amount available early in the life of the district is often insufficient to cover the cost of larger regional infrastructure projects that would facilitate increment-generating development. This can create a “chicken and egg” dilemma: lack of development limits the ability to fund infrastructure, while lack of infrastructure limits the ability to develop.

PPPs can play an important role in overcoming these challenges when private developers are in a position to assist with early investments. PPPs can be structured where private investors front the costs for critical infrastructure development with the agreement that they will be reimbursed to an agreed-upon extent using revenues generated from TIF. In this model, the initial private investment accelerates the timeline for project delivery, enabling development to proceed as opportunity presents itself, without missing windows of opportunity while waiting for increment to accumulate. Over time, as the tax increment grows as a result of development-caused property value increases, the TIF district uses these additional funds to reimburse the private investors. This approach benefits both the public sector, which avoids large upfront expenditures and the risk of issuing bonds, and the private sector, which gets paid back for its initial investment that would have been completed, although at a lesser extent, for their development regardless of the potential for reimbursement. This is a strategic risk-sharing strategy where private developers or investors take on the initial financial burden, and own the risk for developing the increment, while the public sector ensures long-term infrastructure funding through the predictable revenue stream generated by the TIF. The key to this structure is ensuring that the TIF district captures enough increment over time to cover the repayment obligations while also supporting ongoing public services. This approach also relies on developers that are well-capitalized, willing to take on a larger up-front risk, and planning to develop at a scale that justifies making a substantial initial investment in infrastructure.

