

Missoula Greater Downtown Master Plan Infrastructure Elements

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Missoula Greater Downtown Master Plan Infrastructure Elements

This report details the infrastructure requirements necessary to support full implementation of the *Missoula Downtown Master Plan*. The information and analysis builds on the infrastructure recommendations contained in the *2005 Downtown Streets Project Report*.

Downtown Missoula Access & Circulation

Improvements to access and circulation in downtown will serve as a catalyst for redevelopment. The *2005 Downtown Streets Project* included recommendations for these proposed changes and a detailed traffic study to look at the traffic impacts of these changes. The 2008 Missoula Long Range Transportation Plan (LRTP) is currently underway and includes an update for projected land use and travel patterns in Missoula, including downtown.

Downtown Land Use & Travel Patterns

The proximity of housing to downtown employment is the single biggest factor for determining travel mode choice for commuting to work. A variety of desirable housing products downtown will allow people to walk and bike to work year round. This land use pattern can result in a 30-40 percent reduction in motor vehicle traffic. The benefits are clear in terms of air quality and reduced cost for motor vehicle infrastructure. Figure 1 shows an aerial view of our existing downtown and existing land use and road network patterns. Figures 2 and 3 show existing zoning and comprehensive plan designations for the downtown study area.

Missoula has three major impediments to north/south travel; the Clark Fork River, the railroad, and Interstate 90. Our downtown is sandwiched between these barriers. Residential areas exist to the south and north of these barriers. Most commuters have to cross one or two of the barriers to get to downtown. Crossing these barriers is difficult as few crossing points exist and are generally congestion points. The infrastructure necessary to cross these barriers is expensive.

Missoula has invested heavily in trail bridges to cross the river and has a great trail system on both sides of the river to bring travelers to the crossing points. The University of Montana employs about 3,000 people and has about 14,000 students enrolled. The University is a major daily trip generator in the city. We believe that the residential land use in the downtown should be focused along both sides of the river. We need to accommodate east/west travel and use the trail system as a commute facility, including students and employees at the University. People want to live along the river and great trail and park system.

We believe that higher density residential should be encouraged through out the downtown plan study area including infill sites and upper floors of existing buildings, and along both sides of the river in vacant and underutilized sites such as the Old Sawmill District, West Broadway and the MRL rail yard area. This will facilitate non-motorized trips via the existing and proposed trail systems to both downtown offices, retail areas and to the University of Montana Campus.

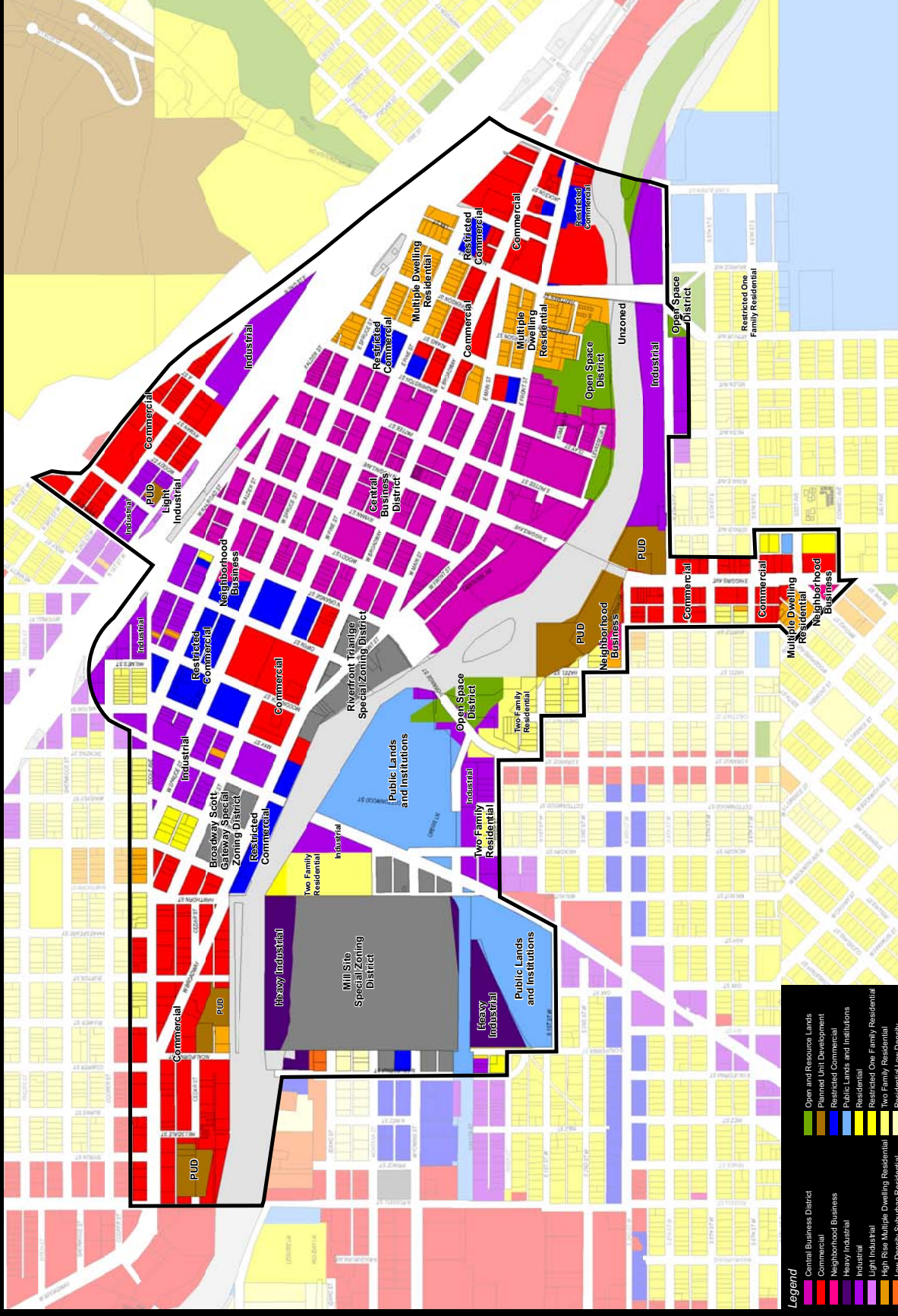


Downtown Missoula Master Plan

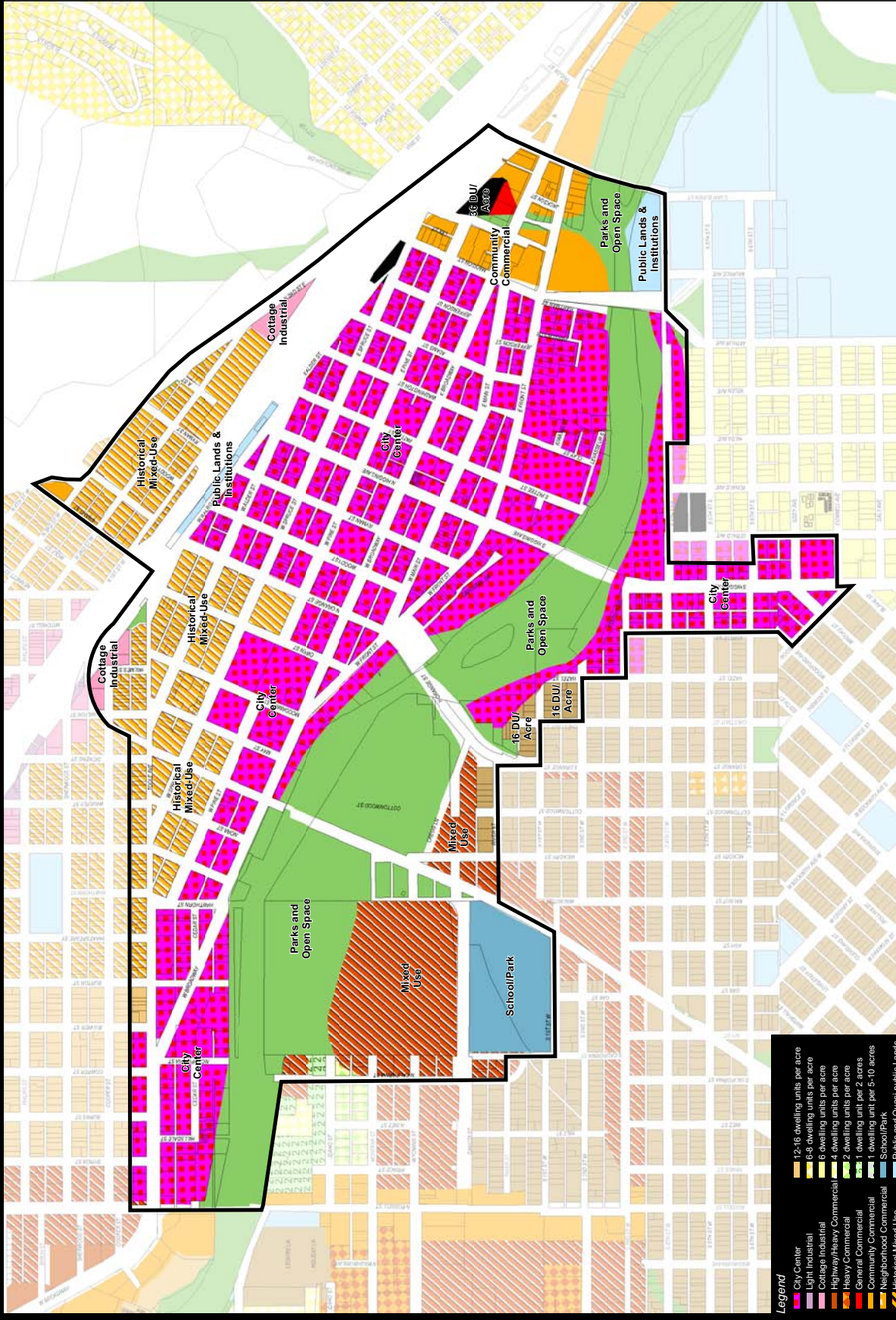
Missoula, Montana

Zoning Exhibit

Figure 2



- Legend**
- Central Business District
 - Commercial
 - Neighborhood Business
 - Heavy Industrial
 - Industrial
 - Light Industrial
 - High Rise Multiple Dwelling Residential
 - Low Density Suburban Residential
 - Mixed Use
 - Multiple Dwelling Residential
 - Open Space District
 - Open and Resource Lands
 - Planned Unit Development
 - Restricted Commercial
 - Public Lands and Institutions
 - Residential
 - Restricted One Family Residential
 - Two Family Residential
 - Residential Low Density
 - Special ZD
 - Unzoned



- Legend**
- City Center
 - Light Industrial
 - Cottage Industrial
 - Highway/Heavy Commercial
 - Heavy Commercial
 - General Commercial
 - Community Commercial
 - Neighborhood Commercial
 - Historical Mixed-Use
 - Mixed-Use
 - Public and Quasi-public Lands
 - Existing Park
 - Parks and Open Space
 - 12-16 dwelling units per acre
 - 6-8 dwelling units per acre
 - 4 dwelling units per acre
 - 2 dwelling units per acre
 - 1 dwelling unit per 2 acres
 - 1 dwelling unit per 5-10 acres
 - School/Park
 - 36 DU/Acre
 - 16 DU/Acre
 - 16 dwelling units per acre
 - 36 dwelling units per acre

Downtown Transportation Facilities

Existing transportation facilities serving the downtown area include streets, public transit and trails. The existing street classification and traffic volumes are shown on Figure 4. Improvements to the streets include providing upgrades to existing sidewalks to improve accommodations for bikes and pedestrians. Bulb-outs, updated ADA ramps and pedestrian countdown timers at signals are needed improvements. Additional discussion of recommended street improvements is included in subsequent sections of this report.

Higgins Avenue – It is recommended that Higgins Avenue be retrofitted to better accommodate bicycle travel. This can be accomplished in two different ways, by the addition of protected bikeways or bike lanes. Depending on the option selected, various traffic modifications would be required. These modifications are addressed in detail in a subsequent section of this report. There is not currently community agreement on what form the Higgins Avenue improvements should take. Additional detailed traffic study and public involvement will be required to make a final decision on Higgins Avenue. The public involvement and detailed study should be completed with the design phase of the project, which would also include an environmental review.

West Broadway – Similar issues exist on the final configuration of West Broadway. Bicycle improvements are recommended. However, the form of those improvements and the final lane configuration is deferred to future analysis. A protected bikeway on West Broadway would work very well along the river on the section from Front Street to Burton Street. The recommendation for West Broadway configuration is contained in the recently completed “*West Broadway Corridor Community Vision Plan*”. Table 4.1 – Priority Implementation Matrix on page 91 shows a work task of “Evaluate 4-lane roadway for West Broadway” to be completed with each transportation plan update. The plan also states “If a four-lane roadway configuration has not been implemented to this point, traffic volumes will likely require a four-lane section or an alternative east-west traffic route”. It is the intent of this document to be consistent with the recommendations contained in the West Broadway Plan.

Orange Street – The existing underpass on Orange Street is an impediment to pedestrians and bike travel. The existing configuration also restricts access to Alder Street by limiting southbound left turns. This restriction to access could be repaired with minor modifications to the retaining walls on the bridge approach. This improvement in access would help revitalize the Alder Street portion of downtown and was included in the Downtown Streets Project. There is substantial residential development planned north of the railroad tracks. The traffic for this development would use Orange Street and Greenough Drive railroad crossing. The new bike/pedestrian crossing of the railroad will be a critical connection between the new residential areas and the core downtown business area. This will greatly reduce the motor vehicle traffic using Orange Street and Greenough Drive.

Bicycle Accommodations – Bike lanes exist on a few streets in the downtown study area but they are limited and do not provide a well-connected system for bike users. Much discussion in stakeholder meetings for this study has centered on the option of protected bikeways vs. designated on-street bike lanes. Bike lanes provide excellent facilities for the experienced

commuter rider who is accustomed to riding in traffic. Bike lanes accommodate bikes as part of the traffic flow with motor vehicles. Protected bikeways have been discussed extensively and recommended for Higgins Avenue and Broadway. Protected bikeways are adjacent to the existing pedestrian sidewalks and can be viewed as widened sidewalks that accommodate a broader set of potential riders by providing separation from moving traffic. It is recommended that the City incorporate plans for protected bikeways in subsequent studies of downtown streets.

