

NORTH RESERVE - SCOTT STREET COMPLETE TRANSPORTATION FUTURE

TECHNICAL ASSISTANCE REPORT
June 2023



REGIONALLY-DIRECTED TECHNICAL ASSISTANCE

This project was performed through regionally-directed technical assistance supported by the U.S. Environmental Protection Agency Office of Brownfields and Land Revitalization (OBLR) and U.S. EPA Region 8.

The project was supported by the dedicated staff of the City of Missoula. Successful brownfields reuse and redevelopment often depends on early consideration of the range of potential future uses for each brownfields site. Local community priorities, market conditions, infrastructure availability, environmental contamination, public health issues, and local ordinances shape brownfield site reuse opportunities. Having this Brownfields Revitalization Plan grounded in these local conditions will directly influence how that site is characterized, assessed, and cleaned up.

TA Provider:



Consultant Team:



TA Recipient:

City of Missoula

Site Address:

Area bounded by Scott Street, Interstate 90, North Reserve Street, and the Montana Rail Link railyard, Missoula, MT

Previous U.S. EPA Brownfield Grant:

FY2018 U.S. EPA Brownfields Assessment Grant



Disclaimer:

This report reflects the Consultant Team's analysis of data obtained from the **City of Missoula** as well as other external publicly accessible data sources. The report was developed for the City of Missoula under contract EP-W-12-020 with the U.S. Environmental Protection Agency's Office of Brownfields and Land Revitalization. This is a contractor-prepared report and does not represent EPA's position. Any publication, distribution, or use of this report beyond the stated purpose is outside of the Consultant Team's control.

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Introduction

The U.S. Environmental Protection Agency's (U.S. EPA) Office of Brownfields and Land Revitalization (OBLR) and U.S. EPA Region 8 provided technical assistance to the City of Missoula in advancing its brownfields redevelopment goals for the North Reserve-Scott Street area, specifically related to transportation network improvements needed to support recent and pending reinvestment. This document is intended to serve as a resource for the City of Missoula leadership, Missoula County, and other stakeholders to evaluate potential ways to advance focused transportation improvement concepts developed through previous planning activities.

PROJECT AREA

The North Reserve-Scott Street study area is an approximately 1.3-square-mile area bounded by Scott Street to the east, North Reserve Street to the west, the Montana Rail Link railyard to the south, and I-90 to the north (See Figure 1). The study area includes land both within City limits and land outside the City that is governed by Missoula County. The area is very close in proximity to the downtown and surrounding areas that have experienced significant development, yet the area has historically suffered from a lack of investment.

With the creation of the North Reserve-Scott Street Urban Renewal District (NRSS URD) in 2014, which corresponds to the study area of this report, there was a renewed interest in investment and development in the area. The 2016 North Reserve-Scott Street (NRSS) Master Plan (See Figure 2) was prepared as community-driven planning effort to vision the future development and investment in the area, including extensive potential transportation system improvements (See Figure 3). Since 2016, the NRSS study area has been experiencing a significant amount of new development investment, with hundreds of new residential units developed or planned in the area (See Figure 4).

SUMMARY OF THE BROWNFIELDS BACKGROUND & STATUS

There are several large brownfield properties located within the study area boundary that have a long history of industrial uses dating back to the early twentieth century, ranging from lumber mills, chemical plants, and fuel depots. There are also several large active industrial businesses that are anticipated to continue operation well into the future and would benefit from the transportation improvements discussed in this report should they be implemented (See Figure 5).

In 2016, a Regional Environmental Site Assessment (ESA) was completed by WGM Group, Inc. for the Missoula Redevelopment Agency (MRA) “to provide a general understanding of environmental factors and conditions affecting or potentially affecting the future development and growth” of the NRSS. The 2016 ESA identified several vacant industrial brownfield properties associated with the North Reserve-Scott Street Master Plan. Brownfield properties of note include the former Missouri White Pine Sash Facility, the former LS Jensen Construction sand and gravel mining operation, and a former Class III landfill.

FORMER MISSOULA WHITE PINE SASH FACILITY

The Missoula White Pine Sash (MWPS) facility was a former lumber mill and wood treatment operation located at approximately 1301-1705 Scott Street (Missoula County parcels 0003510502, 0422214002, 0422214003, 0003609004, 0003609106, 0003608908, and 0001447502), at the southeast corner of the study area. The facility operated from approximately 1905 to 1996 and has been under environmental regulatory supervision since 1980, as a listed facility in the State Superfund Program. Environmental concerns

include groundwater contamination at the south end of the site where the bulk of wood processing and treatment took place, leaking underground storage tanks (LUSTs), and release of hazardous materials associated with wood treatment and disposal of wood processing byproducts. The site is now being targeted for new mixed-use development, a consolidated public works facility for the City of Missoula, and an extension of Turner Street to better facilitate truck traffic through the area.

FORMER LS JENSEN CONSTRUCTION SAND AND GRAVEL MINE

This former sand and gravel mine at the end of Howard Raser Drive (approximately 3700 Howard Raser Drive; Missoula County parcels 0418005001, 0417219001, 0001705607, 0422040002, 0421334001, and 0421334002) was closed around 2015, when final reclamation of the facility was approved by the Montana Department of Environmental Quality (DEQ). The site is now home to the headquarters of Consumer Direct, a home healthcare company. Other than the reclamation of the opencut mine, there are no environmental concerns associated with the site.

FORMER CLASS III LANDFILL

Located at approximately 1335 Rodgers Street, between Rodgers and Otis streets (Missoula County parcels 0005908370, 0000316300, 0006172802, and 0005856592), this former landfill for construction waste closed in 2003 and is now owned by the City of Missoula. The 2016 ESA noted that the nature of the wastes allowed in the landfill do not pose significant environmental concerns but that the decomposition of the wood waste may have produced methane in the subsurface, warranting further investigation if development is to take place. The site is currently surrounded by new residential development and will be adjacent to a new city park next to the Resurrection Cemetery. A Phase II ESA was recently completed for this site and, according to a May 9, 2022 press release from the Montana DEQ, this site is now cleared for redevelopment by the agency.

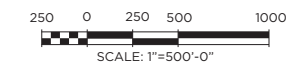
OTHER CONSIDERATIONS

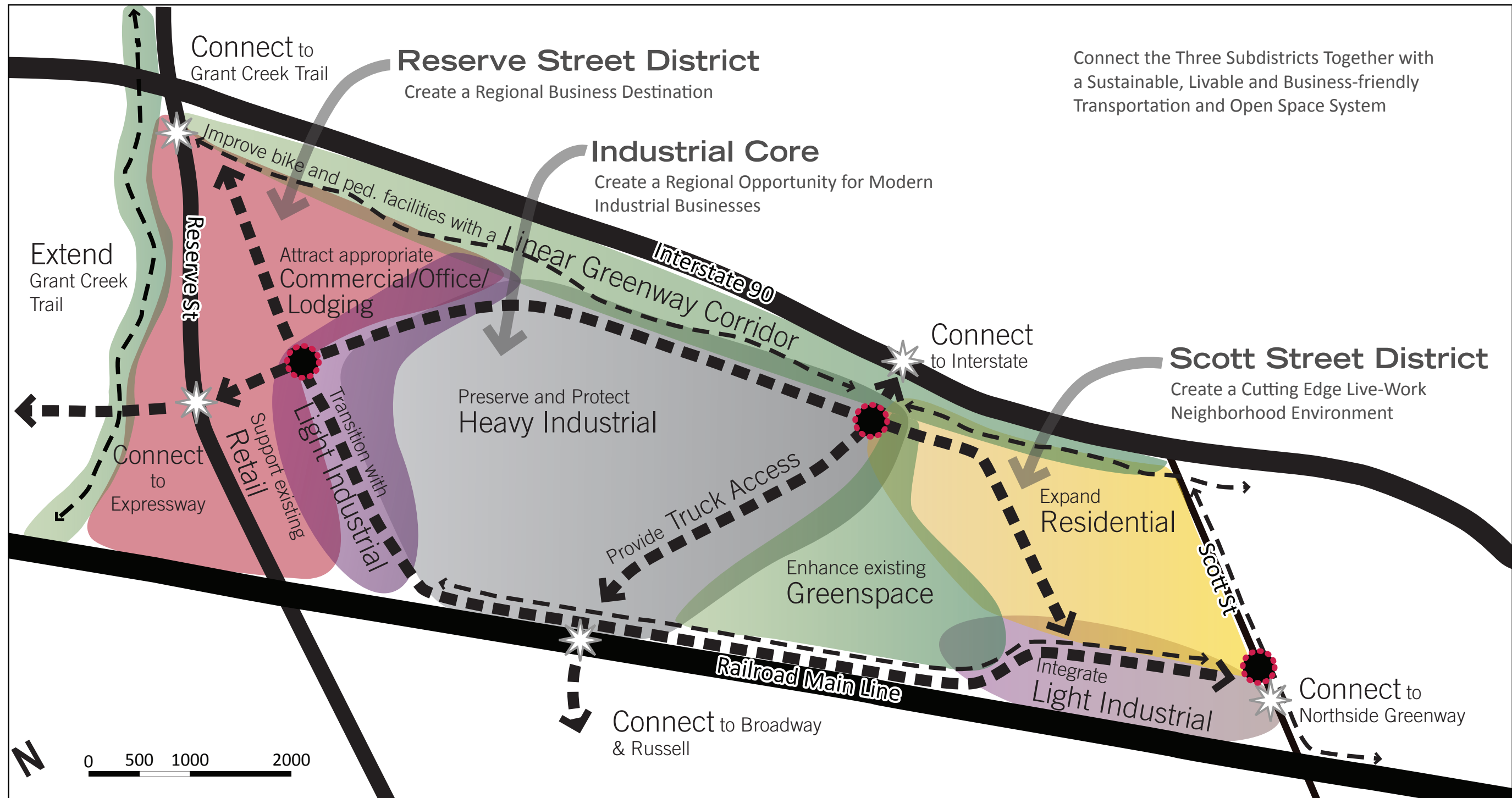
Given the history and industrial character of much of the area, the number of potential brownfields are not limited to only the locations outlined above. The lumber industry has occupied many sites in the area in the past and present, and the added presence of the railyard and adjacent fuel depots means that environmental factors will be a consideration when exploring redevelopment/reuse scenarios and right-of-way acquisition for the purposes of implementing transportation improvements. Environmental due diligence will be an important component of future efforts, especially where state or federal funds are necessary for implementation.