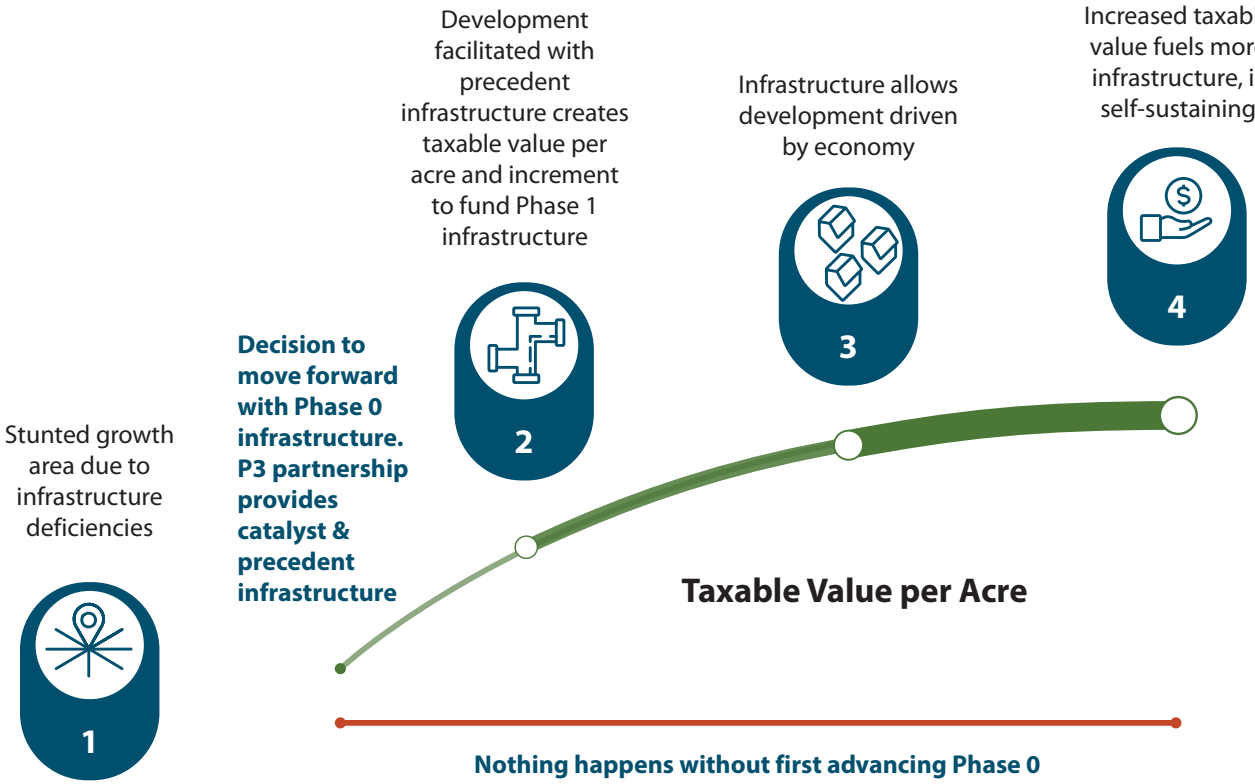


Figure 65. Phase 0 development required for funding future phases

This section outlines the crucial Phase 0 projects that require immediate funding or financing from the County to establish the foundational elements of a regional infrastructure system. These projects are vital to support new development in the Wye area and foster sustainable growth. The following section steps through suggested funding strategies for each component of Phase 0 infrastructure. Investment in Phase 0 infrastructure is critical to initiating this infrastructure plan.

Funding for Phase 0 Infrastructure

Key Issue - Water and Sewer

Water and Sewer infrastructure is a key precedent infrastructure component for portions of the Wye area, particularly Sub-Areas A and B. For Sub-Area B, industrial fire protection is needed to facilitate more intense development on the remaining undeveloped industrial lands. For Sub-Area A, both sewer are water infrastructure is needed before any meaningful development can begin.

Phase 0 catalyst and precedent water infrastructure, needed for industrial and residential development in Sub Areas A and B, consists of supply, storage, pumping station and transmission for both sub-areas. Thanks to proactive leadership on the parts of Missoula County and the private sector, construction of the initial components of a water system capable of providing fire protection for industrial development in Sub-Area B is already underway, including a 480,000-gallon storage tank, booster pump station, water supply, and initial segments of regional transmission mains. This initial water system is being funded through a combination of increment from Wye TEDD 1 and private investment. The storage and

pumping facilities included in this initial system is adequate to serve initial residential and industrial development in Sub-Area A as well.

Sub-Area A, which is largely undeveloped, represents an excellent opportunity for Missoula County to facilitate initial urban scale residential and commercial development in the early stages of this plan. Advancing sewer infrastructure in this sub-area, to leverage the water infrastructure investments that have been made in Sub-Area B, provides a best path towards creating effective increment in the early years of Wye TEDD 2 that can be used for bonding additional phases of development prior to the eventual sunset of this TEDD district.

With every year that passes, the opportunity to capture tax increment diminishes. This lost value directly impacts the district's ability to generate the funding needed to finance the substantial portfolio of infrastructure projects envisioned within Wye 2 TEDD. Establishing sewer service in Sub Area A is therefore both an immediate priority and a time-sensitive investment opportunity to secure the district's long-term fiscal success.

A coordinated funding strategy is required to advance the Sub Area A sewer system early in the Wye 2 TEDD's implementation timeline. The approach must balance near-term development readiness with long-term fiscal sustainability, allowing infrastructure to be expanded as increment becomes available.

The phased initial implementation of the membrane bioreactor (MBR) system, as outlined previously in Sewer Sub-alternate 2A, provides this flexibility. Initial capacity can be constructed to serve the first phases of residential and industrial development, with additional capacity added as growth continues. This phased approach reduces upfront costs while maintaining the ability to expand to full build-out as demand increases.

To fund the initial investment, a public-private partnership (PPP) structure is recommended. Interim debt financing could be secured through a special assessment on properties within Sub-Area A and a contribution of available tax increment. Loan programs like the EPA's Water Infrastructure Finance and Innovation Act (WIFIA) program should be explored.

In the scenario described in the previous paragraph, as residential and industrial development proceeds, tax increment revenue would gradually replace the assessment as the repayment source. Once sufficient increment beyond the original debt service is available, the district could pursue additional debt financing to expand the sewer system and fund subsequent expansion and extension of the water system improvements being built currently.