Transit – Figure 5 shows existing bus transit service routes in the study area. It is recommended that the City coordinate with Mountain Line in undertaking a plan for a fixed route circulator trolley in the downtown. Discussion should also continue on the potential for light rail transit system on the existing Bitterroot Spur Line. Planning for these systems should include discussion of a new transit station at the intersection of these transit facilities near Spruce Street. This new transit station will accommodate route transfer between the different transit facilities.

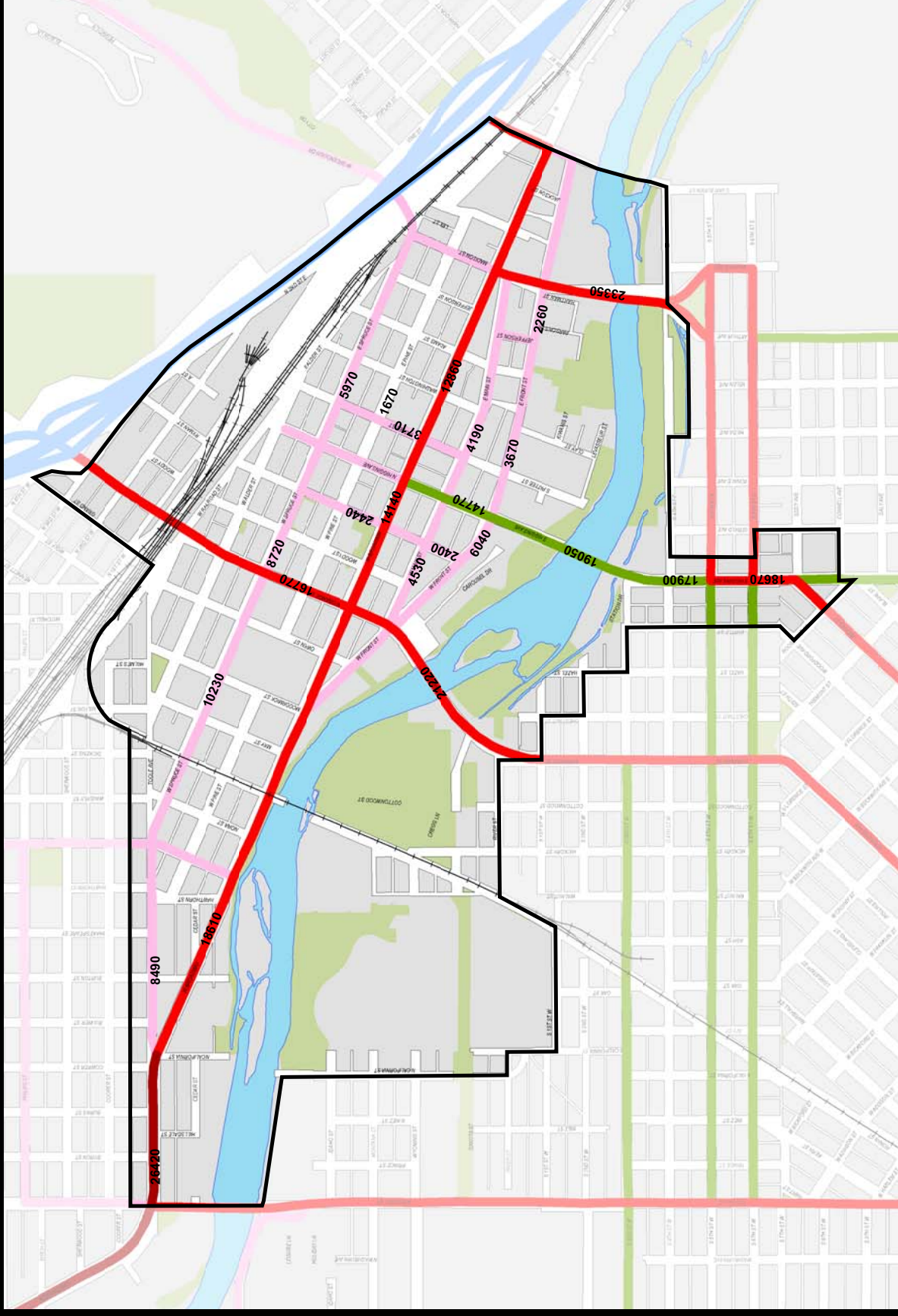
Trails – Missoula's existing trail system within this study area is primarily located along the Clark Fork River. Several gaps exist in the existing trail system. A plan for a project to provide reclamation and cleanup along the Clark Fork River includes completion of the trail system. A description of this project is included in subsequent sections of this report.

Street & Sidewalk Lighting – Existing Street Lighting in downtown is sporadic and most areas do not meet current standards for street lighting. The sporadic light and dark patterns created by the existing sub-standard lighting creates a safety concern for bikes and pedestrians. It is often dark during wintertime morning and evening commute times in Missoula. Improving safety for non-motorized commuters is a major objective of the study. A comprehensive program to upgrade street lighting in the downtown is recommended. Numerous street lighting districts exist in downtown and are shown in Attachment A, Figure A-5. Historic lighting poles with night sky compliant fixtures should be provided to adequately light the street and sidewalks.

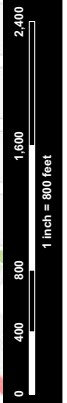
Downtown Missoula Master Plan

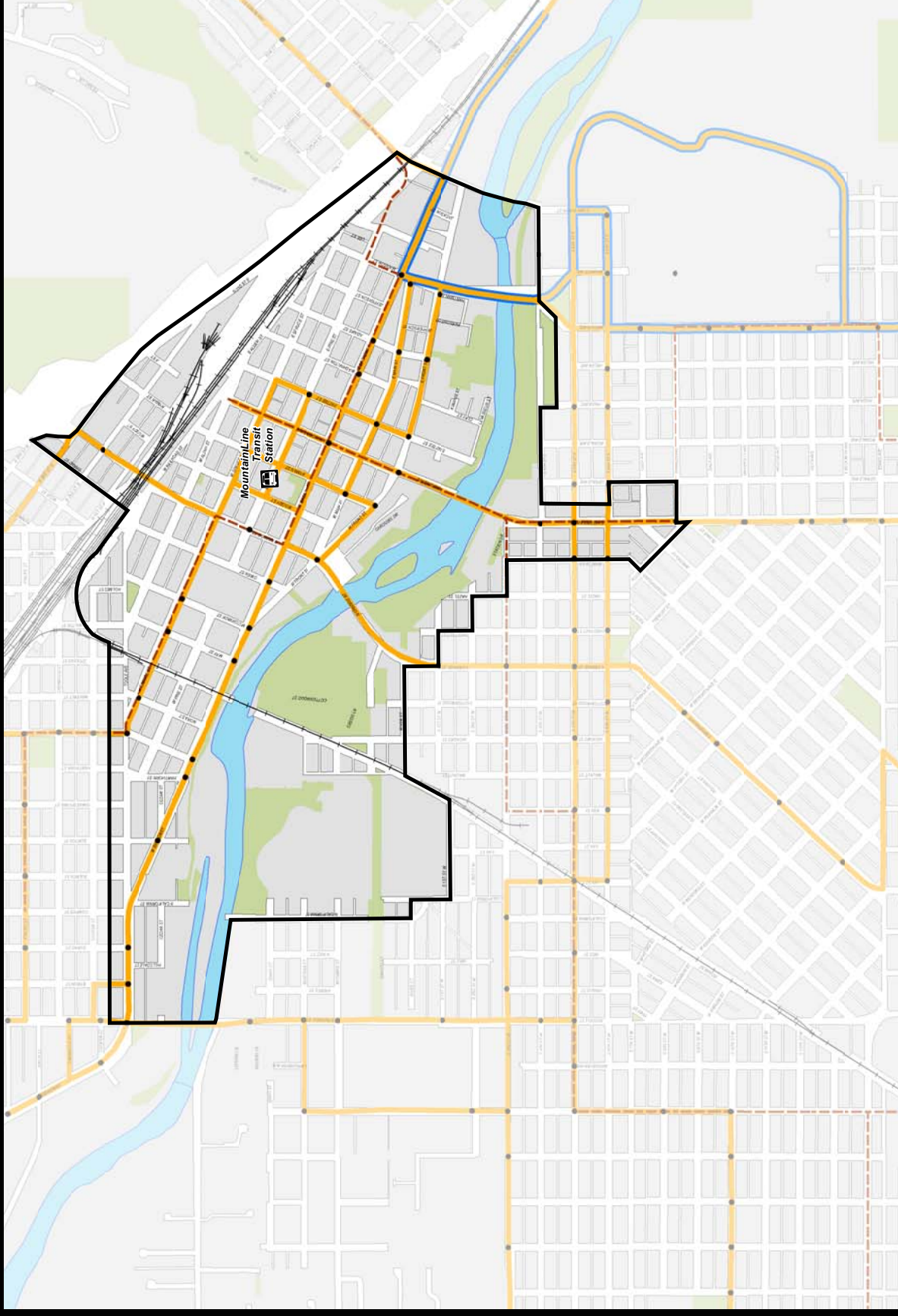
Missoula, Montana

Transportation Classification Exhibit
Figure 4



- Legend**
- Interstate
 - Non Interstate NHS
 - Arterial
 - Minor Arterial
 - Collector
 - 21330 Traffic Counts





The 2005 Downtown Streets Project

Traffic projections for the year 2025 were developed to evaluate potential service life estimates for various combinations of improvements. A “no-action” option was included to serve as a benchmark for each of the potential improvements. A 20-year traffic growth rate of 0.8 percent per year was derived based on the best available information at the time from the LRTP. Options evaluated included upgrading the existing signals downtown, reconfiguring Higgins Avenue and eliminating the one-way couplet on Front Street and Main Street. Reconfigurations of Higgins Avenue included diagonal parking north of Broadway and on street designated bike lanes from 6th Street to Broadway. All options evaluated include upgrading the traffic signals in downtown to include pedestrian and vehicle detection and countdown timers to improve pedestrian safety and convenience.

These improvements provided benefits to air quality, traffic circulation, pedestrian and bicycle safety and convenience. Table 1 shows the projected immediate benefits of these changes to traffic operations and air quality. All options provide improvement when compared to the existing traffic configuration. Table 2 shows the projected traffic and air quality benefit in the year 2025. A lack of funding prevented these improvements from being implemented. Funding for a limited version of the Higgins Project is included in the current update to the LRTP. Diagonal parking on North Higgins is currently not included in the recommendation.

Higgins Avenue

The public process for the Downtown Master Plan included significant conversation on potential Higgins Avenue modifications. Many individuals expressed a strong need for bicycle improvements on Higgins Avenue. Facilities discussed included dedicated bike lanes and protected bikeways adjacent to the sidewalks. Both are excellent choices for accommodating bicycle traffic for different target rider groups. Each option includes advantages and disadvantages and no clear support for either alternative was developed. There are also concerns about making any changes to the traffic configuration on Higgins Avenue. Facilitating a decision on what improvements should be planned for Higgins Avenue will take additional study, analysis, design and cost estimating along with a series of public meetings dedicated solely to the subject. The Planning team recommends protected bikeways for Higgins Avenue consistent with the stated policy objective of providing safe and convenient bicycle facilities for all ages of users. If federal transportation funds are used, any conversion or changes on Higgins Avenue will require further detailed environmental review (Environmental Assessment), public involvement and updated traffic projections. Analysis shows that a three lane alternative on Higgins Avenue from 5th Street to Railroad Avenue as shown in Figure 6 will on the whole, function better as a three lane street that it does currently. The analysis shows projected traffic operations on Higgins Avenue to be Level of Service (LOS) E and F in the year 2025 with the current lane configuration¹. Higgins Avenue traffic operations would improve to LOS C and D or better as a three-lane street with a two-way Front & Main Streets².

¹ Figure 3-5, Missoula Downtown Street Project Final Report

² Figure 3-9, Missoula Downtown Street Project Final Report

Higgins Avenue improvements are included in the LRTP and the adopted 2009-2013 Missoula Transportation Improvement Program (TIP) and are to be funded with federal transportation funds. A detailed environmental review and public process will be necessary during the planning and design of the project prior to construction. Montana Department of Transportation (MDT) and Federal Highway Administration (FHWA) review and approval would also be necessary. Alternative bicycle accommodations will undoubtedly be an issue during the environmental review process. An additional detailed study and analysis of the Higgins Avenue corridor will be necessary prior to final recommendations on lane configurations. Planning for protected bikeways recommended in this Plan preserves the options for future bicycle accommodations.

**-Table 1 -
Two-way Front & Main and 3 Lane Higgins Performance Summary
2005 PM Peak Hour**

Measure of Effectiveness, MOE's (1)	No Action	Optimized Signals (2)	Two-Way Front & Main & 3 Lane Higgins (3)
No. of Intersections	15	15	16
Cycle Length	90	90	90
Delay/Vehicle (sec/veh.)	16	11	13
Total Delay in System (hours)	108	78	101
Stops	10958	10369	11108
Average Speed (mph)	13	15	14
Fuel Consumed (gal)	256	231	255
CO Emissions (kg)	17.87	16.16	17.86
Unserved Vehicles	0	0	0
Traffic Performance Index	138.7	106.8	132.0
Percentage Improvement	0 %	23 %	5 %

**- Table 2 -
Two-way Front & Main and 3 Lane Higgins Performance Summary
2025 PM Peak Hour**

Measure of Effectiveness, MOE's (1)	No Action	Optimized Signals	Two-Way Front & Main & 3 Lane Higgins*
No. of Intersections	15	15	16
Cycle Length	90	90	90
Delay/Vehicle (sec/veh.)	38	14	27
Total Delay in System (hours)	313	113	239
Stops	14992	13232	13594
Average Speed (mph)	8	14	9
Fuel Consumed (gal)	441	288	385
CO Emissions (kg)	30.84	20.15	26.89
Unserved Vehicles	0	0	19
Traffic Performance Index	354.5	150.2	276.5
Percentage Improvement	0 %	58 %	22 %

- (1) See Missoula Downtown Streets Project Report for a description of MOE's.
- (2) Existing lane configuration with new signal controllers and traveler detection system.
- (3) Includes optimized traffic signals and designated bike lanes.

2008 Missoula Long Range Transportation Plan (LRTP)

Comparing the TransCAD model projected land use increases between now and 2035 to the Crandall/Arambula (CA) Capacity Diagram land use increases results are shown in Table 3.