FIGURE 1 - STUDY AREA

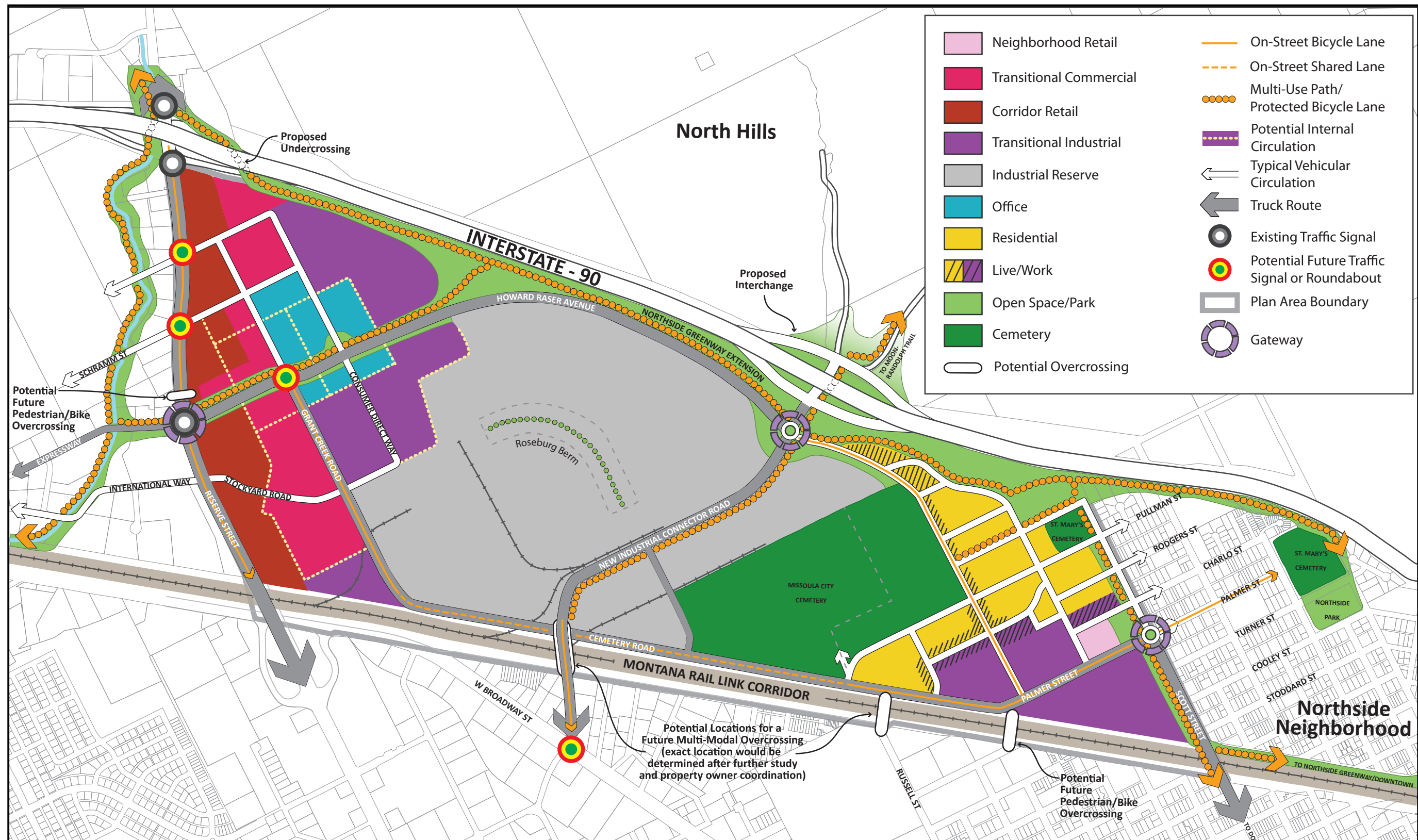
U.S. EPA Brownfields and Land Revitalization Technical Assistance
 North Reserve - Scott Street (NRSS) Complete Transportation Future
 Missoula, MT





The Plan Vision creates three unique sub-districts connected by a system of roads, trails, and open spaces.

FIGURE 2 - DEVELOPMENT ZONES AS DEPICTED IN THE 2016 NORTH RESERVE-SCOTT STREET MASTER PLAN



Specific land uses are recommended to create synergy and appropriate buffers between different land uses.

FIGURE 3 - CONCEPT PLAN SHOWING PROPOSED TRANSPORTATION CONNECTIONS AS DEPICTED IN THE 2016 NORTH RESERVE-SCOTT STREET MASTER PLAN

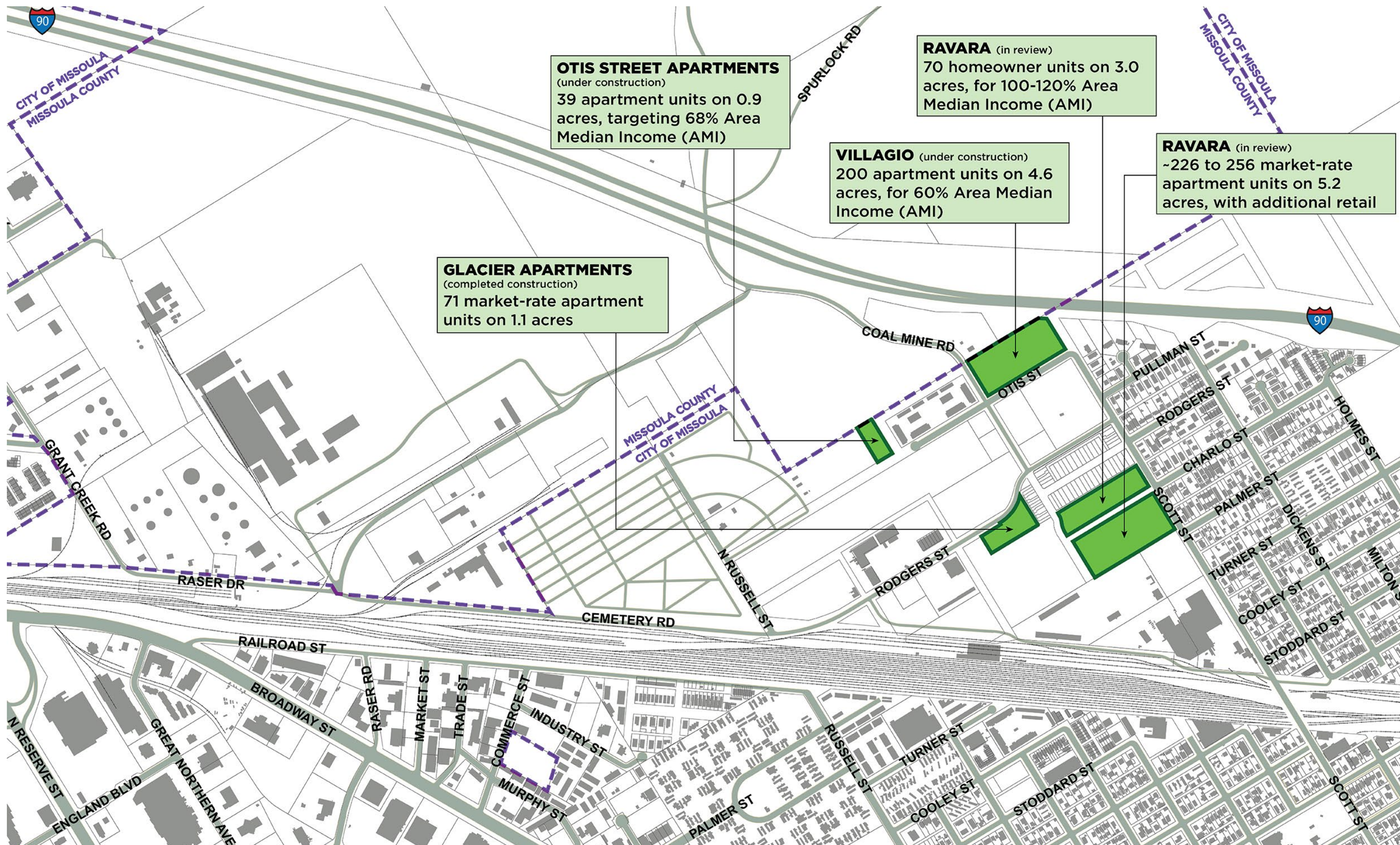


FIGURE 4 - RECENT OR PENDING DEVELOPMENT
 U.S. EPA Brownfields and Land Revitalization Technical Assistance
 North Reserve - Scott Street (NRSS) Complete Transportation Future
 Missoula, MT