This funding approach establishes a self-reinforcing cycle—early investment in sewer infrastructure enables development, which generates taxable value, which in turn supports continued reinvestment. Increment generated by the Phase 0 improvement could provide funding to support the planned Phase 1 expansion and extension of the initial systems.

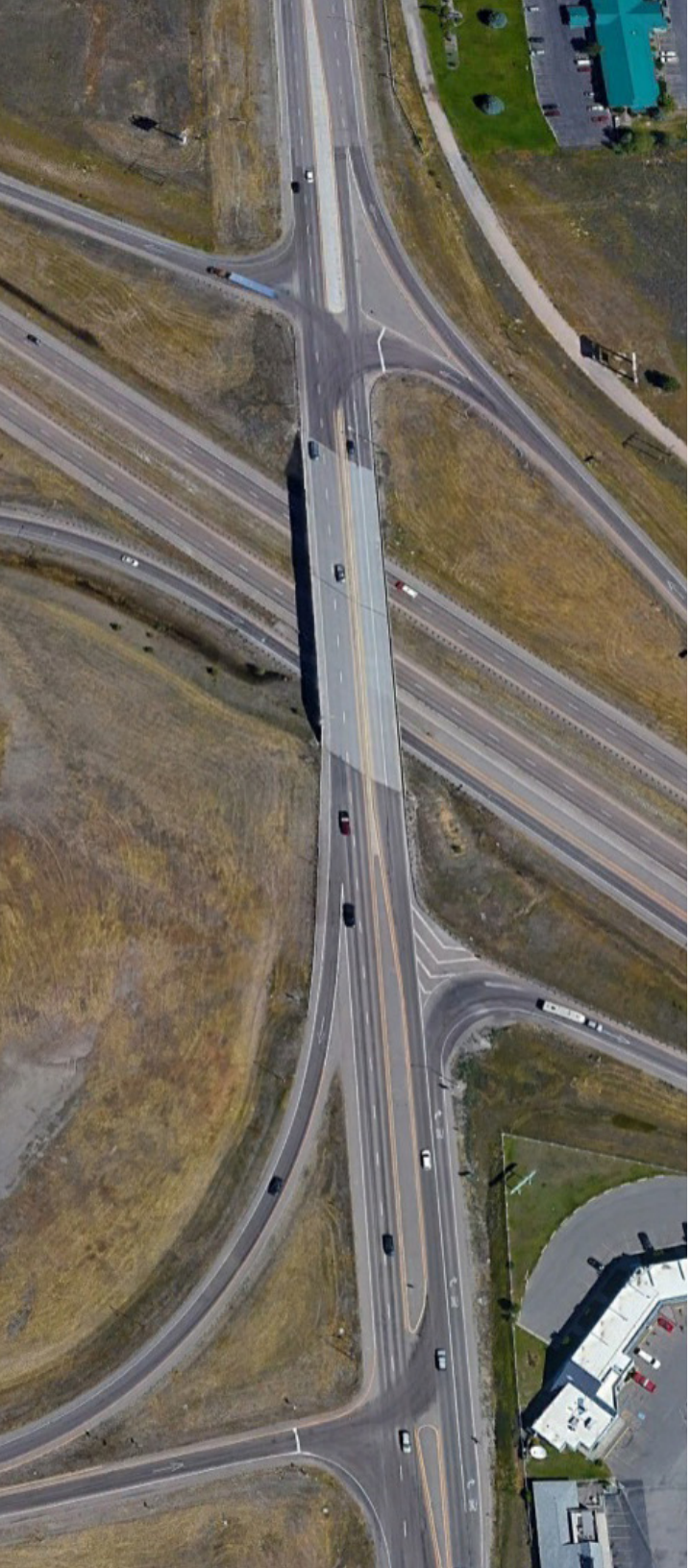
Sewer and Water Impact Fees should be considered for properties not included in initial assessment to assist with financing the subsequent needs arising during Phase 1, the County can establish an impact fee across the entire Wye area to help pay for some of the remaining costs. Additional state and federal funding sources, as outlined in the following section should be explored for expansion, and potential debt retirement for the initial water and sewer systems.