- Table 3 -
2035 LRTP and Downtown Master Plan Land Use Comparisons

	Dwelling Units	Retail (s.f.)	Non-retail (s.f.)
Missoula TransCAD Model	1,452	1,253,580	241,080
CA Capacity Diagram	2,796	487,500	1,004,900
Difference	+1,344	-766,080	+763,820

The significant increase in dwelling units will result in higher commute related travel demand. The proximity of the residential to employment centers will result is a significant increase in non-motorized travel as a mode choice. This reduction in vehicle traffic is not built into the 2008 LRTP travel prediction models. The existing model exclusively includes **motor vehicle trips** and does not account for mode choice by modeling **person trips** by individual mode. It is unclear whether the model adjusts trip generation to account for location and mode choice.

We reviewed the 2005 and 2035 average daily traffic (ADT) projections from within the 2035 Existing + Committed traffic model for the LRTP at approximately 20 locations in the Downtown Master Plan study area. These volumes showed a consistent one percent per year compounded growth rate for the 30-year timeframe analyzed. This is consistent with the 0.8 percent growth rate used in the Downtown Streets traffic analysis. Based on the land use comparison contained in Table 3, we believe the trip generation of the land use in the DTMP will be slightly higher than contained in the LRTP but not by a significant amount. Additional modeling of person trips and projected land use from the MDTMP would be helpful during the design phase of projects in the downtown. Accurate travel demand modeling is essential in assessing and designing appropriate transportation improvements given the current MDT and FHWA design standards. Greater flexibility would exist for urban street design if local funding sources were developed.

Current Transportation Funding

The 2008 Missoula area transportation funding totaled approximately \$12.6 M from federal, state and local sources. These funds are used for the maintenance and operation of the local street, highway and transit transportation systems. Table 4 summarizes the 2008 transportation funding levels and recipients for the Missoula Metropolitan Planning (MPO) area. Current project needs in the transportation improvement plan far exceed available funding levels. The

historic funding shortfall has resulted in significant deficiencies in our local transportation system with many city streets lacking basic curb, gutter and sidewalk to accommodate pedestrians and preserve existing pavement life. Table 5 summarizes 2006 federal and state gas tax revenues in Missoula County. We provide this information to facilitate the economic analysis for this plan.

- Table 4 -
2008 Missoula Transportation Funding Levels (1)

Funding Source	2008 Total (2)	Recipients				
		MDT	MUTD (3)	MPO	City	County
Misc. (Federal & State)	\$1,327.2	1,242.8	84.4			
CMAQ (Federal)	\$1,867.3			1,229.0		
STP (Federal)	\$2,351.9			2,144.0	311.1	211.3
FTA (Transit & TMA)	\$1,229.0		1,229.0			
Local	\$5,844.8		2,144.0		3,378.4	322.4
Total	\$12,620.2	1,242.8	3,457.4	3,696.7	3,689.5	533.7

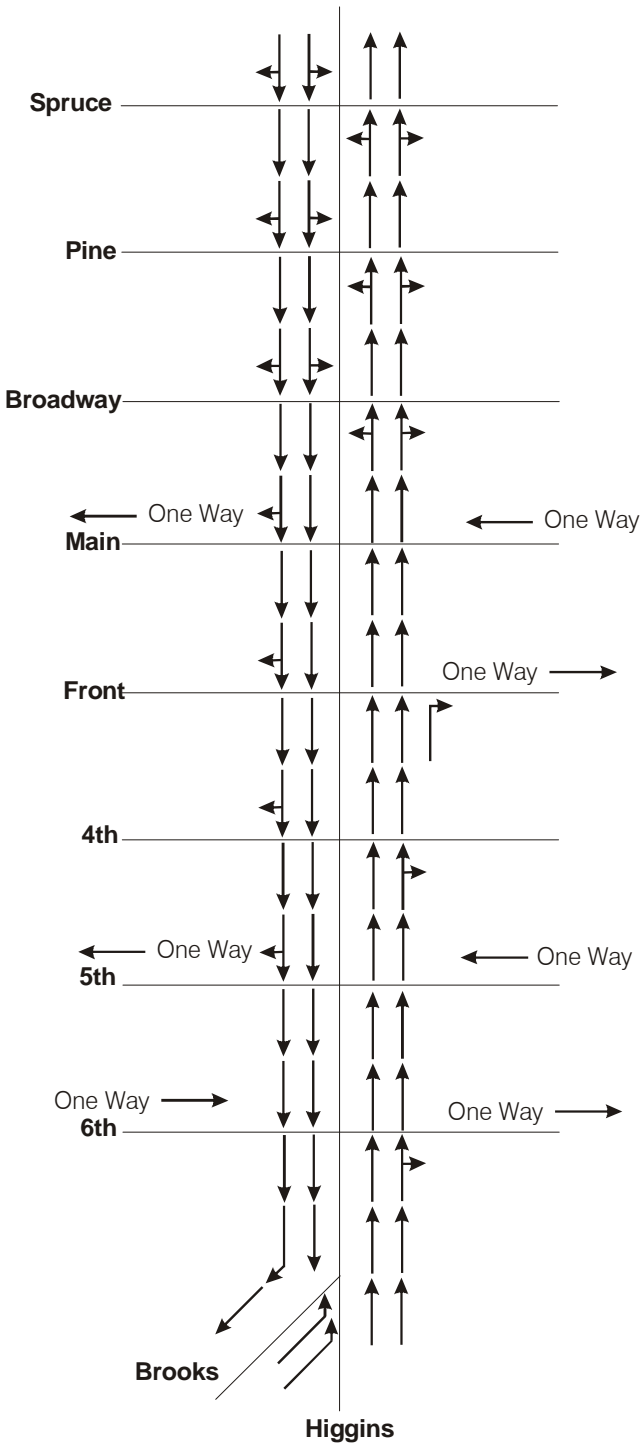
- (1) Source: Missoula Office of Planning and Grants funding tables dated 9/22/08
- (2) Amounts shown in \$1,000's
- (3) Missoula Urban Transportation District (Transit)

- Table 5 -
2006 Missoula County Gas Tax Revenues (1)

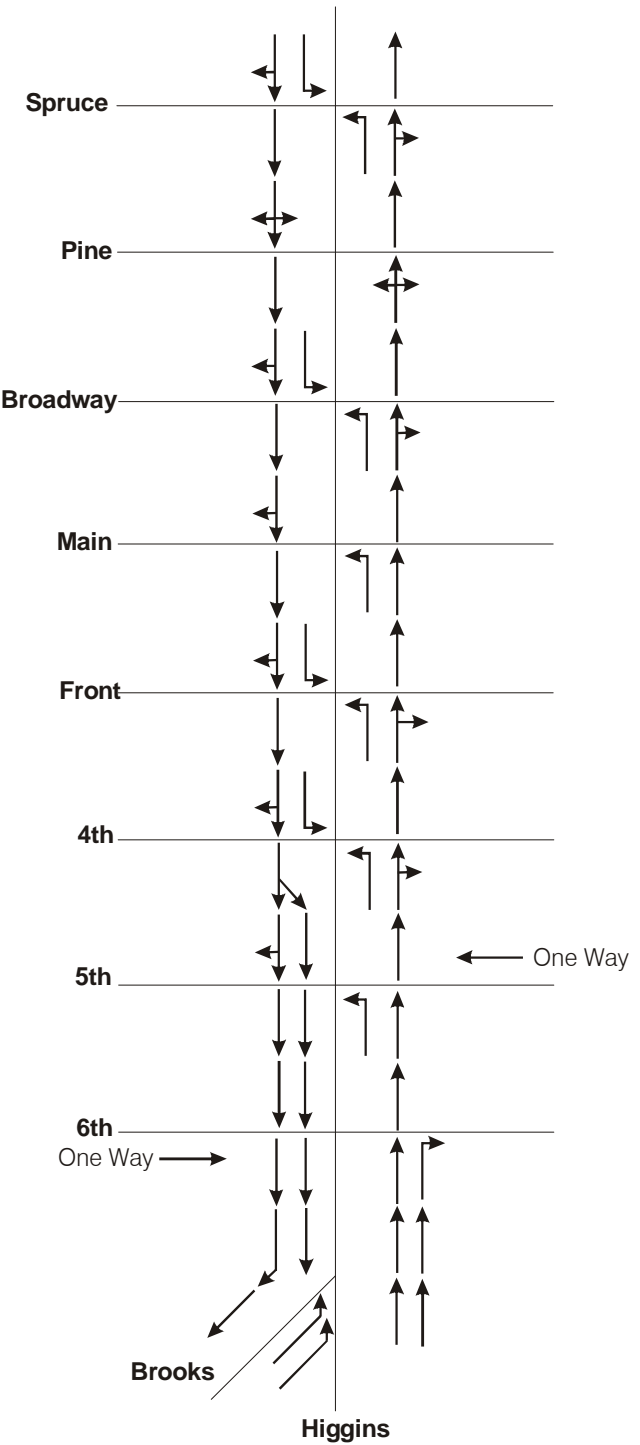
	\$/gal	Outlying Areas	Missoula City	County Total (2)
Gallons Pumped (3)		24,358.0	79,687.9	104,045.9
State Gas Tax	0.270	6,281.1	18,188.0	\$24,469.1
Federal Gas Tax	0.184	4,264.7	12,420.0	\$16,684.7
Total	0.454	10,545.8	31,608.0	\$41,153.8

- (1) Source: Fuel Tax Management & Analysis Bureau, Montana Department of Transportation
- (2) Amounts shown in \$1,000's
- (3) Diesel, Gasoline & Gasohol in 1,000's of gallons

Figure 6 -Higgins Avenue Configurations



Existing Higgins
Avenue Configuration



Three Lane Higgins
with Two Way Front &
Main Streets

Public Infrastructure

Attachment A includes maps showing existing infrastructure in the downtown area and notes on identified improvements to support the master plan. The land use shown in the CA Capacity Diagram (Table 3) was provided to each utility provider. Meetings were then held with each to discuss the adequacy of their systems to accommodate the proposed land use. Attachment B includes a list and brief description of infrastructure projects recommended to complete the Downtown Master Plan. An order of magnitude cost allowance is included for each project. A summary of the cost allowance for each infrastructure upgrade is as included in Table 6.

Sanitary Sewer – Figure A-1 shows existing sewer facilities in the downtown area with notes detailing specific issues. The City has been working on upgrades and maintenance of the existing sanitary sewer system and indicates the existing system is in good condition. The system appears to be adequate to accommodate the land use included in the CA Capacity Diagram.

Drinking Water – The drinking water infrastructure in Missoula's downtown is privately owned and operated by the Mountain Water Company. The existing water system will require substantial upgrades to accommodate the proposed land use. General upgrades to the system are discussed on Figure A-2 along with a map of existing facilities that serve the downtown area.

Storm Drainage – The existing storm drainage system in Downtown is shown on Figure A-3. The existing system is very old and in poor condition. The City has limited information on the existing system or capacity to accommodate runoff events. A major upgrade to this system is recommended to accommodate future growth and development in downtown.

Gas & Electric – Figure A-4 shows existing power and natural gas facilities serving the downtown area. Meetings with NorthWestern Energy officials indicate the existing facilities are adequate to accommodate the proposed land use. The existing substation on the Clark Fork River presents an impediment to future redevelopment in the area. Discussions with NorthWestern Energy representatives indicated that the cost to relocate the facility would be in the tens of millions of dollars. They indicated they approached the City of Missoula about relocation of this facility in the 1980's at a fraction of current relocation costs. While the existing facility detracts from the area, relocation of the facility is not recommended due to the enormous costs, lack of funding and long list of higher priorities in the downtown.

Overhead power lines exist throughout downtown and represent a hazardous impediment for fire fighters and construction workers. The existing streetlights are served by overhead power lines strung from pole to pole. This tangle of overhead lines contributes to the visual clutter and interferes with establishing a desirable street tree canopy in downtown. It is recommended that these low voltage supply lines be undergrounded whenever possible. High voltage lines exist near the substation, on Pattee Street and in many of the alleys off of Pattee. Undergrounding these lines is very expensive and is in most cases cost prohibitive.

Telecommunications – The existing telecommunications providers downtown were reluctant to provide maps showing their existing facilities due to the proprietary nature of the information. Conversations with Qwest Communications representatives indicate that they would be able to accommodate the proposed land use with their facilities.

Parking Structures – Parking facilities recommendations are dealt with in detail in a separate study and report for this project. Preliminary recommendations indicate the need for three additional parking structures downtown.

Parks & Squares – Parks are an important part of the social infrastructure of downtown. Significant enhancements to existing parks and new squares are recommended in the study. A brief description of each enhancement is included in Attachment B.