North Reserve Scott Street

- Yellowstone Pipeline
- Railroad
- Plan Area
- Parcels
- Major Facilities**
 - Hexion Chemical
 - Bulk Storage Terminals
 - Missoula Landfill
 - Missoula White Pine Sash Facility
 - Roseburg Resources Co
 - Transportation Corridors
 - Former LS Jensen Construction Sand & Gravel (Consumer Direct)
 - Former Class III Landfill

January 2016

Disclaimer: This map is neither a legally recorded map nor a survey and is not intended to be used as such. WGM Group does not guarantee the accuracy, current status, or completeness of the material contained herein and is not responsible for any misuse or misrepresentation of this information or its derivatives. This map is a graphic representation and is to be used for general planning purposes only.

Project: 15-04-06 By: SMA, Reviewed: MS
 File: ms_02_MajorFacil Date: 1/27/2016
 Path: W:\Projects\150406\GIS\IMXD\ms_02_MajorFacil.mxd

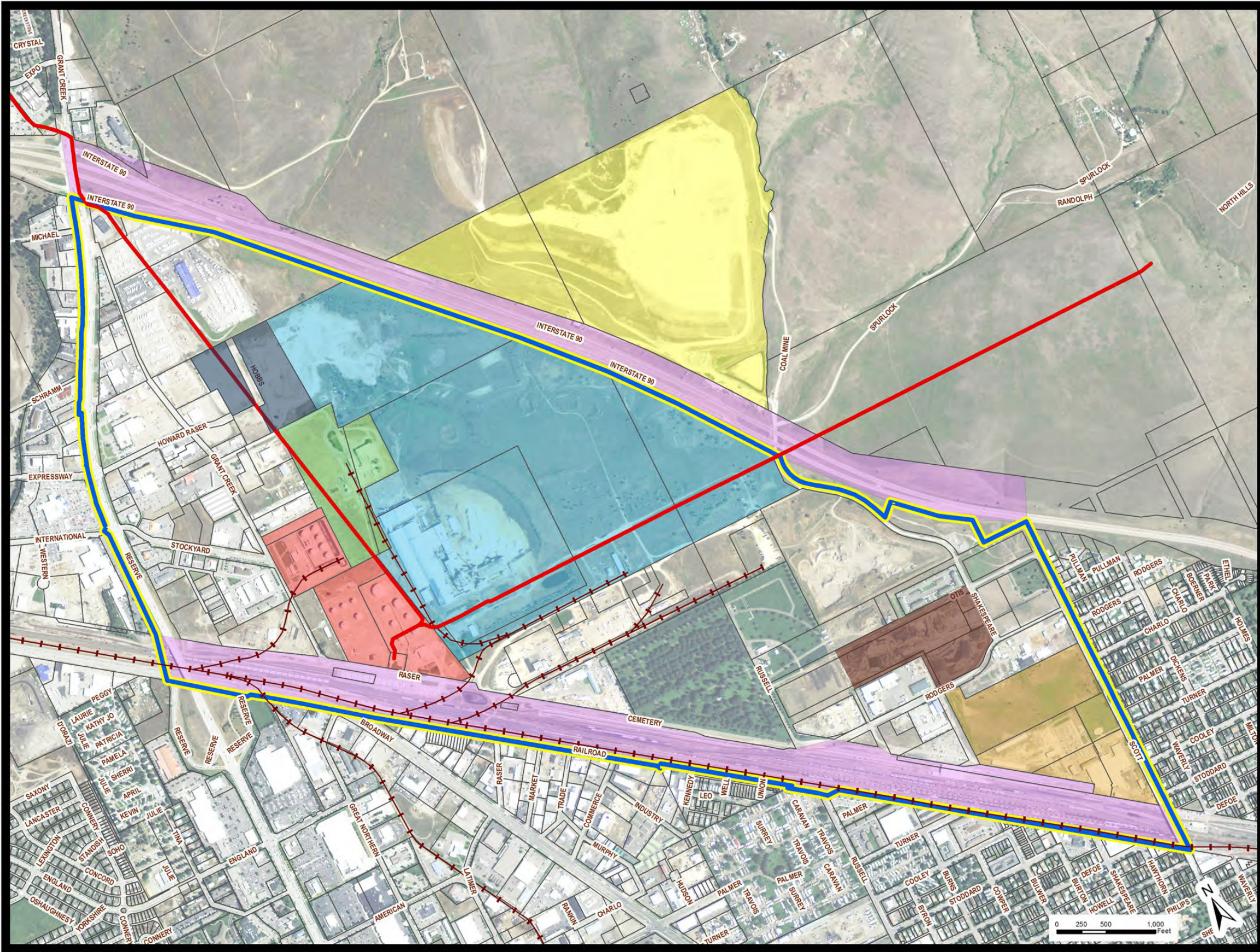


FIGURE 5 - MAJOR FACILITIES, INCLUDING SOME IDENTIFIED BROWNFIELDS AS DEPICTED IN THE 2016 NORTH RESERVE-SCOTT STREET MASTER PLAN

Draft Purpose and Need

If future transportation improvements move forward, the National Environmental Policy Act (NEPA) process will likely apply, and establishing the project Purpose and Need will be an important step in the NEPA review process as defined by Council on Environmental Quality (CEQ) regulation 1502.13. It establishes a foundation for decision-making by providing a rationale and justification for a proposed action. The Project Purpose defines the goals and underlying issues to be addressed by the proposed action. The Project Needs justify the Purpose with qualitative and quantitative effects and expected

outcomes of the proposed action. A draft Purpose and Need statement has been prepared based on information defined in previous planning studies and input received by the on-site working meetings held in October 2022. This draft Purpose and Need statement was used as a guidance tool to review the proposed improvement projects and, where applicable, alternatives. It should not be viewed as complete nor final, which can only be validated through the NEPA process with broader agency and public input.

PROJECT PURPOSE	PROJECT NEED
<p>Improve access between the North Reserve-Scott Street area and the wider Missoula City context, including the downtown central business district, major commercial areas, and other critical services including public safety.</p>	<p>The transportation network in the NRSS area is incomplete and discontinuous. As a result of the large freight railyard and support rail network, multi-modal and vehicular traffic is currently dependent upon three substandard routes to connect the surrounding area. Although the entire area is bounded by I-90, no direct/efficient connection to an interchange exists. If any of the existing connections is compromised, the area could be effectively disconnected from most of the corresponding origins and destinations, impacting major businesses as well as the growing residential population.</p>
<p>Improve multi-modal access for pedestrians, bicyclists, and transit riders.</p>	<p>Discontinuous sidewalks, missing pedestrian ramps and bicycle routes, and unsafe intersection crossings inhibit pedestrian safety, mobility, and access to transit. A lack of bicycle facilities and accommodations inhibit bicycle access and its viability as a travel mode, despite regional networks. Transportation improvements for multi-modal users can improve mobility and safety, while reducing demands on vehicular facilities.</p>
<p>Improve traffic operations.</p>	<p>Traffic volume is most significant on Scott Street and is projected to significantly increase with the completion of approved and planned developments. Traffic conflicts and lack of capacity are compounded by truck traffic, which travels through primarily residential areas to access Coal Mine Road en route to the landfill.</p>
<p>Support economic development and job creation.</p>	<p>The City of Missoula has conducted multiple planning studies that identified the NRSS URD as a strategic redevelopment zone within the city's growth area. Access to targeted brownfield parcels slated for redevelopment will support smart growth practices for an area that is close to commercial, governmental, and other services within the downtown, yet is not well served by multi-modal transportation facilities.</p>
<p>Provide better accommodations for freight movements for industry and commercial businesses while minimizing impacts to the community and residential neighborhoods.</p>	<p>Local industries need freight access to operate and freight movement passes through the residential portions of the NRSS area. Freight access must be maintained to support local businesses and new connections to the surrounding arterial and regional transportation network would reduce or remove freight movement through residential neighborhoods and improve safety and quality-of-life.</p>

Project Approach

PROGRAMMING REVIEW

The planning approach for the Technical Assistance provided focused on exploring the overall general engineering feasibility of the transportation improvements proposed in the 2016 NRSS Master Plan, though this study is not an engineering review. Work was performed utilizing available digital data and field observations. The goal of this technical review is to determine a perceived high-level feasibility of the projects or segments, identify options for conceptual geometry based on the available data, and determine likely next steps for the City of Missoula and Missoula County to work toward implementing each of the projects. Precise topographic information from survey data was not available for this study, which limited the ability to determine the full feasibility of certain proposed improvements.