Key Issue - Transportation

The Wye area needs multiple roadway, intersection, and street reconstruction improvements to facilitate access to undeveloped land and to improve freight and residential traffic in and out of the area. Phase 0 includes two transportation projects, both are necessary to allow development to continue across the entirety of the Wye Area.

- Sub Area A and B require improvements to the intersection at the west bound approach of the Highway 93 and I-90 and interchange. This improvement is critical in the early stages of the plan.
- Sub Area C and D require a traffic signal at Hwy 93 and Waldo Road to facilitate additional traffic flow in and out of the residential areas.

Funding for Phase 0 Transportation improvements should consider a combination of TEDD financing, private developer contribution, and potential State funding. Both Phase 0 transportation projects are



needed early on but can be built within a few years after development has occurred (vs. needing to be built prior to development like water and sewer improvements.

For the Highway 93 and I-90 Westbound Off-Ramp intersection in particular, coordination with MDT will be essential to identify funding sources. Because the I-90 and Highway 10 interchange serves the industrial areas of Wye TEDD 1, A TIF bond using increment generated within this district should also be considered.

For coordination with MDT, an Intersection Control Evaluation (ICE) should be performed at this location to determine the appropriate intersection form - such as a roundabout, signal, or other configuration; and to assess eligibility for state-administered programs such as the Highway Safety Improvement Program (HSIP) or Congestion Mitigation and Air Quality (CMAQ) funds. Additional options may include the Surface Transportation Block Grant (STBG) program through MDT's Primary or Urban allocations, or state-funded safety or operational improvements. State-only funds could also serve as a local match for future federal discretionary grants such as RAISE or Safe Streets and Roads for All (SS4A), helping advance early intersection improvements ahead of TEDD revenue availability.

Transportation Impact Fees should be considered to assist with financing the subsequent transportation needs arising during Phase 1. Additional state and federal funding sources, as outlined in the following section should be explored for the remaining financial gap.

Key Issue – Stormwater

Stormwater infrastructure often takes a backseat to other utilities during planning, but at the Wye it is critical to achieving the desired build-out conditions and avoiding flooding and contamination of valuable water resources. Similar to Phase 0 transportation projects, stormwater improvements are needed early on but can be built within a few years after development has occurred (vs. needing to be built prior to development like water and sewer improvements.

Grant funding should be pursued for Phase 0 stormwater improvements. Missoula County should plan ahead to be prepared to target grant cycles and set aside funding for local match requirements. Take advantage of planning grant cycles to develop PER's that are often required for construction grants. Where possible, incorporate stormwater improvements into other major projects, such as road reconstruction.

Grant and Loan Programs

In addition to local funding mechanisms, a variety of state and federal grant and loan programs are available to support the planning, design, and construction of public water, wastewater, stormwater, and transportation infrastructure in the Wye area. These programs are frequently combined to create an overall funding package that leverages external resources and minimizes local debt.

Implementation Strategy
Near Term Critical Path Projects

State Programs

Montana administers a range of programs designed to assist local governments, special districts, and tribal entities in developing critical public infrastructure. These programs are intended to improve community health and safety, promote sustainable growth, enhance economic opportunity, and improve mobility and resilience. Commonly used programs include:

- Montana Coal Endowment Program (MCEP)
- Renewable Resource Grant and Loan Program (RRGL)
- State Revolving Fund (SRF)
- Community Development Block Grant (CDBG)
- Big Sky Economic Development Trust Fund (BSTF)
- INTERCAP Loan Program (Board of Investments)
- Reclamation and Development Grants Program (RDGP)
- Coal Board Grant Program
- State-Local Infrastructure Partnership Act (SLIPA)
- Transportation Alternatives (TA) Program, Montana Department of Transportation (MDT)

These programs collectively support a wide range of project types—from preliminary engineering and planning to construction of water, wastewater, stormwater, and solid waste systems. Many offer competitive grants that can be paired with low-interest loans to meet match requirements or reduce reliance on local bonding. Funding levels, match ratios, and eligibility criteria vary across programs and are typically reviewed on a biennial cycle aligned with state legislative sessions.