Table 6 – Infrastructure Needs

System Improvement	Cost Allowance
Transportation	\$ 174.8 M
Sanitary Sewer	\$ 0.8 M
Storm Drainage	\$ 7.5 M
Drinking Water	\$ 20.0 M
Parking Structures	\$ 34.0 M
Parks & Squares	\$ 55.0 M
Total Investment	\$ 292.1 M

Clark Fork River Revitalization Project

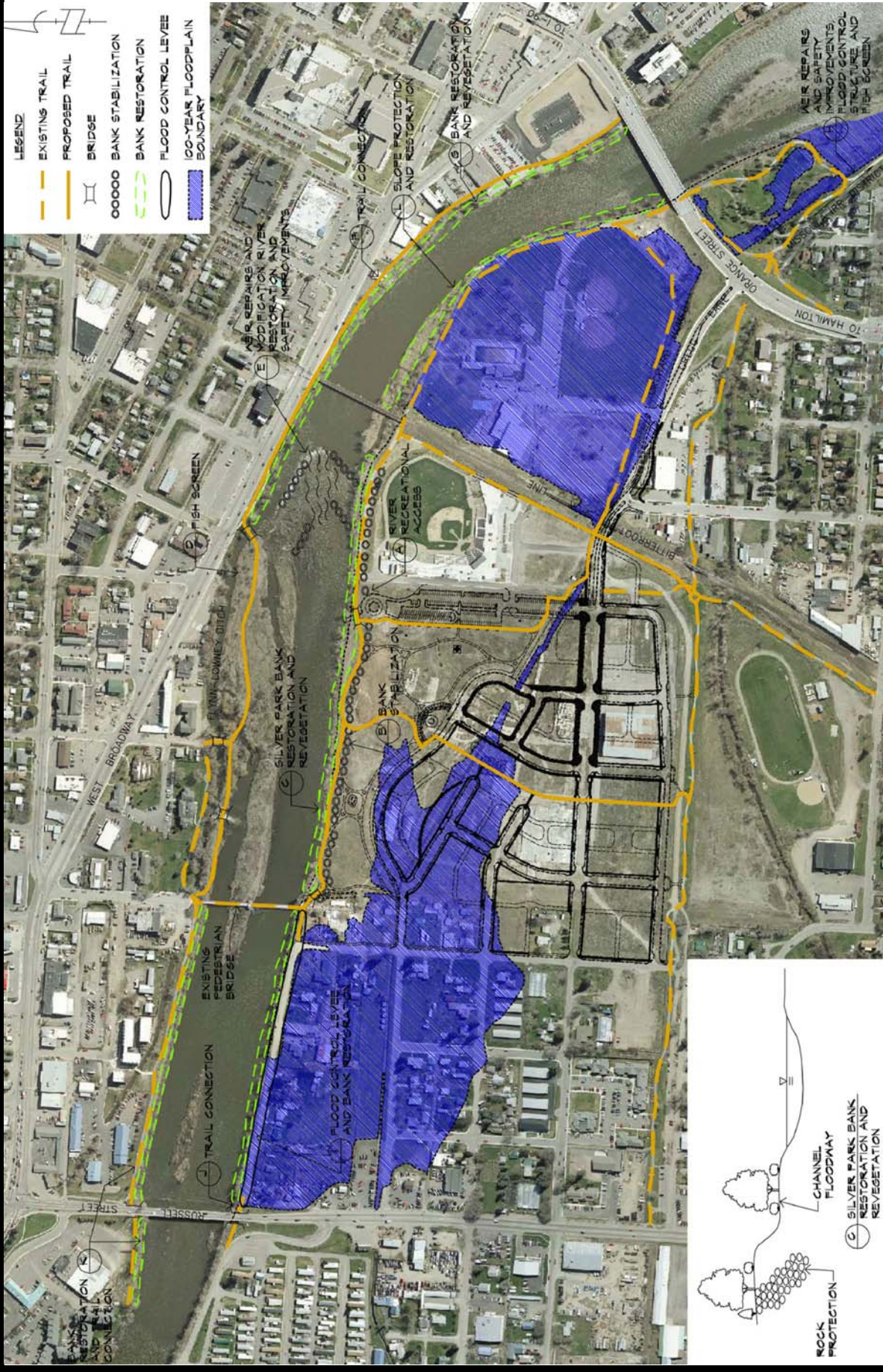
It is proposed to obtain a federal appropriation to fund a project led by the Clark Fork Coalition and the City of Missoula, along with other partners, to design the construction of riverbank restoration and recreation projects that will improve the connection between people and the river. Currently, the Clark Fork River's banks through the core of downtown Missoula are in dire straits from a century of urban neglect: concrete and asphalt, decaying rip-rap, old car parts, and steep, denuded banks characterize this two-mile stretch of the Clark Fork River. This revitalization project will be a model for urban river stewardship, featuring unique private-public partnerships that will generate restored riverbanks, community trails, re-planted riparian vegetation, fishing/boat access and interpretative lookout sites in front of downtown buildings. Figure 7 shows an overview of the project elements.

Attachment C includes a description of the project elements that will create a restored interface between the new homes and offices, city trails, and the Clark Fork River, and will benefit all residents of and visitors to Missoula. Innovative redevelopment projects on both the south and north side of the river are revitalizing the core of Missoula by creating mixed-use developments that include affordable housing, trails, and parks on previous industrial sites. Federal dollars will facilitate the removal of hazardous concrete and asphalt from the riverbanks, stabilization of

deteriorating banks, addressing deficiencies in existing levees, restoration of native riparian vegetation to improve water quality, creation of river access for citizens, and extension and improvement of existing pedestrian trails and riverfront parks along the Clark Fork River. This riverbank revitalization will highlight how urban redevelopment can complement and encourage river conservation and community recreation to create a healthier, more vibrant river and city.

Historic Downtown Infrastructure

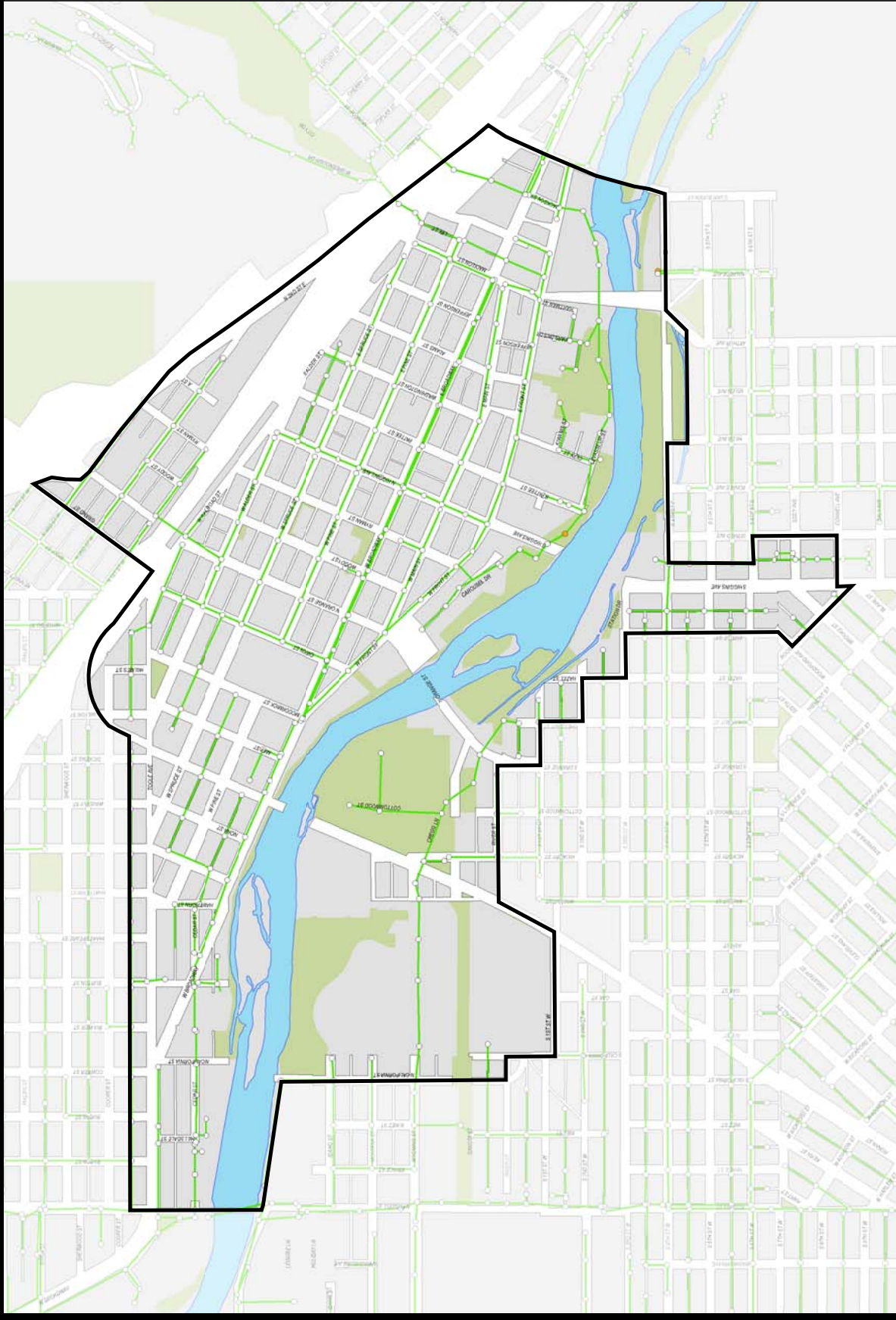
Missoula's historical infrastructure included a highly developed streetcar system and an early streetlight system that allowed one post card to describe Higgins Avenue as "The Best Lighted Street in America". Attachment D includes the report titled "*Missoula's Streetcars and Streetlights – An Historic Overview*", detailing this infrastructure, authored by local historian Allan J. Mathews. The report provides us with a helpful historic context for planning these important municipal facilities. One of the historic streetcars has been fully restored and is to be displayed at Fort Missoula. One can only imagine the additional character and charm our downtown would have if our city fathers had the foresight to keep the system running like those in some cities across the country. A similar historic streetcar system in New Orleans, Louisiana carries thousands of people every day to the historic neighborhoods surrounding the city. The system contributes substantially to the charm of the city and the quality of life of its residents.



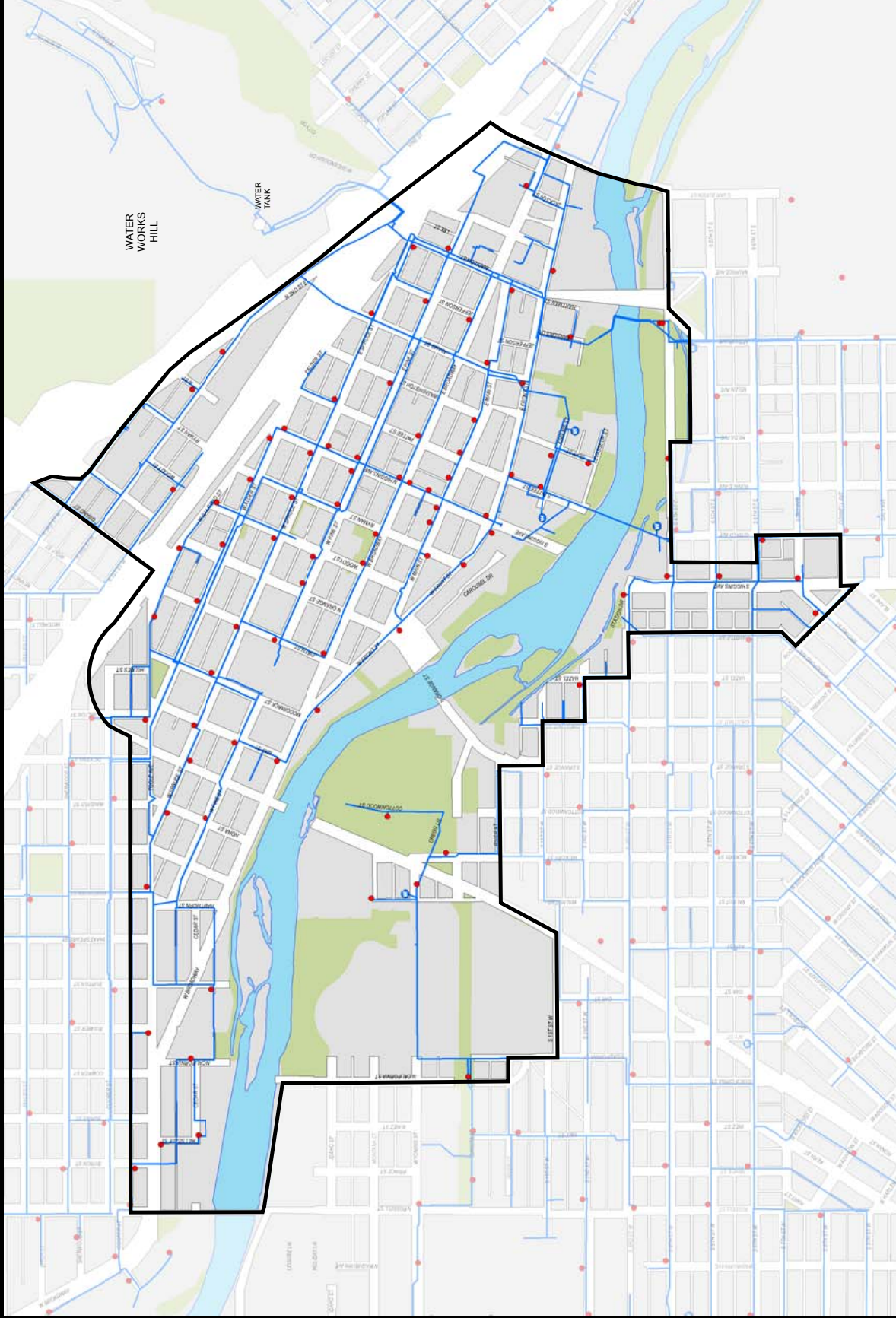


Attachment A – Infrastructure Maps

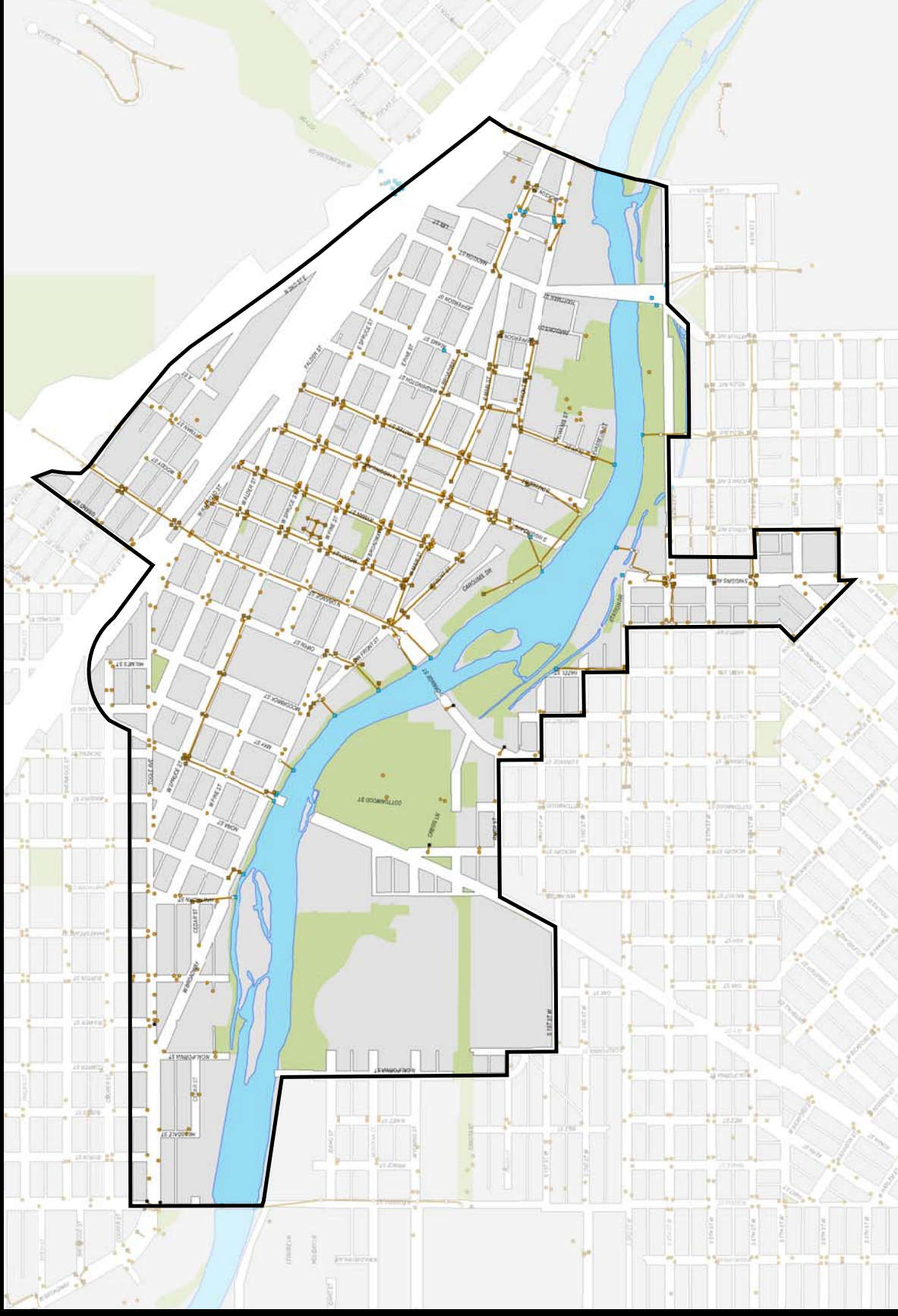
Sanitary Sewer
Drinking Water
Storm Drainage
Gas & Electric
Street Lighting Districts