RANGE OF COMMON SOLUTIONS

Based on the transportation needs of the study area, there are two primary solutions that can be employed to provide an improved transportation system. These two solutions are not mutually exclusive, and a preferred improvement alternative is likely to include a combination of both, realized over the long term.

- **Increasing Capacity and Improving Safety within Existing Connections**

Existing transportation facilities can be upgraded through spatial rearrangements, redesigns, and capacity improvements to enhance traffic control and safety measures. These typically are less extensive and less costly, and can be incrementally implemented. A wide variety of

these types of measures can have a substantial positive impact on addressing project needs. They may also be a first phase of immediate improvement “relief” deployed while other more extensive improvements proceed through design, permitting, and construction. These improvements also include upgrading existing facilities with “complete street” components to achieve improved multi-modal facilities and safety. Filling small scale gaps in the existing street grid/network (referenced as the current block structure in the 2016 NRSS Master Plan) might even be considered as a part of these types of improvements.

- **Creating New Connections**

Creating new connections represents a more substantial solution to address the need for enhanced connectivity and can provide dramatic change to how the overall transportation system functions by radically changing origin and destination travel patterns. New routes will bring relief to existing facilities by adding redundancy to the system and reducing the dependency and volumes on existing routes (at least in the near-term). Depending on the type of improvement, new connections typically require greater investment, may have more adverse impacts, and take significantly longer to realize.

With the scale and extent of the proposed improvements, the 2016 NRSS Master Plan advocates for a broader network approach to improving the overall transportation system of the area.

Intent & Potential Impacts

The intent of this Technical Assistance effort is to support the City in further defining the highly conceptual transportation improvements identified in the 2016 NRSS Master Plan. The intended outcome will help the City and its partners inform next steps, including allocation of budget resources to support origin/destination traffic studies, detailed preliminary engineering, and Montana Environmental Policy Act (MEPA)/NEPA environmental clearance review, with the goal of identifying a preferred feasible alternative. In some cases, additional alternatives for some segments have been identified and described herein. Other options or alternatives may exist beyond those identified to date. A key component of determining a preferred alternative or segment alternatives will require the comprehensive evaluation of environmental clearance parameters, especially if federal or state monies are included in the improvements, and the determination regarding any adverse impacts along with potential mitigation measures. Public engagement is part of the environmental clearance process. Some of the projects proposed in the 2016 NRSS Master Plan and depicted in this report have likely adverse impacts, including to private property owners. The U.S. EPA makes no endorsement of nor advocates for any of the proposed projects or improvements shown in this report.

Transportation Improvements and Potential Alternatives

To significantly improve the transportation infrastructure in the NRSS study area based on the parameters outlined in the Purpose and Need, it will be critical for the City of Missoula, Missoula County, and their partners to acknowledge the fact that improvements will likely be implemented in phases, based on the complexity and cost of each improvement project and as new traffic is generated through brownfield redevelopment (See Figures 6 and 7). No single project that is being considered in this Technical Assistance will serve as a comprehensive solution to the current and future transportation issues in the area. If the improvements are incrementally implemented based on sound transportation and traffic planning methodologies, on-the-ground conditions should functionally improve, especially as transportation circulation access points to enter and leave the study area are increased.

While this work seeks to begin advancing the design for the various projects beyond the level shown in the NRSS Master Plan, it should not be construed as a replacement for the preliminary engineering stage of each of these constituent projects. Preliminary engineering will require a much more substantial future effort to properly evaluate a full range of alternatives based on actual surveyed data, comprehensive traffic impact analyses, and budget considerations. Considerations of potential costs, specifically regarding the next step of work, have been provided; however, due to the highly conceptual level of design that was able to be performed, the information is presented purely to provide some context for capital budgeting/programming and grant funding pursuits.

1. BURNS STREET/TURNER STREET CONNECTOR

Among the major transportation improvement projects identified in the 2016 NRSS Master Plan, the proposed new connector route that links the current Coal Mine Road underpass of I-90 via an extension of the existing street grid network west of Scott Street provides significant improvements to connectivity. This connector positions the overall NRSS study area for additional connectivity opportunities that could be achieved by future projects considered as part of this evaluation (See Figure 8).

The new connector route aligns with the Burns Street extension south of the Montana Rail Link railyard. Traffic from the existing underpass, primarily truck traffic to and from the Republic Services landfill, could be diverted from Coal Mine Road to the new Burns Street connection. The connector further links up with the planned extension of Turner Street and connects to Scott Street near the northern terminus of the Scott Street Bridge.

BENEFITS

- The proposed Burns Street/Turner Street Connector would provide multiple circulation improvement benefits as a collector for the local road network, diverting existing truck traffic that currently travels through the growing residential area to an area that is primarily commercial and industrial, adjacent to the City Cemetery and the railyard.
- The existing east-west street grid would be extended to create a connection to the new Burns Street connector, helping to disperse non-truck traffic through the area and serving as a western bookend for the growing Northside neighborhood.

- These improvements to the local road network would establish a foundation on which the City and County could build and connect future improvements, such as the Howard Raser Drive connection to North Reserve Street, the new interchange with I-90 (Reference Improvement 4 discussed later), and the New Industrial Connector road (Reference Improvement 2 discussed later) that would serve industrial uses and link up with a new rail corridor flyover (Reference Improvement 5 discussed later). The connection that is created by the Burns Street/Turner Street extensions would provide immediate benefit and would become even more impactful as additional transportation improvements are linked to the northern portion of the new Burns Street.
- Of the transportation improvements recommended in the 2016 NRSS Master Plan, the Burns Street/Turner Street connector has fewer comparative potential adverse impacts. The project will require right-of-way acquisition of land from private property owners; however, that land is currently vacant.

FUTURE DESIGN CONSIDERATIONS

- If the new Burns Street is directly connected to the current underpass of I-90, the alignment near the interstate highway may require modifications depending on the final footprint of the interchange and the expected location of connections with the New Industrial Connector road.
- Portions of these improvements extend beyond the City of Missoula limits and therefore would rely on cooperation with Missoula County. The new Burns Street should be designed with sidewalks on the eastern side of the roadway cross-section and potentially a dedicated/separated 10' minimum-width multi-use path on the west side, along the cemetery frontage. There should be as few curb cuts as possible along the western side of the roadway to support bicycle traffic.

- While the potential adverse impacts appear to be less substantial than other projects considered in the 2016 NRSS Master Plan, further study, including a potential MEPA/NEPA environmental clearance review will be required, depending on the source of project funding. This planning evaluation will determine if adverse impacts exist and their extent, and if this project is justifiable compared to other alternatives when considering adverse impacts versus benefits. The improvement project will need to go through a right-of-way review and acquisition process to assemble the necessary right-of-way for the proposed roadways.

COST CONSIDERATIONS

Key cost considerations for next steps include:

- Required topographic and boundary surveying: Estimated \$30K to \$50K
- Preliminary engineering, including line and grade, utilities, right-of-way, etc.: Estimated \$250K
- Depending on the exact design and elements included (such as the inclusion of the multi-use sidepath option), construction costs could range between \$4M and \$6M (excluding right-of-way acquisition costs)

2. NEW INDUSTRIAL CONNECTOR

The “New Industrial Connector Road,” a roadway included in the NRSS Master Plan to connect from a proposed I-90 interchange to West Broadway Street, will disperse traffic in the NRSS area away from North Reserve Street and Scott Street, relieving the burden of those routes to handle traffic generated by new development. In conjunction with Howard Raser Drive, this new route enhances the road network and overall connectivity by providing a crucial link and landing point for other major projects considered as part of the overall NRSS Master Plan (See Figure 8). The New Industrial Connector follows the general

path of an existing unpaved/unimproved private driveway that has developed over time. The new roadway would be designed to handle truck traffic and, in conjunction with the potential rail corridor flyover, could also be designed as a multi-modal connection and provide residents from the Northside neighborhood with an additional connection to the North Reserve Street corridor.

BENEFITS

- The New Industrial Connector would create a full-access roadway to improve connectivity and disperse traffic from the Cemetery Road segment that parallels the Montana Rail Link.
- This roadway would provide an important basis for other major projects considered as part of the NRSS Master Plan, including the I-90 interchange and the Montana Rail Link rail corridor flyover, in particular.
- While the road serves primarily as a vehicular connection, it could also be designed to bolster multi-modal connectivity if a bicycle-pedestrian connection is included on or adjacent to the roadway (and, by extension, the rail corridor flyover).