Federal infrastructure programs are designed to complement state and local efforts by providing long-term, low-interest loans and grants for public facilities, utilities, and community resilience. These programs are generally administered through federal agencies in coordination with state partners, and are especially beneficial for large or multi-phase projects. Key programs include:

- U.S. Department of Agriculture (USDA) – Water and Waste Disposal Loan and Grant Program
- U.S. Economic Development Administration (EDA) – Public Works and Economic Adjustment Assistance
- U.S. Environmental Protection Agency (EPA) – Water Infrastructure Finance and Innovation Act (WIFIA)
- U.S. Army Corps of Engineers (USACE) – Section 595 Rural Montana Infrastructure Program
- Federal Emergency Management Agency (FEMA) – Hazard Mitigation and Resilience Grants (HMGP, BRIC, FMA)
- U.S. Indian Health Service (IHS) – Sanitation Facilities Construction Program
- U.S. Department of Transportation (USDOT) – Transportation Infrastructure Finance and Innovation Act (TIFIA) and Rural Project Initiative (RPI)
- USDOT – RAISE (Rebuilding American Infrastructure with Sustainability and Equity) Grant Program

Federal programs typically focus on major infrastructure investments, rural utility systems, and resilience improvements. They often require a local match that can be met through state programs such as MCEP, RRGL, or SRF. These sources can be particularly valuable for large, multi-phase projects or those tied to job creation, public health, or environmental protection outcomes.

Together, these state and federal programs form a comprehensive funding framework that can be combined with local tools such as TEDD revenue, special assessments, and public-private partnerships. However, available programs and funding levels are subject to change based on state and federal legislative priorities, appropriations, and agency funding cycles. The list provided here should be considered a general reference and not an exhaustive or guaranteed inventory of all potential funding opportunities..

Port Authority

A port authority can support the development and maintenance of critical infrastructure, such as transportation, water, and sewer, through various means that include the following:

- **Issuing Revenue Bonds.** The Port authority can issue revenue bonds to finance infrastructure projects like water and sewer systems. The bonds are paid back through revenues generated from fees or leases associated with the infrastructure.
- **User Fees and Leasing.** The port can charge user fees for the services it manages, such as water and sewer systems. Additionally, leasing land or facilities under its control can generate revenue.
- **PPP.** The authority can enter into contracts and partnerships with private entities to jointly finance and manage infrastructure developments.
- **Grants and Loans.** The port authority may seek grants or loans from state or federal programs to support the development of infrastructure such as water and sewer systems.
- **Tax Levies.** In certain cases, a port authority may be granted the power to levy taxes for public purposes, including infrastructure development.

The establishment of a port authority in the Wye area could further help bridge the gap in funding for infrastructure needs. The various means that the port authority has to fund infrastructure will be crucial in supporting this development .

Conclusion

Through the comprehensive planning efforts of the Growth Policy and Land Use Element, the majority of stakeholders identified the Wye is Missoula County's area for urban expansion, leading to the development of the WIP.

The Wye is currently a job and economic center. To develop into the urban area envisioned by the Missoula community, dense, intense, and efficient land uses are needed. Effective infrastructure is the key to urban land development. Urban scale development of the land that remains to be developed (or redeveloped) is required to generate a taxable value per acre that is sufficient to be self-sustaining.

Missoula County leadership has been proactive in seizing the opportunity for the Wye. Because of strong leadership from effective Commissioners, the Wye exists as a solid base for urbanization and is set up for success through the two Targeted Economic Development Districts. Missoula County has a head start towards urbanization in that Wye TEDD 1 is already generating significant increment.

This Infrastructure Plan is the roadmap for the Wye to successfully support our community. By implementing the plan, the Wye can drive Missoula's future economic and community health. Nearly 50-years ago Missoula County saw the importance of the Wye when the Wye/O'Keefe Area Plan was adopted in the late 1970's. We can now imagine 50 years into the future and envision an inspiring future.