- Public Works Department has high confidence in structural integrity of existing main due to recent camera surveys.
- A majority of future repairs will be completed through slip-line or pipe bursting procedures, not excavation.
- There is sufficient capacity for growth per the recent work on Caras Park lift station, and projections in the 2000 Missoula Wastewater Facilities Plan Update.
- The City's primary sanitary sewer concern is inflow infiltration (e.g. from leaking water mains). There are also concerns about the unknown inflows from roof drains (CSO).
- Front Street/ Orange Street realignment would require costly relocation of major sewer main; unsure sewer re-route at Front & Main will work due to grade issues.



- Mountain Water Company (MWC) will study in terms of storage, distribution, and transmission.
- Storage: likely will require increased storage, perhaps on Waterworks Hill, to meet fire and emergency storage needs.
- Potential improvements and/or upgrades to system:
 - 24" planned tie from Kiwanis Park to Parsons Drive
 - Possible railroad underpass on Ryman Street
 - Possible 12" connection from Gregg Lane along River to Gerald & 4th Street
 - Existing 6" main on West Front Street may need to be upsized for total capacity diagram build-out.
 - Additional looping & interconnect of system in some locations.
 - Front Street/ Orange Street realignment will require costly relocation of 6" main in Front Street to Main Street.
 - Modeling requires improvements to meet fire flows at Triangle Housing area and 1st Street Commercial area



- Legend**
- Storm Sewer
 - Outfall
 - Inlet
 - Drywell Sumps
 - Storm Sewer Manhole
 - Catch Basin

- Very little Public Works Department confidence in capacity or integrity of system. There are significant unknown conditions including lack of a size inventory.
- Locations of cross-ties to sanitary sewer unknown.
- Flood backflow concerns at Clark Fork River outfalls; O & M and positive mechanical control required.
- Storm Drain District is proposed for FY2010 to create a storm water utility aimed at capital improvements.
- Recent structures (e.g. the Fox Theatre site and 44 Ranch) are included in the O & M schedule.
- Parts of system collapsed & inoperable.
- Inlet structures antiquated & in need of replacement.
- Front Street/ Orange Street realignment would require costly relocation of major storm main; unsure storm drain re-route at Front & Main will work due to grade issues.

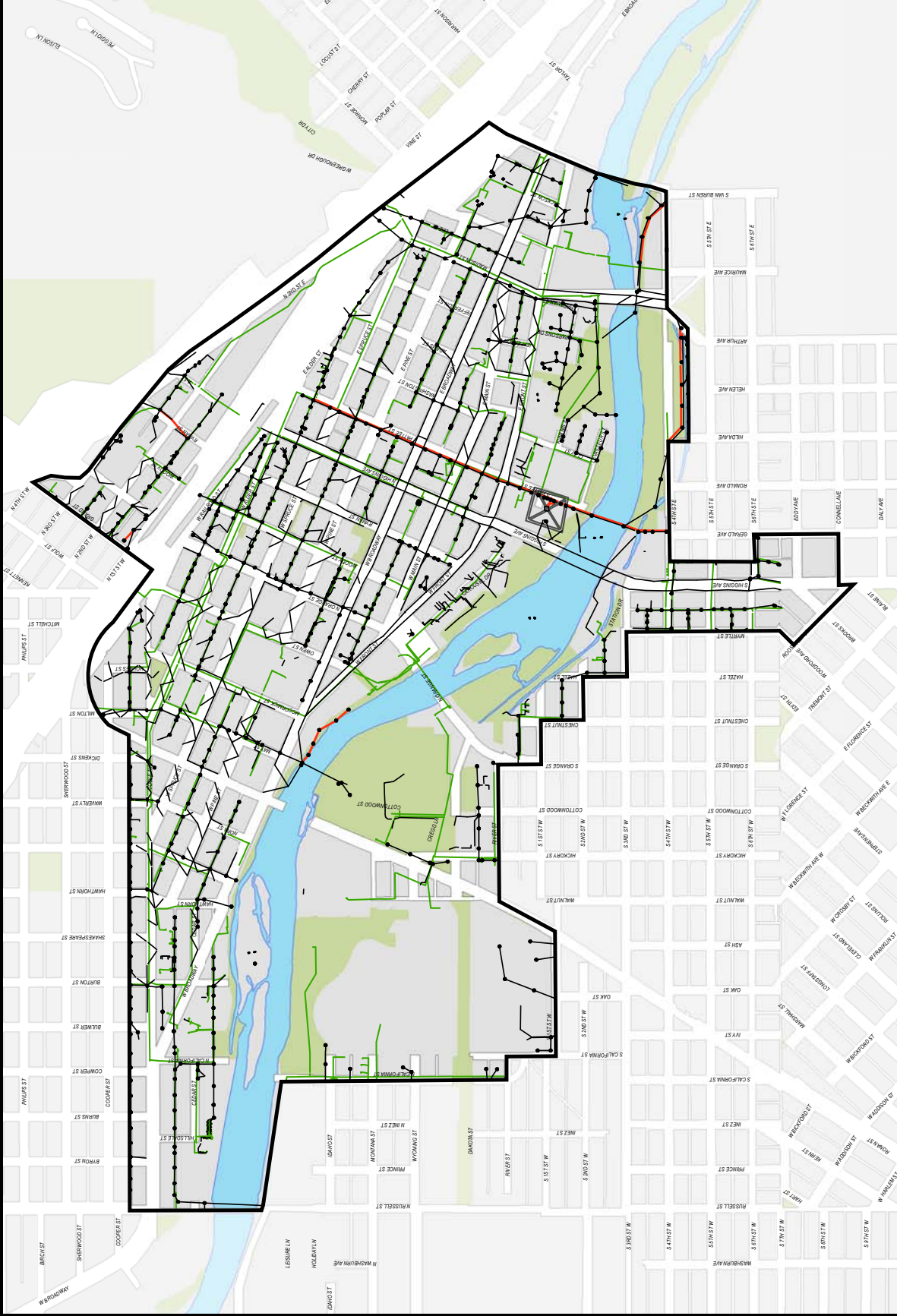
Downtown Missoula Master Plan

Missoula, Montana

Existing Utilities - Power & Gas

Figure A-4

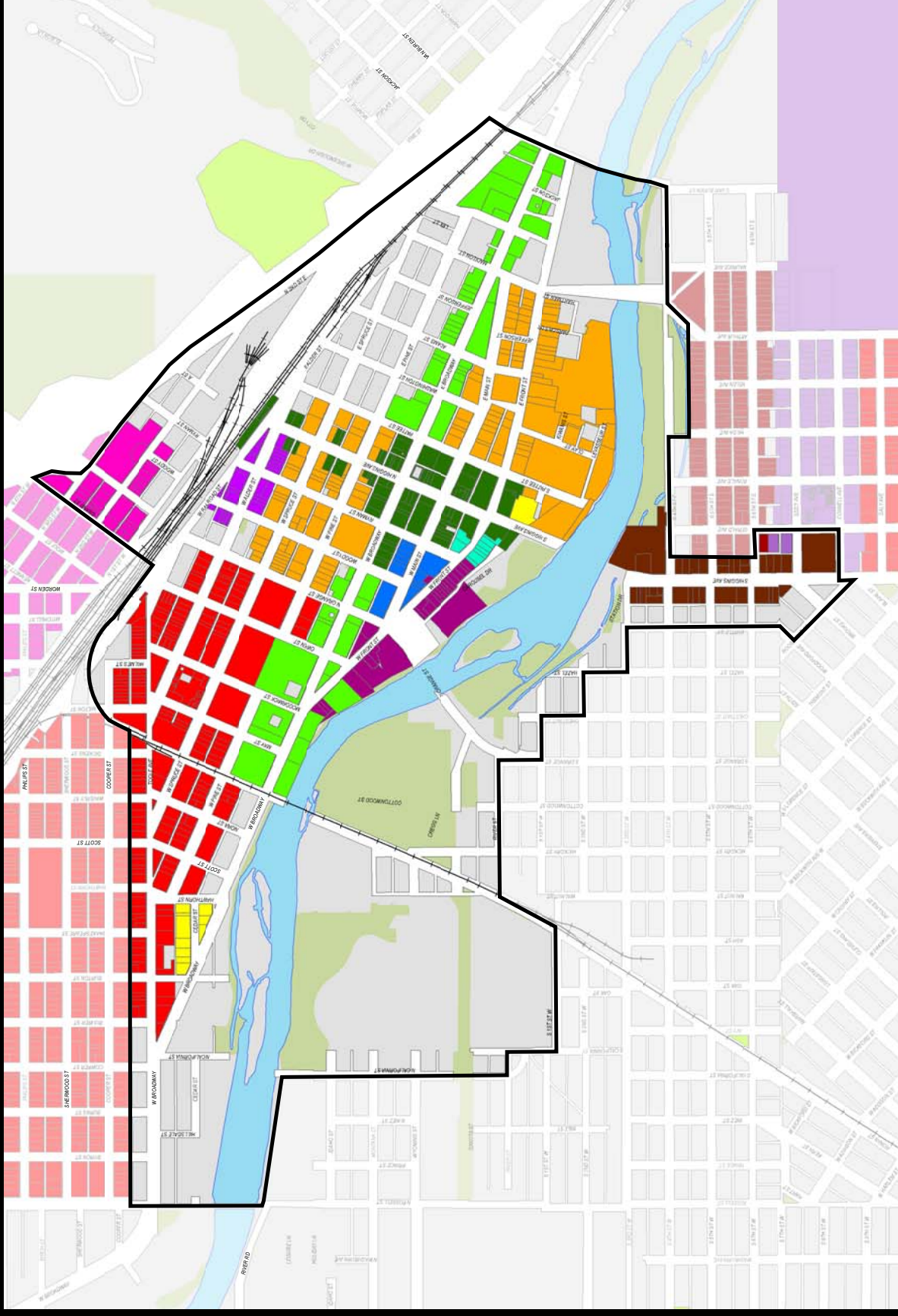
- NorthWestern Energy (NWE) has adequate gas & power facilities to support proposed Downtown Master Plan.
- Relocation of Substation #1 (S. Pattee St.) would be extremely costly.



Legend

- Gas Line
- Electric Line
- High Voltage Transmission Line

0 400 800 1,600 2,400
1 inch = 800 feet



- Two alternatives to upgrade poles and/or lighting downtown:
 - Form new street lighting districts
 - Re-assessment performed on existing districts
- Major City initiative for the downtown street plan is to create safer lighting patterns.
- Concern: if street lights are removed, must maintain power supply to traffic signals.
- NWE prefers customer-owned systems (although most are currently public) - maintenance could be addressed separately.
- NWE will soon have a greatly limited catalogue of poles & fixtures; currently standard steel poles cost approximately \$1400. Custom poles are significantly more expensive.



Attachment B – Project List

Transportation
Sanitary Sewer
Storm Drainage
Drinking Water
Parking Structures & Improvements
Parks & Squares
Summary

Attachment B – Project List

The following projects are recommended for implementation of the Missoula Downtown Master Plan. Programmatic cost allowances are included in 2008 dollars and are not based on design level detail.