FUTURE DESIGN CONSIDERATIONS

- Design of this roadway must be coordinated with plans for the Howard Raser Drive extension, as the two local roadways must interact when connecting into the street grid. Depending on the plans for the I-90 interchange and the implementation of a Burns Street extension, the hierarchy of these two connectors will have to be determined, as it may be difficult to connect both into the same intersection, even if a roundabout is implemented.
- The New Industrial Connector will require significant right-of-way acquisition.

- Performing a full-scale traffic impact study for the area will be critical to determine the need for this connection. It's possible that the New Industrial Connector would only be necessary if the new rail corridor flyover is implemented. In that case, the improvements may only be justified if it becomes part of the flyover improvements.
- Portions of the improvements extend outside of the City of Missoula limits and therefore would rely on cooperation with Missoula County.

COST CONSIDERATIONS

Key cost considerations for next steps include:

- Required topographic and boundary surveying: Estimated \$20K to \$30K
- Preliminary engineering, including line and grade, utilities, right-of-way, etc.: Estimated \$100K to \$150K
- Depending on the exact design and elements included, construction costs could range between \$1.5M and \$2.5M, depending on the inclusion of a roundabout (excluding right-of-way acquisition costs)

3. HOWARD RASER DRIVE CONNECTION

This transportation improvement to the local road network focuses on creating a Howard Raser Drive connector traversing the central portions of the NRSS study area to link the Northside neighborhood to the North Reserve Street corridor. This improvement project would serve as a critical local connection that would provide a travel route for vehicles originating in the growing Northside neighborhood to access the commercial corridor and the I-90 interchange along North Reserve Street (See Figures 7 and 8). As shown in the feasibility studies performed during this Technical Assistance work, Howard Raser Drive could be linked to Burns Street, via several localized routings and the Northside neighborhood street grid.

The transportation connection benefits could also be further enhanced should a future interchange with I-90 be constructed at the site of the existing Coal Mine Road underpass.

BENEFITS

- A direct extension of Howard Raser Drive to North Reserve Street would greatly improve connectivity across the entire Northside and would provide increased multi-modal connectivity options both locally and across the northern portion of Missoula.
- Even in the absence of a new interchange with I-90, the Howard Raser Drive connector would help disperse truck traffic from local industry and the Republic Services landfill to potentially divert portions of the truck traffic originating in or beyond the Northside neighborhood with an additional direct route to and from North Reserve Street.

FUTURE DESIGN CONSIDERATIONS

- This project would likely need to either precede the construction of a new interchange with I-90 or be constructed with the interchange in order to create the required connectivity to and from the interchange and the Northside neighborhood.
- The proposed connection will require right-of-way acquisition for the entire length of the roadway. Further study, including a potential MEPA/NEPA environmental clearance review, will be required depending on the source of project funding. This planning evaluation will determine adverse impacts and their extent and if this project is justifiable compared to other alternatives when considering adverse impacts versus benefits. The improvement project will need to go through a right-of-way review and acquisition process to assemble the necessary right-of-way, primarily from the Roseburg Forest Products property.
- Portions of this project extend outside of the City of Missoula limits and therefore would rely

on cooperation with Missoula County. For this and other elements considered as a part of the overall transportation improvement project, it will require a multi-jurisdictional approach to acquire right-of-way. A significant portion of the proposed improvements are located within Missoula County, rather than within the city limits. The MPO can assist with coordinating such efforts between the city and county, as it typically would for transportation improvements, but right-of-way acquisition will likely need to be led by each of the respective local governments.

- While the engineering of the Howard Raser Drive connector is significantly more straightforward than the interchange and railroad bridge projects considered in the NRSS Master Plan, a substantial amount of earthwork will be required to make the area traversable for a roadway, as significant topographic change exists between the North Reserve corridor and Scott Street.
- The City of Missoula should consider its long-term land use priorities for Howard Raser Drive, whether solely as a connector between two points or as a roadway with its own future (frontage) development potential. This decision could influence the final preferred alignment through the area. If the roadway is located close to the I-90 embankment, it would reduce how much of the Roseburg property is divided away from the main facility in a right-of-way acquisition, but it could also preclude any future development north and west of the new Howard Raser Drive. The potential impacts of each alignment will need to be considered as a part of a MEPA/NEPA environmental clearance review process to select a preferred alternative.
- The final alignment of Howard Raser Drive should be coordinated with the design of the separate “New Industrial Connector” roadway, which is also considered in the NRSS Master Plan and this Technical Assistance work, specifically as it relates to the intersection of the two roadways and the inclusion of a roundabout at the Burns Street intersection.

COST CONSIDERATIONS

Key cost considerations for next steps include:

- Required topographic and boundary surveying: Estimated \$30K to \$50K
- Preliminary engineering, including line and grade, utilities, right-of-way, etc.: Estimated \$200K to \$300K
- Depending on the exact design and elements included (such as the inclusion of the multi-use sidepath option), construction costs could range between \$5M and \$8M, depending on the inclusion of a roundabout (excluding right-of-way acquisition costs)

4. I-90 INTERCHANGE

As part of the NRSS Master Plan, the City of Missoula identified the desire for a new interchange along I-90, located between the current North Reserve Street interchange to the west and the current North Orange Street interchange to the east. A new interchange is frequently something that local stakeholders identify as a potential improvement to address traffic connectivity issues, especially when there is development occurring near a major highway. There are often significant challenges associated with creating a new interchange, which must be weighed against the need for such a connection and the timeline for when the improvements to the overall transportation system can be achieved. Due to the length of time needed to create a new interchange, interim surface network improvements that will link well with the future interchange can be undertaken first.

A full determination of the benefits of a new interchange can only be established through a comprehensive traffic impact study that analyzes origin and destination data and evaluates multiple alternatives. However, based on a high-level review of the existing roadway network, the current industrial context, the barriers to connectivity created by the large railyard, and the projected development growth patterns in the eastern portions of the study area, the

conditions are supportive of a new interchange to meet the projected transportation needs of the NRSS study area.

A review of the configuration presented in the NRSS Master Plan was performed using existing GIS data provided to the Technical Assistance team and the conditions observed on the ground to inform a highly schematic yet plausible layout and geometry. This schematic design may be utilized for subsequent engineering design phases as well as to inform the placement of other surface improvements discussed earlier in this document.

The identified configuration depicted assumes, for conservative cost-control purposes, utilizing the existing underpass of Coal Mine Road under I-90 for the connecting local road segment (See Figure 8). Using this alignment, a diamond interchange access pattern was developed, following general engineering design parameters for entrances/exits from a limited-access highway with the posted speed corresponding to those on I-90. The ramp alignments depicted were generated to minimize topographic grading cuts into the existing highway embankment and to limit the number of major retaining wall structures. These items typically result in significantly higher costs. The ramps were laid out to create 90-degree intersections allowing for optimized turning movements with the connecting local roadway, though skewed approaches could be explored in a more comprehensive engineering analysis. The configuration shown is one possible option for the interchange, which is more precise than what was depicted in the NRSS Master Plan. There are likely several other design alternatives, which can only truly be determined with actual topographic data. The information depicted is intended to provide the City and County with a sense of magnitude of right-of-way acquisition that is likely required for an interchange.

BENEFITS

- An interchange would provide for a greatly enhanced level of connectivity between the NRSS area and the rest of the city. It would create a dispersal route fully equipped to

manage the highest level of traffic demand for the area and would dramatically reduce the vehicular connectivity impairment to and from the Northside neighborhood by providing an alternative to crossing the Montana Rail Link railyard. This is especially valid if an additional flyover of the railyard is determined to be infeasible.

- An interchange would serve as a distributor for the industrial traffic in the area and reduce the need and impacts created by truck traffic utilizing the already-congested North Reserve Street or travelling via the residential streets of the Northside neighborhood to access I-90 or the Republic Services landfill.
- The regionally generated truck traffic to and from the immediately adjacent Republic Services landfill could be entirely diverted from the Northside neighborhood residential areas.
- It is assumed that a new interchange would also reduce the amount of vehicular traffic currently using the two existing adjacent I-90 interchanges and positively impact the levels of congestion by reducing travel volumes along North Reserve Street and North Orange Street.
- Utilizing the existing underpass location would substantially reduce the overall costs associated with a new interchange. Based on field measurements and the existing vertical clearance, which is already sufficient for freight truck traffic, the existing facility may be viable for an interchange with the proper upgrades to the roadway. A final determination of its adequacy would have to be established through a full engineering alternatives analysis and vetting with MDT.

FUTURE DESIGN CONSIDERATIONS

- An interchange with a federal interstate highway is a large-scale improvement that will require a major engineering design effort and a robust alternatives analysis to satisfy requirements for both MDT and the FHWA.

- The local road network should be considered with the needs of the interchange in mind, as the alignment and footprint of the interchange will shape the geometric parameters for the local surface streets in the area.
- The City should expect the design and implementation process to have a time horizon up to a decade or longer and establish its short and medium-term surface roadway improvement plans for the area with this timeline in mind. Depending on the complexity and costs determined through detailed engineering, the timeline may be shortened.
- Most of this project's improvements would extend outside of the City of Missoula limits and therefore would rely on cooperation with Missoula County and MDT.