Transportation

1. **Higgins Avenue** – Convert to 3 Lanes from Brooks Street to Railroad Avenue with streetscape, transit stops, street lighting, and underground overhead utilities. Include protected bikeways from 3rd to Railroad. Bike lanes from Brooks Street to 3rd Street. Include 3rd Street intersection improvements and traffic signal. Includes signal upgrades to accommodate protected bikeways. Cost Allowance: \$3.6 M
2. **West Broadway** – Convert to 4-lane boulevard street, protected bikeways on the south side of Broadway from Russell Street to Orange Street. Include streetscape, transit stops, street lighting, and raised and landscaped medians. Include new traffic signals at McCormick, Bitterroot Spur (pedestrian crossing), and Burton Street. Includes signal upgrades to accommodate protected bikeways. Cost Allowance: \$5.0 M
3. **Broadway/California Roundabout** – Replace signal at California & Toole, bike and pedestrian improvements, landscaping and lighting. Cost Allowance: \$1.2 M
4. **Front & Main Street** – Convert to two-way streets, including new signal at Madison and Front, Madison Street improvements, streetscape, and streetlights, diagonal parking where possible. Cost Allowance: \$1.5 M
5. **Front & Main Re-alignment** – Realign Front Street to accommodate new retail anchor including reroute of utilities. Cost Allowance: \$0.5 M
6. **Downtown Circulator Trolley** – Four-mile long fixed route trolley system circulating downtown from east to west along proposed employment center. Cost Allowance: \$80.0 M
7. **Greenough Drive Gateway & RR Crossing** – Pedestrian improvements and landscaping per neighborhood plan. Cost Allowance: \$0.25 M
8. **Pine Street Parkway & Art Walk** – Landscaping and raised medians, public art walk connecting to Missoula Art Museum, plaza at the Missoula Art Museum Cost Allowance: \$0.75 M
9. **Riverfront Trail Extensions** – Fill in gaps in trail connections on north side of river. Provide connections at Madison, Higgins, and Orange Street. Cost Allowance: \$ 1.5 M

- 10. Higgins Avenue Bridge Improvements** – Protected bikeways, enhanced connections to Caras Park, widened walkway, and Historic Street Lights. Cost Allowance: \$15.0 M
- 11. Non-motorized BN/MRL RR Undercrossing** – Cut and cover tunnel from Circle Square to north side for bikes and pedestrians, lighting & public art. Cost Allowance: \$25.0 M
- 12. Downtown Street Lights** – Historic lighting for sidewalks and street. Underground power supply where possible on all streets not included in other projects. Refinance existing RSID's. Cost Allowance: \$7.0 M
- 13. Downtown Streetscape** – Bulb-outs, hardscape, and landscape, tabletop intersections. Cost Allowance: \$25.0 M.
- 14. Blues Alley Improvements** – Alleyscape between Higgins & Ryman next to the Florence Building including entrance and lighting. Cost Allowance: \$0.5 M
- 15. Caras Park Gateway** – Gateway project on Front Street for Carousel and Dragons Hallow. Cost Allowance: \$0.5 M
- 16. Bitterroot Spur Bike/Pedestrian Crossing** – On or next to existing RR Bridge. Cost Allowance: \$1.5 M
- 17. Wyoming & Cregg Lane** – Extend new collector street from Russell to Orange Street with a signal at Orange Street. Cost Allowance: \$2.0 M
- 18. MRL Bridge replacement** – Replace Railroad Bridge for Wyoming Street Undercrossing. Cost Allowance \$1.5 M.
- 19. Alder Street Access Enhancement** – Left turn pocket on Orange Street for access to Alder Street. Cost Allowance \$ 1.5 M
- 20. Traffic Signal Progression & Pedestrian Countdown Crossing Indicators** – Provide vehicle and pedestrian detection at existing traffic signals. Replace existing walk indicators with countdown indicators. Cost Allowance \$ 1.0 M

Total Transportation Improvements: \$174.8 M

Sanitary Sewer

- 1. Storm Water Separation** – Separate storm and roof drains from sanitary sewer system including dye testing to locate problem areas. Cost Allowance \$0.8 M

Total Sewer Improvements \$ 0.8 M

Storm Drainage

1. **Main Replacements** – Replace storm drainage mains and intakes throughout downtown. Cost Allowance \$7.0 M
2. **Outfall Treatment** – Provide mechanical storm water treatment and prevent flood backflow at storm drainage outfalls. Cost Allowance \$0.5 M

Total Storm Drainage Cost: \$7.5 M

Drinking Water

1. **Main Extensions & Connections** – Complete network with infill and redevelopment. Cost Allowance \$ 10.0 M
2. **Wells** – Increase redundancy and maintain adequate fire flows and pressure with increased development. Cost Allowance \$ 5.0 M
3. **Storage** - Increase redundancy and maintain adequate fire flows and pressure with increased development. Cost Allowance \$5.0 M

Total Water Cost: \$20.0 M

Parking Structures & Improvements

1. **Front & Pattee Parking Structure**– Ground Floor retail and parking structure, 400 spaces. Cost Allowance: \$12.0 M
2. **Broadway & Orange Street Parking** – Ground Floor retail and parking structure, 500 spaces. Cost Allowance: \$12.0 M.
3. **Alder Street Parking Structure** – Parking structure for City County Buildings, 500 spaces. Cost Allowance: \$10.0 M.

Total Parking Cost: \$34.0 M

Parks & Squares

1. **Caras Park Enhancement** - Enhancements to compete park including public art, hardscape, landscaping and irrigation. Assumes existing water supply and right are adequate for irrigation. 135,000 s.f. softscape, 38,000 s.f. hardscape, 173,000 s.f. total. Cost Allowance \$5.0 M
2. **Kiwanis Park Enhancement** - Enhancements to compete park including land acquisition, public art, landscaping, and irrigation. Assumes existing water supply and right are adequate for irrigation. 152,000 s.f. Cost Allowance \$10.0 M
3. **Circle Square Enhancement** – Area south of existing Circle Square plaza including land acquisition, public art, landscaping, and irrigation, does not include bike/ped underpass. Assumes existing water supply and right are adequate for irrigation. 79,000 s.f. Cost Allowance \$15.0 M
4. **Silver Park Enhancement** – Enhancements to compete park including water feature and gazebo structures, landscaping, irrigation and water rights. 600,000 s.f. Cost Allowance \$10.0 M
5. **Depot Square** – New park north of the Railroad including land acquisition, hardscape, public art, landscaping, water rights, and irrigation, does not include bike/ped underpass. 40,000 s.f. softscape, 96k s.f. hardscape, 136,000 s.f. total. Cost Allowance \$10.0 M
6. **Clark Fork River Restoration Project** – Restore Clark Fork River from Russell Street to Orange Street including bank restoration, flood mitigation, irrigation weir repairs and fish screens. Cost Allowance \$5.0 M

Total Parks Improvements: \$ 55.0 M

Summary

Transportation Improvements	\$ 174.8 M
Sewer Improvements	\$ 0.8 M
Storm Drainage Improvements	\$ 7.5 M
Water Improvements	\$ 20.0 M
Parking Improvements	\$ 34.0 M
Parks Improvements	\$ 55.0 M
Total Investment	\$ 292.1 M



Attachment C – Clark Fork Revitalization Project

Attachment C – Clark Fork Revitalization Project

Project Elements

Site A: River Recreational Access (Southside Riverbank Project, Silver Park)

This project will construct new access to the Clark Fork River in the form of a boat ramp at Silver Park. No boat access to the Clark Fork is currently available near downtown Missoula, the second largest city in Montana, which would benefit greatly from enhanced recreational opportunities for residents and tourists. This project will also complete a critical piece of the Ron McDonald Riverfront Trail. The trails to be constructed through Silver Park will connect existing riverside trails on the south bank of the Clark Fork River, including an important linkage to the California Street pedestrian and biking bridge that crosses the river one-half mile west of the park. Cost Allowance: \$500,000

Site B: Bank Stabilization (Southside Riverbank Project, Silver Park)

The City of Missoula is working with a private development group to redevelop a 45-acre former mill site (an EPA-designated brownfield site) in the core of downtown Missoula into a mixed-use neighborhood. While the old lumber mill was in operation, the riverbank was stabilized using large chunks of concrete and asphalt. The Army Corps of Engineers has since built several levees to protect the developed areas in the event of a flood. These levees are all currently Corps-certified and maintained by the City of Missoula. However, the leftover concrete, asphalt, metal, and wood components from previous non-Corps bank stabilization techniques create an unsafe, unsightly, and an unfriendly recreational riverbank. This project seeks to stabilize the banks using buried rock protection in conjunction with the restoration project described in Site C. Cost Allowance: \$750,000

Site C: Bank Restoration and Revegetation (Southside Riverbank Project, Silver Park)

As the City of Missoula works with a private development group to redevelop the 45-acre former mill site (an EPA-designated brownfield site) described in the prior section, the riverbank along the proposed Silver Park and existing Missoula Osprey baseball stadium will be restored and revegetated. This project is an opportunity to create a safe, pedestrian-friendly, restored and revegetated riverbank by benching the bank. The benefits of the river benching project include improved fish habitat, decreased river velocity in the case of a ten-year flood through the newly provided vegetated floodway channel, and increased river access to the public. Cost Allowance: \$600,000

Site D: Flynn-Lowney Irrigation Ditch Fish Screen (Diversion Improvement Project Development)

This project seeks to install a fish screen at the intake where the Clark Fork River feeds the Flynn-Lowney Irrigation Ditch. Currently, fish frequently enter the irrigation ditch, resulting in

increased fish mortality. By installing a fish screen at the diversion, a positive barrier will be provided to ensure long-term protection of the Clark Fork's fishery resources.

Cost Allowance: \$150,000

Site E: Flynn-Lowney Irrigation Ditch Weir Repairs and Modifications, River Restoration and Safety Improvements (Diversion Improvement Project Development)

The Flynn-Lowney diversion is a rock-and-concrete structure that juts into the river, impacting water quality and the safety of river users. This project will initiate discussions with the diversion owners and water users to potentially develop community-supported alternatives to improve the river at this diversion. As previously agricultural land is converted into residential neighborhoods, many Missoula water right holders no longer need their water rights solely for irrigation. As such, some of the water users from these diversions have expressed interest in negotiating with the City, State, or private non-profit organizations to sell or lease these water rights for in-stream flow, or determine alternative means of acquiring irrigation water, such as installing groundwater pumps. Improving or removing this diversion structure from the river would enhance water quality, and provide safer river recreation for boaters, swimmers, and trail-users along the Clark Fork. Cost Allowance: \$350,000

**Site F: Trail Connection
(Northside Riverbank Project)**

Pedestrian commuters, fishers, kayakers, wildlife-viewers and swimmers have all requested better access to the Clark Fork River in downtown Missoula, especially on the northside of the river, which lacks trails or any safe access to the water. No access point or trail currently exist on the northside of the Clark Fork, beyond Caras Park, located downtown. Building 1.5 miles of trail west from downtown's center along the northside of the Clark Fork will allow pedestrians an alternative to commuting on Broadway, one of Missoula's busiest arterials, which parallels the river.



This project will make a critical connection in the Ron McDonald Trails System on the north side of the river. Commonly (but mistakenly) called an island, the parcel extends from just south of the bank of the Clark Fork River near 1111 West Broadway to California Street and the California Street Pedestrian Bridge. The parcel is surrounded by water with the river on the south and the Flynn-Lowney Irrigation Ditch on the north. Because an irrigation ditch is not a recognized natural waterway, the parcel is legally viewed as part of the bank. Some portions of the "island" are in the 100-year



floodplain; others are in the floodway. A significant area of the parcel is covered with shrubs, trees, and tall grasses. A bridge crossing the irrigation ditch connects the parcel to the south end of Burton Street providing a crossing for vehicles maintaining the ditch intake. The project planning and development for this trail would envision accessing the island trail via the existing bridge on its east end, and construction of a second bridge to link to existing pedestrian facilities on the west end. Cost Allowance: \$550,000

**Site G: Bank Restoration and Revegetation
(Northside Riverbank Project)**

This project seeks to provide bank restoration and revegetation along the north bank of the Clark Fork River between the Flynn-Lowney Irrigation Ditch “island” and Orange Street. Currently, a majority of these banks are poorly vegetated and/or rip rapped with concrete and other debris. By restoring the banks, better habitat will be provided for local flora and fauna. Cost Allowance: \$600,000

**Site H: Missoula Irrigation Ditch Weir Repairs and Safety Improvements
(Diversion Improvement Project Development)**

The Missoula Irrigation Ditch diversion is a rock-and-concrete structure that juts into the river, impacting water quality and the safety of river users. Similar to the project at Site E (the Flynn-Lowney Ditch), this project will initiate discussions with the diversion owners and water users to potentially develop community-supported alternatives to improve the river at this diversion. Improving or removing this diversion structure from the river would enhance water quality, and provide safer river recreation for boaters, swimmers, and trail-users along the Clark Fork. Cost Allowance: \$250,000

**Site I: Flood Control Levee and Bank Restoration
(Southside Riverbank Project)**

The goal of this project is to repair and expand the current levee along the residential neighborhood located between California Street and Russell Street, and improve flood protection for a 2,500-length of shore upstream at McCormick Park. Developed after a federal levee was placed along the bank after a 1948 flood, the California Street residential community was placed in the 100-year floodplain after analysis in the 1980s. In order to address sprawl, air quality, and traffic congestion, the City of Missoula prefers to “grow inwardly,” and encourages infill development for many neighborhoods, including this one. Unfortunately, future infill development along this portion of the Clark Fork is currently due to concerns about and regulations regarding potential flooding. The impact is exacerbated by recently adjusted floodplain boundaries. This levee repair and extension project will reduce safety concerns and floodplain-related financial hardship for future growth and development in this neighborhood. Uneven and non-uniform riprap currently acts as flood prevention (not Corps of Engineers-related) along McCormick Park, which houses city recreation/game fields, a public pool, and park and picnic facilities. Slope protection and enhancement will better protect these important community assets from potential river flooding. Cost Allowance: \$650,000

**Site J: Trail Connection
(Southside Riverbank Project)**

This project will provide a trail connection under the Russell Street bridge on the south side of the river. A busy arterial with no safe pedestrian or bicycle access, this project will result in a high volume of recreational and pedestrian use, as well as increased river access. Cost Allowance: \$100,000

**Site K: Bank Restoration and Trail Connections
(Northside Riverbank Project)**

Manipulated by various landowners and agencies over the years, the river's current bank at this location has a steep 15-foot drop with debris scattered throughout the manmade fill that was imported decades ago. This configuration creates problems due to pesticide runoff, increased sedimentation and siltation, and a loss in river function. This project will include riverbank grading, designing and constructing a riverfront trail, landscaping, planting and revegetation, an interpretive lookout over the river, and removing debris and excess fill to restore the riverbank to a natural, graded slope that will buffer



against flooding and protect wildlife habitat and water quality. This project will also feature an inner pedestrian walkway through the development to provide public access to the river. Because this site is on the corner of two of the main traffic thoroughfares in town, Russell Street and Broadway, it will receive a high volume of recreational and pedestrian use. Therefore, it is important that the trails and riverbank are made safe and accessible to accommodate the multiple users who will frequent this newly redeveloped site. Cost Allowance: \$200,000

**Site L: Slope Protection and Restoration
(Southside Riverbank Project)**

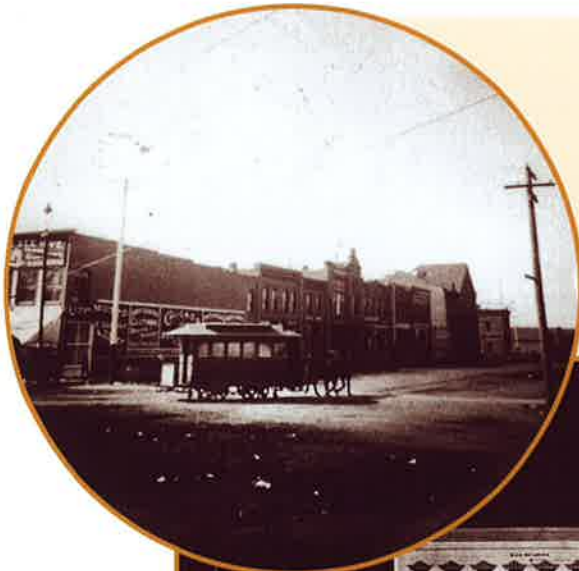
This project seeks to provide bank restoration and revegetation along the south bank of the Clark Fork River along McCormick Park toward Orange Street. Currently, a majority of these banks are poorly



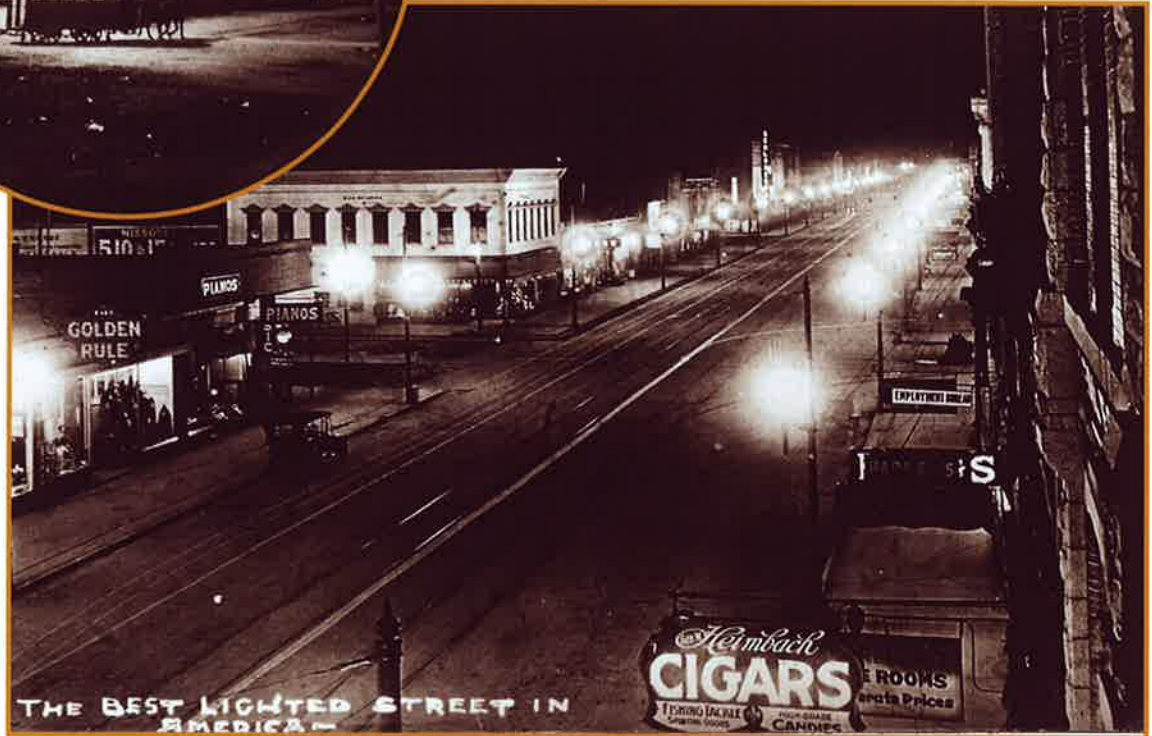
vegetated and/or rip rapped with concrete and other debris. By restoring the banks, a better habitat will be provided for local flora and fauna. Cost Allowance: \$300,000



**Attachment D – Missoula’s Streetcars and Streetlights
An Historic Overview**



MISSOULA'S STREETCARS AND STREETLIGHTS AN HISTORIC OVERVIEW



FOR WGM GROUP
MISSOULA, MONTANA
APRIL 2008

**MISSOULA'S
STREETCARS AND
STREETLIGHTS
(An Historic Overview)**

For WGM Group
Missoula, Montana

April 2008

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Missoula's Streetcar System

In 1888, in Richmond, Virginia, Frank J. Sprague advanced street railway technology beyond cable and steam by building a system operated by electricity. Daring entrepreneurs in Montana followed Sprague's lead when on July 13, 1889, Richard A. Harlow and Donald Bradford applied for a franchise to build the Helena West End Electric Railroad. The attempt failed. But within three years Helena and five other Montana cities had electric systems -- Missoula, Bozeman, Anaconda, Great Falls, and Butte. ⁱ

Missoula's first attempts at establishing trolley service were chaotic to say the least. Everyone wanted in on the new game of providing modern transportation to the public. The Missoula Street Railway Company, franchised in March of 1889 and incorporated in July of that year found itself facing delays in getting the system fully operational. While it struggled to get started, the Missoula City Council granted four more franchises for lines running in other parts of the city. Some of Missoula's most influential businessmen received the franchises, including lumber baron Thomas L. Greenough, W.M. Bickford and F.G. Higgins, among others. ⁱⁱ



Horse-drawn trolley on corner of Higgins & West Main Street
(All of the photos in this manuscript courtesy of Stan Cohen,
Pictorial Histories Inc.)*

A horse-drawn trolley, driven by Joseph Solomon in 1892, came to be known as "Solomon's Southern." Local Advertisements, portrayed electric trolleys shortly thereafter and it is certain that such a system was in operation by February of 1893 because the motormen of the Missoula Electric Street Railway Company went on strike. The system must have been popular by then as *The Missoulian* reported scenes of inconvenienced and stranded shoppers and businessmen. In a perhaps sensationalized account, an article of February 22, 1892 stated that, "The restaurants and hotels and spacious waiting rooms of the M.M. Co. were crowded to overflowing all evening."

Two years prior to electrification, Missoula had started a horse drawn trolley system with tracks running from the first Northern Pacific depot, which was located just west of the north end of Woody Street and Railroad. The track ran south to Front Street, east to Higgins, north to Main, west to Woody and then back to the depot. A barn near the corner of West Broadway (then known as Cedar) and Woody Street housed the streetcar and served as a stable and repair shop. An extension of the line over the Higgins Avenue Bridge, brought service south of the river by 1895.



Laying the tracks for Missoula's streetcar line to Fort Missoula

Though advertisements in *The Missoulian* depicted overhead, electric trolleys, "The Solomon Southern" horse-drawn line was still operating in 1897. An article in *The Missourian* on February 15, 1897 described troubles confronting the operation of the system as follows: "The Solomon Southern street car line is having a siege trying to keep ice off the track. In places the roadbed has become completely submerged with water, which has frozen solid, making it necessary for the cars to run upon the ice... This does not prevent the cars from making regular trips."

Continued deterioration of the tracks caused delays through the spring and summer of 1897, and when the city council replaced the planks of the Higgins Avenue Bridge, the rails were removed and not replaced. Thus, streetcar service came to an end.

The end of the first trolley system produced expected results. *The Missoulian*, of October 4, 1897 reported that: "Now that the street car track is torn up the students [at the new University of Montana] are wondering how they will get to the university in bad weather. If there was some means of rapid transit to and from the city, at regular intervals, the system would be largely patronized. What is needed is an electric system that will transfer people quickly..."ⁱⁱⁱ

Behind the scenes, much effort was being put forth to provided the much-needed public transportation for a growing population that had become accustomed to it. However, it took four years before it looked as if a solution was near. On October 11, 1901 *Missoulian* headlines proclaimed: "AN ELECTRIC RAILWAY. Missoula May Have One Before Many Months." Within a month, on November 5, the editor trumpeted: "TWO STREET CAR COMPANIES."^{iv} However, in reality, a system would not to be realized for many years.

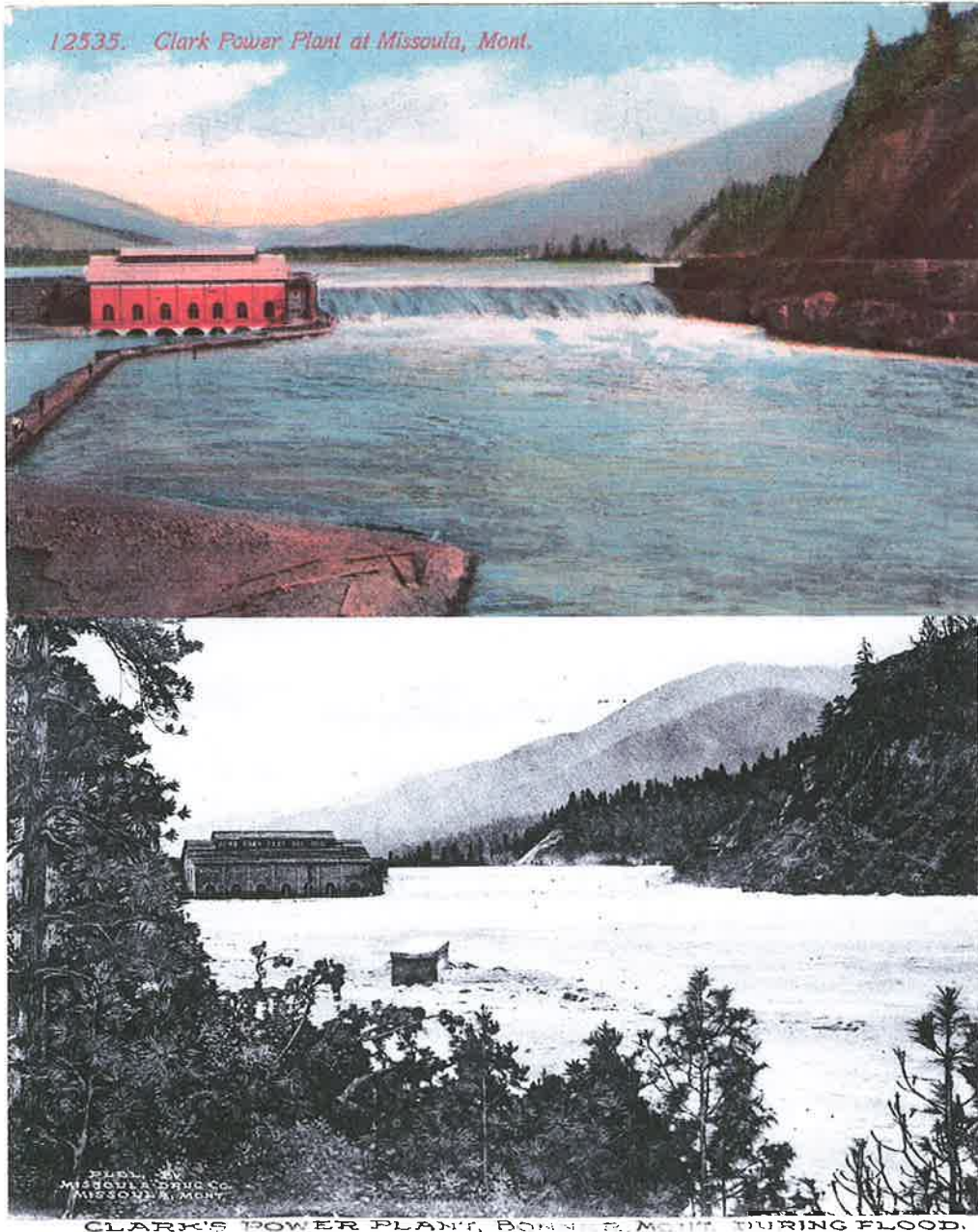
During the next six years, the subject of a new street railroad never left the public forum, with lively city council meetings and fiery editorials arguing the merits of every plan proposed. By 1903, three separate groups applied for franchise rights. Still, not one succeeded in incorporating, let alone in breaking ground for a new system. Such an endeavor required very deep pockets, something lacking in local investors. Nevertheless, there were vast fortunes being made in Butte copper, and the latest of a string of "Copper Barons," William A. Clark, eventually turned his attention to investing in western Montana and in particular, Missoula.



Streetcar meets horse & wagon – Higgins Avenue & Front Street

By 1907, Clark was a U.S. Senator and had a vast fortune to invest. Never one to think on a small scale, the senator came up with a plan for a trolley that would run hundreds of miles from Hamilton in the Bitterroot Valley through the Blackfoot to Great Falls. Missoula would have a substantial system to link the Bitterroot line to the Blackfoot. The following year, H.R. Wharton, Clark's representative filed for a franchise for a new street railroad in Missoula. Most everything that Clark did was political and the city council passed the request on to the public with a special election that gained Clark his franchise.^v

During this same time period, William Clark began building the largest dam in western Montana just east of Missoula. Clark's dam would serve as the source of electricity for the streetcar system, streetlights and all of the general power needs of the growing city. As the dam neared completion in 1908, a flood breached it, causing considerable damage and a setback to Clark's schedule for bringing streetcars back to Missoula.



Clark's Dam (Milltown Dam)

Clark and his associates incorporated the Missoula Street Railway Company on January 20, 1909 and began construction of 2.5 miles of rail bed for an interurban railway from Cedar Street (Broadway) to East Missoula. It was also necessary to construct a trestle across the Rattlesnake River at the east end of Pine Street and another near East Missoula.

By the spring of 1910 the system was nearing completion and excitement filled the air. On May 12, 1910 *The Missoulian* reported the long-awaited news: "The joyful news emanated from the headquarters of the street railway company

yesterday..." 'Get Your Nickel Ready.' This is a rule of utmost importance!" Missoula finally had its modern trolley system.