COST CONSIDERATIONS

Key cost considerations for next steps include:

- Required topographic and boundary surveying: Estimated \$40K to \$50K
- Preliminary engineering, including line and grade, utilities, right-of-way, etc.: Estimated \$350K to \$400K
- Depending on the exact design and elements included, construction costs could range between \$10M and \$20M, depending on the extent of earthwork and structures necessary (excluding right-of-way acquisition costs and new I-90 span over Coal Mine Road)

5. RAIL CORRIDOR FLYOVER

A major improvement considered as part of the 2016 NRSS Master Plan and this Technical Assistance effort is an additional crossing (i.e., a flyover bridge) over the Montana Rail Link railyard. Such an improvement will require surface roadway connections, approaching ramps, and a bridge structure(s) that connect the existing roadway networks on the north and south side of the railyard (See Figure 9). These

improvements would likely have among the longest timelines for implementation, based on the need for extensive MEPA/NEPA environmental clearance review and alternatives analyses, potential right-of-way acquisitions, negotiation of easement rights with the railroad, and a likely high magnitude of costs associated with constructing a structure over an active railyard.

The proposed railyard flyover seeks to fill in a major gap in the overall multi-modal transportation connectivity for the area by introducing a grade-separated railroad crossing placed between the existing Scott Street and North Reserve Street flyovers, which are separated by a distance of approximately two miles along the railroad right-of-way. With the substantial development along the North Reserve Street corridor and more underway near Scott Street in particular, compounded by the truck traffic generated by the landfill north of I-90 and industrial activity in the NRSS area, the current transportation infrastructure is already at or near capacity. Multi-modal facilities are especially deficient. A new connection across the railyard located between the two existing flyovers, would introduce needed capacity and provide redundancy, especially if one of the existing flyovers is compromised, particularly the one at Scott Street.

A MEPA/NEPA environmental clearance review process will necessitate that a number of project alternatives be evaluated through engineering design and along with supporting technical analysis steps, including an environmental review, which determines potential adverse impacts, before a preferred alternative can be selected. Other alternatives beyond those contemplated in this document may include additional crossing locations, such as at Burns and Russell Streets. In all cases, a “no build” alternative will need to be evaluated as a part of the MEPA/NEPA environmental clearance review process. For the purposes of this Technical Assistance, the consultant team evaluated the alternatives considered in the NRSS Master Plan, which connects directly to Raser Road on the south side of the tracks, as well as three potential alternatives based

on the apparent geometry challenges for the Raser Road alternative. This information is intended to assist the City in informing a future full engineering feasibility study. This Technical Assistance makes no recommendations regarding which alternative may be preferred.

ALTERNATIVE A: DIRECT CONNECTION TO RASER ROAD

This alternative most closely follows the alignment suggested in the NRSS Master Plan for the proposed railyard crossing (See Figure 10). It begins to rise from the end of the New Industrial Connector North of the railyard, flying over Cemetery Road, traversing the railroad tracks and crossing over Railroad Street, before landing at the short surface segment of Raser Road that connects between Railroad Street and West Broadway.

BENEFITS

- This alternative follows what was initially proposed in the NRSS Master Plan document and it has the smallest footprint of any of the railyard crossing alternatives considered.
- It results in the shortest combined length of bridge structure and earthen abutments and would likely incur the lowest relative construction costs of the alternatives evaluated.
- Most of the existing street grid network would likely remain intact, with the only major change being the elimination of the intersection between Raser Road and Railroad Street.
- It would provide a direct connection from the NRSS area to West Broadway Street, allowing for traffic to distribute south of the railroad tracks in either direction.

FUTURE DESIGN CONSIDERATIONS

- The vertical geometry of this option will be difficult to resolve as a result of the required vertical clearance underneath a span over the railyard and the change in elevation from West Broadway Street to the railroad tracks. This vertical change is anticipated to be approximately 37 feet. Once the proper vertical curvature is accounted for in the alternative, the slope of the roadway as it approaches the intersection with West Broadway Street could be 8% or greater, presenting a difficult approach to the intersection, particularly for trucks and large vehicles.
- The intersection of Raser Road and West Broadway is likely to need significant realignment and upgrades to meet geometric requirements for trucks and large vehicles.
- Vehicular access to the properties located along Raser Road would be impacted, with some properties losing all vehicular access with no apparent mitigation from these impacts.
- The footprint of the bridge abutments/retaining walls, coupled with the close proximity of some existing buildings to Raser Road, means that right-of-way acquisition from adjacent properties will be required. The full extent of those impacts can only be established through more detailed engineering.

COST CONSIDERATIONS

Key cost considerations for next steps include:

- Required topographic and boundary surveying: Estimated \$80K to \$100K
- Preliminary engineering, including line and grade, utilities, right-of-way, etc.: Estimated \$750K to \$900K
- Due to the complexity of the project, a level-of-magnitude construction cost cannot be estimated, but it should be assumed that any alternative will exceed \$15M (not including right-of-way acquisition)

ALTERNATIVE B: ELEVATED “T” ABUTMENT AT RAILROAD STREET

As a potential method to address the limitation of the landing distance constraint discussed under Alternative A, this alternative utilizes a bridge span over the railyard that terminates at a perpendicular abutment at Railroad Street (See Figure 11). The abutment would follow the current Railroad Street right-of-way, rising from a location east of Railroad Street’s intersection with West Broadway Street to meet the elevation necessary for the bridge span to connect on the south side of the tracks and then descending back down to a point west of the Railroad Street intersection with Commerce Street. This design would require stop and/or yield signs at the elevated “T” intersection.

BENEFITS

- This layout counteracts the vertical geometry issue with landing on Raser Road described in Alternative A by accommodating longer ramped approaches to the flyover via an elevated Railroad Street, in each direction.
- The ability to facilitate traffic in both directions along Railroad Street may allow for an improved distribution of traffic volumes along West Broadway Street by dispersing it to both the east and the west at the top of the abutment instead of funneling all traffic into one signalized intersection at West Broadway.
- This alternative allows for the abutment/retaining wall area to reside primarily within the existing Railroad Street right-of-way, therefore potentially reducing right-of-way acquisition needs.
- The flyover spans over the Montana Rail Link railyard can be situated at a more perpendicular orientation to the tracks versus the other alternatives, potentially shortening the overall length of the elevated span.

FUTURE DESIGN CONSIDERATIONS

- While this alternative improves the landing distances for the bridge approaches, there are still constraints. On the south side of the tracks, particularly on the western approach from the intersection of Railroad Street and Broadway Street, the design may still result in a slope greater than 6% for this ramp approach.
- This alternative would have a larger overall footprint for the landing abutment/retaining walls than Alternative A.
- This alternative would necessitate other local road improvements in order to address the potential creation of multiple dead-end roads and to provide access to a parcel that could be landlocked by the creation of the abutment/retaining walls along Railroad Street.
- This alternative would require intersection improvements at multiple locations to serve both approaches to the flyover. The intersections with West Broadway Street at Railroad Street and Commerce Street would both have to be improved to accommodate increases in traffic volume, including potentially requiring traffic signal(s). Additionally, the intersection at Commerce Street and Railroad Street would also likely require improvements to accommodate new truck traffic.
- Modifications to Railroad Street east of Commerce Street may be needed to prohibit truck traffic from driving through the residential neighborhood along Russell Street.

COST CONSIDERATIONS

Key cost considerations for next steps include:

- Required topographic and boundary surveying: Estimated \$80K to \$100K
- Preliminary engineering, including line and grade, utilities, right-of-way, etc.: Estimated \$750K to \$900K

- Due to the complexity of the project, a level-of-magnitude construction cost cannot be estimated, but it should be assumed that any alternative will exceed \$15M (not including right-of-way acquisition)

ALTERNATIVE C: TWO ALTERNATIVES FOR AN ENGLAND BOULEVARD EXTENSION

As a response to the vertical and horizontal geometry limitations described for Alternatives A and B, an additional Alternative (with an two separate potential end points) was explored. Alternative C considers an extension of the flyover, beyond the railyard to the south, to also pass over West Broadway Street and land at a point south of West Broadway to connect to the existing street grid (See Figure 12). This connection would extend the existing England Boulevard right-of-way to connect with the flyover and provide a more sufficient horizontal length for the landing distance for the elevated bridge approach. It would also provide more connectivity capabilities to both West Broadway Street and North Reserve Street.

Two sub-options of this alternative have been explored in this analysis—one with the existing private rail siding running through the area south of West Broadway Street severed and another that looks at the option with the rail siding remaining active.

Alternative C-1: England Boulevard Extension with Private Rail Siding Abandoned

Alternative C-1 has the existing private rail siding severed at the point of the proposed flyover and its sloped approach, allowing the rail corridor flyover to connect into Great Northern Avenue at its current intersection with England Boulevard. As result of the sloping roadway connecting to grade, adequate vertical clearance could not be accommodated to maintain rail operation on the siding.

BENEFITS

- This alternative addresses the significant vertical geometry challenges that exist with Alternatives

A and B by extending the length of the flyover approach, giving the roadway more distance to descend to grade after clearing the southern boundary of the railyard near Railroad Street.

- While not creating a direct connection to West Broadway Street, this alternative would land the flyover approximately 1,000 feet from the existing Great Northern Avenue intersection with West Broadway, providing easy access to the main road while also allowing for distribution of traffic in multiple directions and to both major nearby arterial roadways.
- This option would also provide direct connectivity to the North Reserve Street corridor via the existing connection of England Boulevard with North Reserve.
- Linking the NRSS area with multiple major arterial roadways south of the rail corridor, this alternative has the potential to divert a significant volume of traffic from the existing Scott Street railyard flyover and improve the redundancy of the local vehicular transportation network in this section of the city. It would also potentially improve response times for emergency services within the NRSS area, since the services are provided from locations south of the railyard.

FUTURE DESIGN CONSIDERATIONS

- This alternative would require significant right-of-way acquisition and result in significant property impacts.
- While the extension of the flyover would alleviate the most critical geometry issues with landing the terminus of the flyover south of the railyard, it would also necessitate another bridge span over West Broadway Street, increasing the overall cost of the project when compared to Alternatives A and B.
- Improvements to Great Northern Avenue would likely be required to accommodate the higher

traffic volumes introduced to the roadway by the flyover connection. Improvements to the nearby intersections with West Broadway Street and American Way may also be needed.

Alternative C-2: England Boulevard Extension with Private Rail Siding Remaining

Alternative C-2 has the rail siding remaining in place between Great Northern Avenue and West Broadway Street as a result of the location of the southern flyover landing terminus (See Figure 13). The alternative would have most of the same benefits as Alternative C-1, but with the flyover abutment to terminate at England Boulevard, crossing Great Northern Avenue to connect directly to England Boulevard.

BENEFITS

- This alternative would connect the railyard flyover directly into the commercial hub along North Reserve Street, via England Boulevard, for distribution of traffic along the major arterial.
- The rail siding between West Broadway Street and Great Northern Avenue would not be impacted.
- North Reserve Street would be used as the main means of distributing traffic volumes generated from the flyover, resulting in a direct connection between the NRSS area and the southwestern neighborhoods of Missoula.
- West Broadway Street would be accessed through the existing interchange with North Reserve Street south of the rail corridor, which is likely designed to handle the additional capacity without requiring significant improvements, if any.

FUTURE DESIGN CONSIDERATIONS

- This alternative would potentially require the dead-ending of Great Northern Avenue on either side of the abutment/retaining walls for the flyover, which will have negative impacts

on traffic patterns in the immediate area, even though existing alternative connections exist.

- In order to maintain the rail siding, an additional bridge span would be required as a part of the flyover, resulting in higher costs when compared to the other alternatives.
- Similar right-of-way acquisition considerations would need to be addressed in this alternative as described in Alternative C-1.

COST CONSIDERATIONS

- Required topographic and boundary surveying: Estimated \$80K to \$100K
- Preliminary engineering, including line and grade, utilities, right-of-way, etc.: Estimated \$750K to \$900K
- Due to the complexity of the project, a level-of-magnitude construction cost cannot be estimated, but it should be assumed that any alternative will exceed \$20M (not including right-of-way acquisition)

NRSS MULTI-USE TRAIL

Based on the recommendation of the NRSS Master Plan, two primary alternatives were identified for a multi-use trail connecting Scott Street and North Reserve Street: one that would follow the base of the I-90 highway embankment and another that would be constructed as a multi-use sidepath in conjunction with the future Howard Raser Drive and other new roadway segments (See Figure 7). The former could be designed in such a way to try and follow the flattest portions of the embankment and minimize the amount of earthwork required. The alignment shown follows benches in the embankment (based on the GIS topography) wherever possible. For the alternative constructed as part of the roadway cross-section of Howard Raser Drive, the multi-use trail would be incorporated directly into the overall roadway construction, allowing for right-of-way acquisition, costs of earthwork, drainage, and construction to be easily combined as a part of one construction project.

BENEFITS

- This multi-use trail, whether as an independent alignment or as part of a parallel roadway project, would serve as a major improvement in multi-modal connectivity across the NRSS area, as the only current route for non-vehicular traffic is to follow Cemetery Road, which effectively has no shoulders and which handles traffic from nearby industrial sites and the railyard. The multi-use trail would serve as a major safety upgrade in this corridor and the overall NRSS area.
- For the independent multi-use trail alternative along the highway embankment, the project would have a limited footprint and would likely require less right-of-way acquisition for the trail route specifically. This would serve as a way to improve multi-modal connectivity ahead of some of the other proposed major transportation improvements.
- For the multi-use trail alternative constructed as part of Howard Raser Drive cross-section, the cost of this project could be incorporated into the overall roadway project, potentially reducing the relative cost for the additional trail benefit. This alternative also provides a direct connection to a signalized intersection to cross North Reserve Street and connect to the proposed Grant Creek Trail.

FUTURE DESIGN CONSIDERATIONS

- While a separate underpass connection for the trail was considered in the NRSS Master Plan, it is unlikely that such a connection would be feasible beneath a major interstate highway. However, there is already a potential connection point for a multi-use trail under the highway at the existing North Reserve Street interchange with I-90.
- Intersection upgrades and other features such as additional lighting and pavement markings are recommended to improve multi-modal safety at the existing North Reserve Street/I-90 interchange/overpass location.

- Notwithstanding the need for right-of-way acquisition, incorporating the multi-use trail along Howard Raser Drive will likely be the least complicated alternative from a design perspective, since it will be incorporated into a single project right-of-way. Right-of-way acquisition for the independent trail, especially as a meandering route, at a minimum, may require a separate right-of-way acquisition and justification, particularly if the trail is not entirely within the MDT/I-90 right-of-way.
- The City of Missoula should consider having a multi-use sidepath trail connection along the western side of the proposed Burns/Turner Street Connector as a way to provide greater multi-modal connectivity within the NRSS area. This side of the corridor should have limited curb cuts to allow for a more continuous, uninterrupted trail facility.

COST CONSIDERATIONS

For the independent trail:

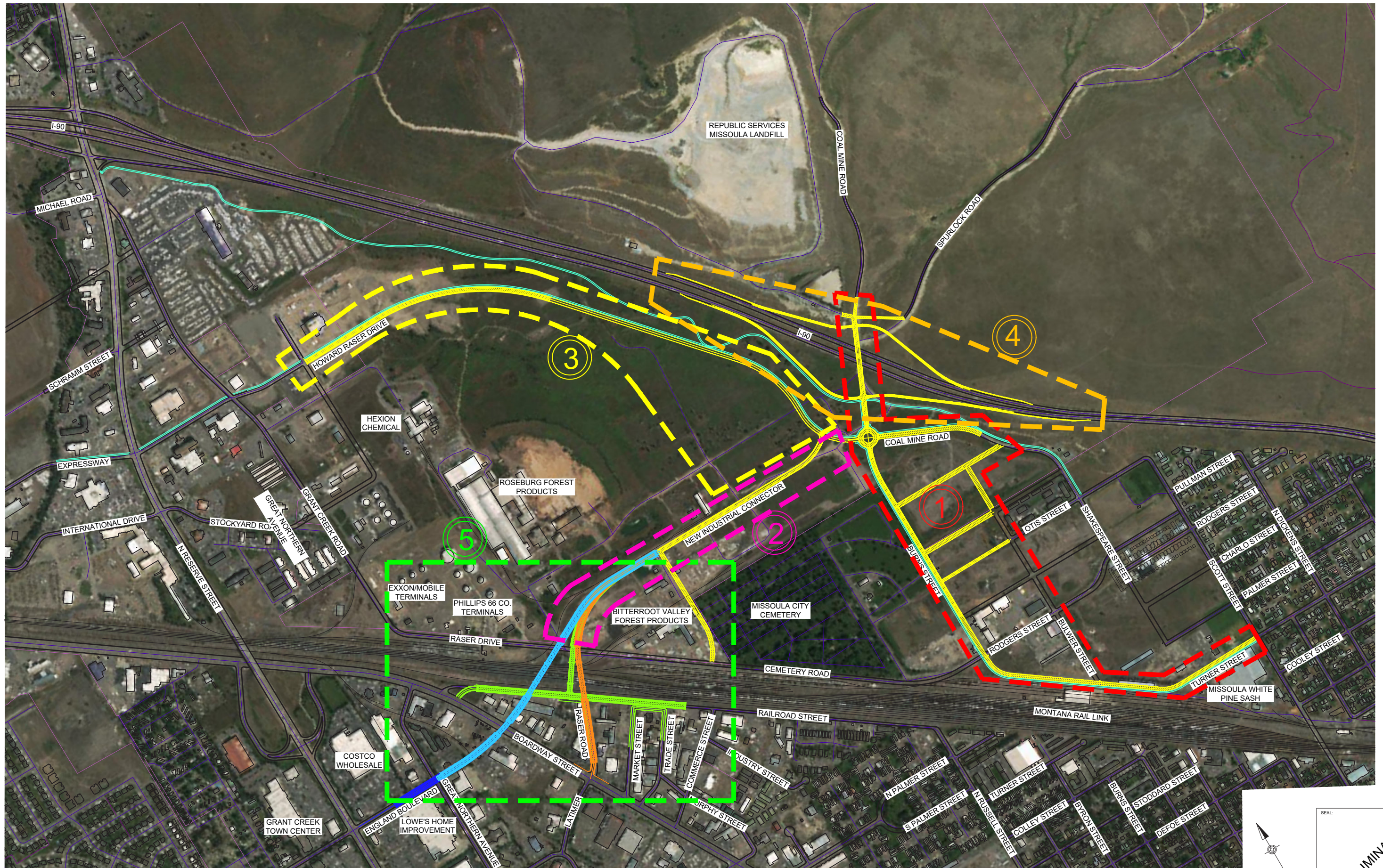
- Required topographic and boundary surveying: Estimated \$25K to \$30K
- Preliminary engineering, including line and grade, utilities, right-of-way, etc.: Estimated \$100K
- Construction costs could range between \$1M and \$1.25M (excluding right-of-way acquisition costs)

If included as a part of the Howard Raser Drive extension, level-of-magnitude costs are discussed in that project's section of the report.

Outcomes

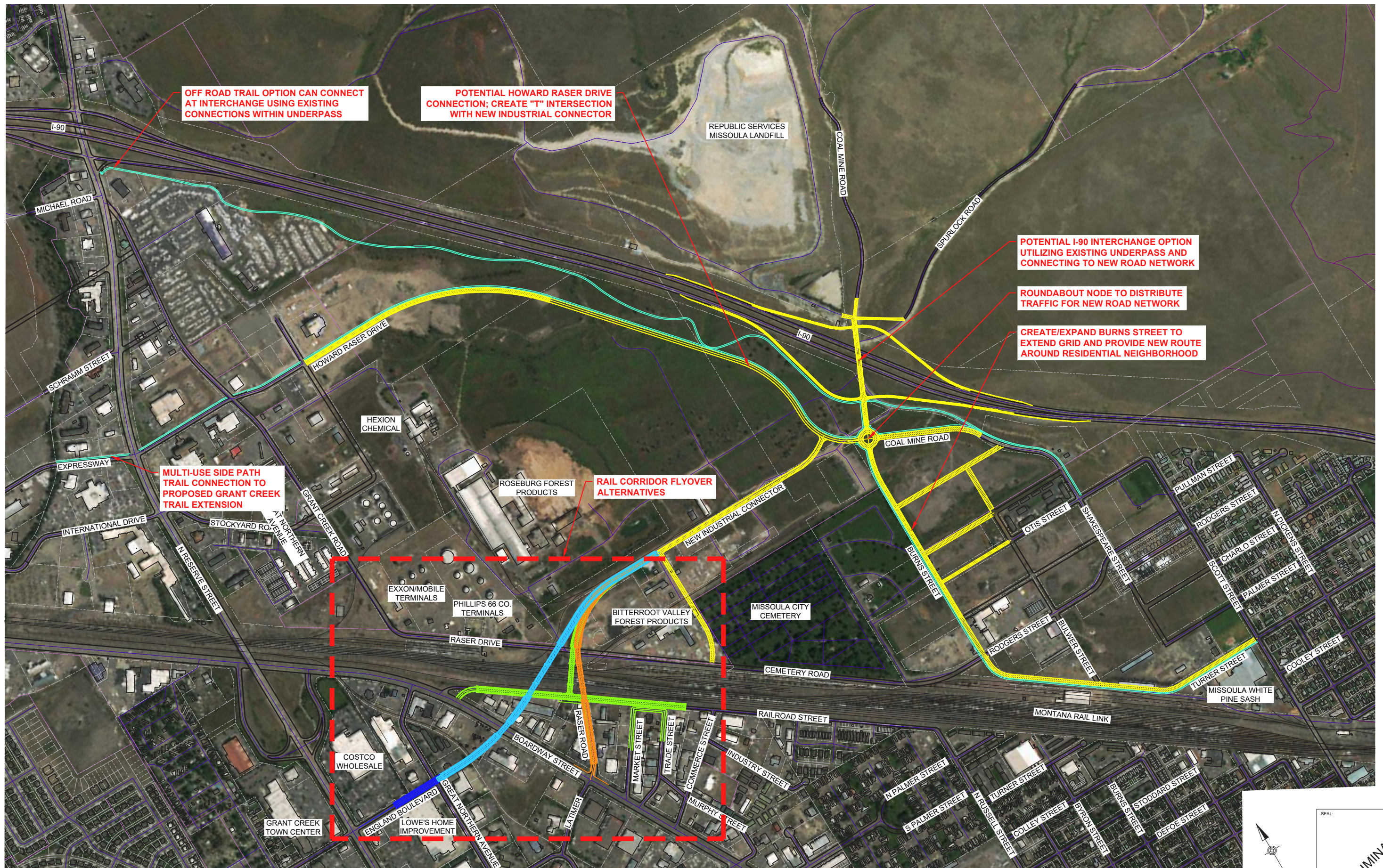
Based on a review of the 2016 NRSS Master Plan projects, the following actions could be considered by the City of Missoula to advance its goals to improve the multi-modal connectivity of the NRSS study area.

- A. Undertake an area-wide traffic model focusing on modeling existing and projected traffic generation and volumes as well as origin and destination of trips. This model would allow for a more robust evaluation of which connections are likely to have the most benefit and the effects each component project may have on broader traffic patterns.
- B. Determine, in partnership with MDT and the County, a project engineering approach that defines the “project” within a preliminary engineering and MEPA/NEPA environmental clearance review process. It will be important to determine whether all of the projects within the group identified here should be considered one overall project, or if components or specific improvement phases could constitute stand-alone projects. This may influence how projects are undertaken in phases and how quickly they can be completed.
- C. Advance the Burns/Turner Street connection as a first phase of transportation improvements of the overall project.
- D. Develop a Capital Improvement Plan focused on allocating budgets for a local funding portion for the Burns/Turner Street connection. This CIP can be treated as either a stand-alone locally funded project or allocated as a local match for state and/or federal funding.
- E. Check the MDT STIP and the Missoula MPO TIP to coordinate timelines related to the larger projects within the Missoula Connect Long-Range Transportation Plan, particularly for the interchange project.



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SEAL:
PRELIMINARY



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SEAL:
PRELIMINARY



SEAL:
PRELIMINARY

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PRELIMINARY



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ALTERNATIVE B - ELEVATED "T" ABUTMENT AT RAILROAD STREET

ABRUPT HORIZONTAL CURVE TRANSITION BETWEEN FLYOVER APPROACH AND BROADWAY GRADE MAY BE A GEOMETRIC LIMITATION FOR LARGE VEHICLES; TRAFFIC VOLUMES MAY REQUIRE INTERSECTION SIGNAL WARRANT

RAMPED APPROACHES ARE PROVIDED FROM EAST AND WEST RAILROAD STREET; POTENTIALLY DISPERSING TRAFFIC VOLUMES

THROUGH TRUCK TRAFFIC RESTRICTION VIA GEOMETRIC DEVICE TO PREVENT TRAFFIC THROUGH RESIDENTIAL AREA

LANDLOCKED PARCELS REQUIRE SERVICE ACCESS DRIVE

CREATE LOOP ROAD FOR TRADE AND MARKET STREETS TO MAINTAIN CIRCULATION

UPGRADE INTERSECTION AT COMMERCE AND BROADWAY STREET - TRAFFIC VOLUMES MAY REQUIRE INTERSECTION SIGNAL WARRANT

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ALTERNATIVE C-2 - ENGLAND BOULEVARD EXTENSION

EXXON/MOBILE TERMINALS

PHILLIPS 66 CO. TERMINALS

RASER DRIVE

CROSSES AT NARROWER POINT OF RAILYARD

BITTERROOT VALLEY FOREST PRODUCTS

MISSOULA CITY CEMETERY

CEMETERY ROAD

MONTANA RAIL LINK

SIGNIFICANT PRIVATE PROPERTY IMPACTS FOR ROW

CONNECTION TO N. RESERVE STREET CREATED BY EXTENDING FLYOVER ABOVE BROADWAY STREET

COSTCO WHOLESALE

SIGNIFICANT PRIVATE PROPERTY IMPACTS FOR ROW

FLYOVER RAMP REACHES GRADE TO MAINTAIN RAIL SIDING

RAMP RETAINING WALLS WILL SEVER GREAT NORTHERN AVENUE

FULL DRIVEWAY ACCESS MAINTAINED FOR LOWES/COSTCO

LOWE'S HOME IMPROVEMENT

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PRELIMINARY