A pedestrian stands in amazement as the new trolley vies for space with horses & wagons (corner of Higgins & Pine Street)

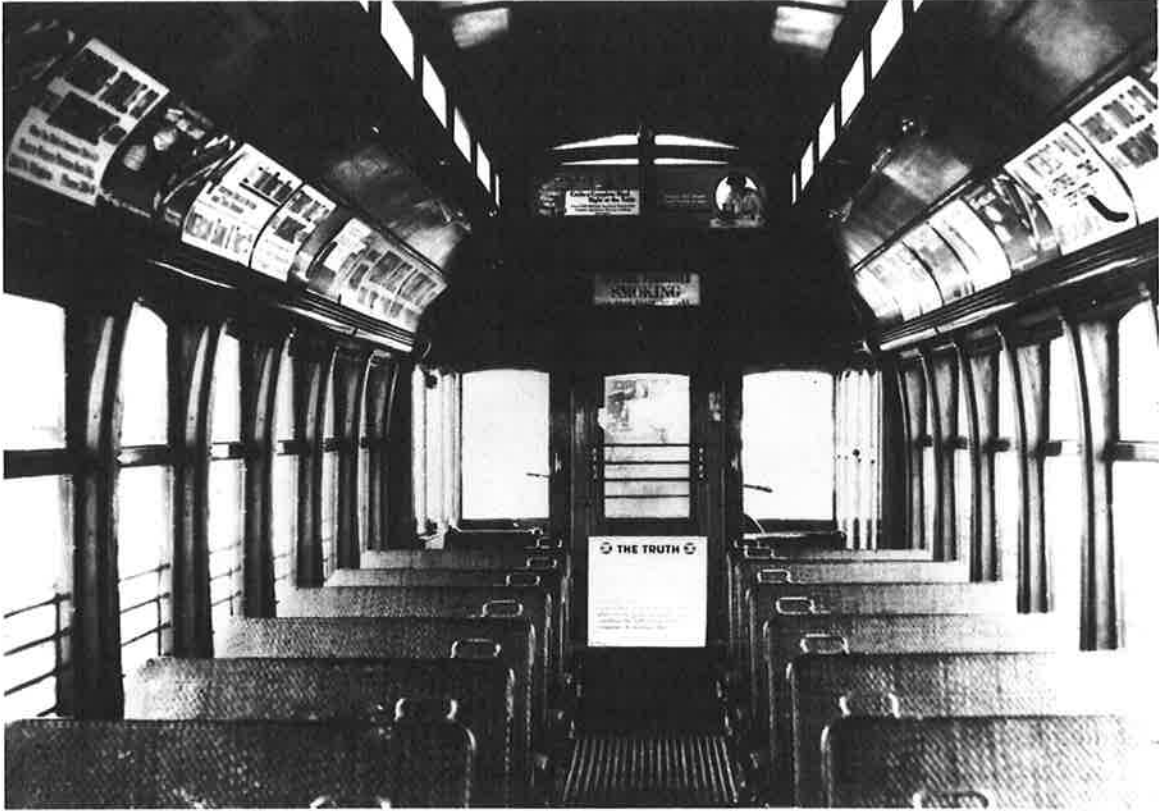
The trolley cars, manufactured by the American Car Company of St. Louis, a subsidiary of the Brill Company, the firm that provided cars for other systems throughout the country, were as modern as you could get -- requiring just one employee to operate. Three Brill semi-convertible cars arrived for the inauguration of service on May 11, 1910, and ran on 15 miles of track from the car barns, across the Higgins Avenue Bridge, and past the University campus, causing a disruption of the state track meet. "The mile run was in progress on Montana Field when the first car passed the university and the sight of the new coach nearly broke up the track meet: there was a stampede from the bleachers and there were cheers for the railway. Missoula has been patient in the matter of electric railway operation..."^{vi}



The band welcomes the Bonner Streetcar on Cedar (Broadway) 100 Block East

The initial run encompassed approximately 22 miles including the trip across the Rattlesnake Creek Bridge and out and back from Bonner. The following day three cars were used to provide service for the track meet crowds. Seeing the success of the initial runs and subsequent embracing of the new system by Missoulians, William Clark increased the capital stock of the company from \$100,000 to \$500,000 and set about expanding the track to 18.5 miles and adding seven new cars of the same make as the first three cars.^{vii}

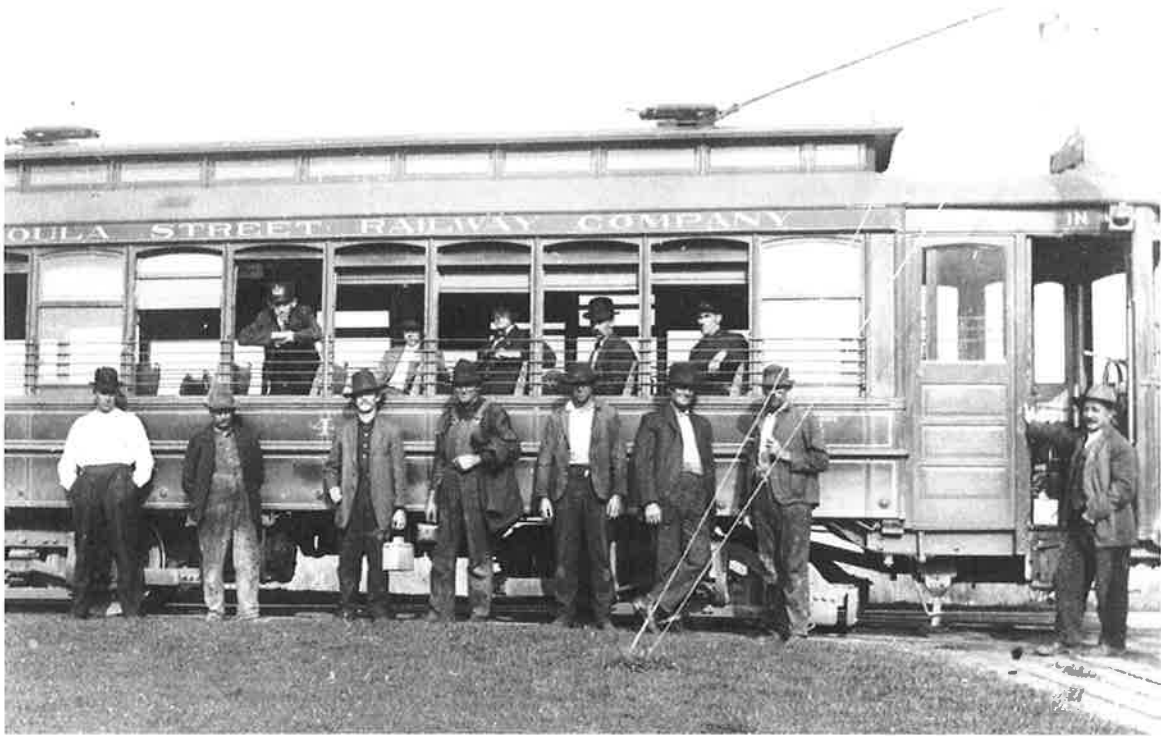
Each of the Brill streetcars, outfitted with cane seats that could be flipped over to face the opposite direction, carried 40 passengers. As the motorman pulled the door lever, a step folded down to provide easy access for the passengers. Dressed in uniforms of their own purchase, the motormen held a powerful position, especially when blasting the foot-operated bell to get the attention of pedestrians, and through the years, increasing numbers of motorists. The bell was said to be "of frightening volume."^{viii}



Brill Streetcar interior - Missoula



Streetcar #2 served the Daly Addition south of the Clark Fork River



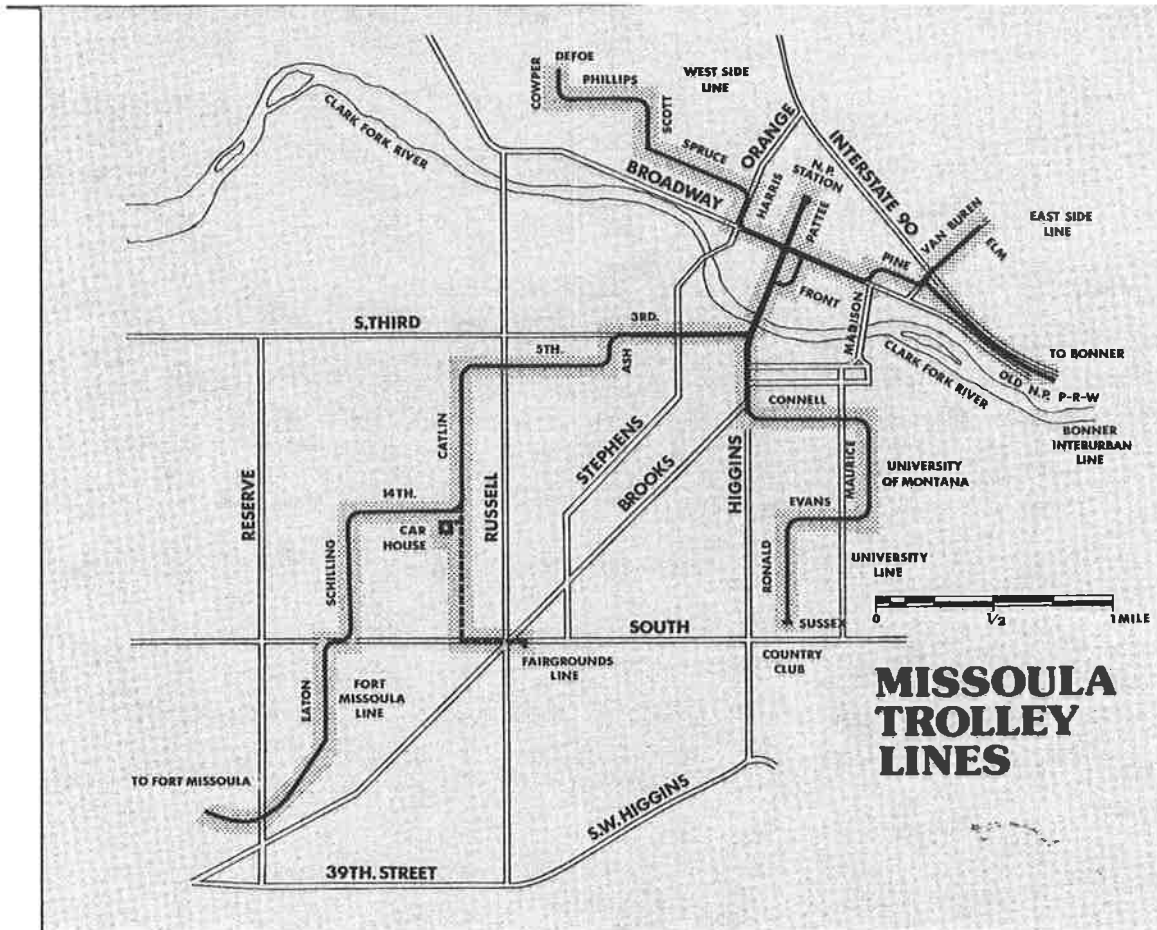
Streetcar conductor and workers

The clang of the trolley bell became a familiar sound to Missoulians for the next two decades. At its peak, the system had 10 cars and provided excursions and special trips to Bonner and Riverside Park near Milltown. Public relations were served well when extra runs were added when the circus arrived in town. In 1911, The West End line opened, carrying passengers to the fringe of town. It was extended later to serve the sugar beet factory and another short extension took passengers to the fairgrounds.^{ix}



Double track along Cedar (Broadway) allowed the trolley line to serve the "West Side" of Missoula

Passengers could expect to wait 20 minutes between streetcar arrivals. This was cut to 15 minutes for a time, but that proved impractical. Ten-minute service was available between Higgins and Broadway and the University with the help of a third car operating along the University line. Just about any part of Missoula could be reached by taking the streetcar system.^x

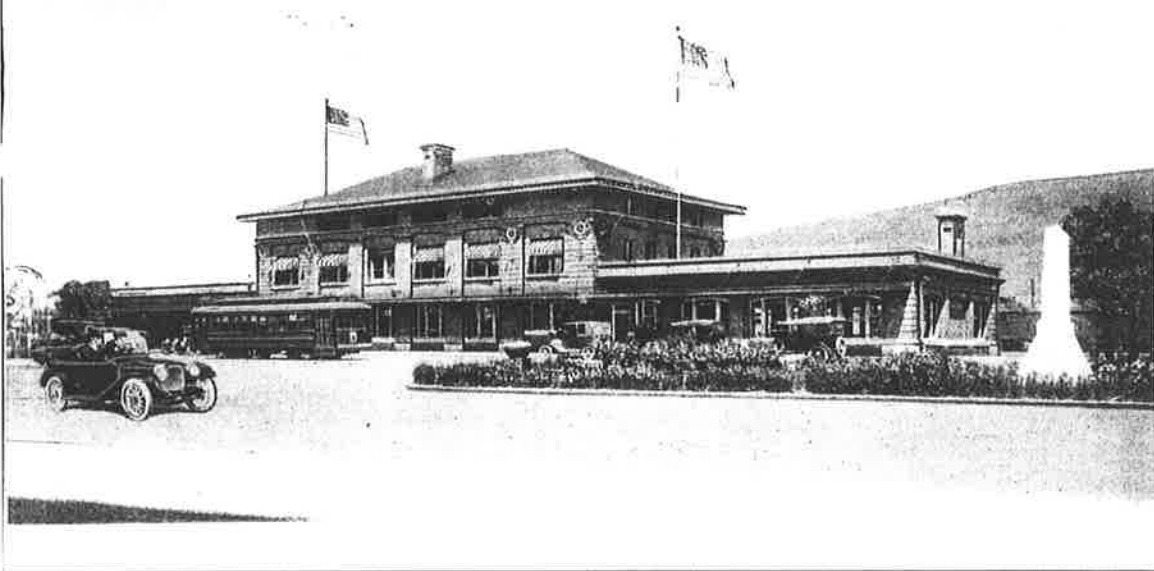


Map from Montana Historian, March 1976

The Missoula trolley system was operated by the Missoula Street Railway Co., a subsidiary of Missoula Light and Water Company from 1910 until 1924. That year, the Missoula Public Service Company took over operation, and Montana Power Company purchased the company in 1928. Achieving its peak number of riders in the early 1920, the Missoula system, with its single motorman-conductor set-up, was considered one of the most efficient lines in the country and became a model for other cities to emulate.^{xi}

Despite its general efficiency, the streetcar system faced competition from its very beginning from the automobile. With mass production, automobile numbers rose dramatically during the first two decades of the Twentieth Century. By 1932, economics resulted in the demise of the streetcar system in Missoula. Passenger numbers had fallen to a degree that the system was losing ever-increasing dollars, and a general feeling of irritation by automobile drivers, who now claimed the streets as their own, translated into the end of the grand experiment in public transit.

1130. N. P. Depot, Missoula, Mont.



With only a few cars on the streets, competition for space was no problem during the early streetcar days.

On January 24, 1932, Montana State "Grizzlies" band serenaded the last passing trolley run. Two days prior, *The Daily Missoulian* had expressed its view of the situation as follows:

"In the 22 years of its operation, the railway has never paid a dollar on the investment." then continued: "No one is at fault, no one to blame except, perhaps, the ninety-five per cent of Missoula citizens who didn't patronize the cars while they were operating on regular schedules every day in the year... Even though they didn't patronize them while they were available, Missoula citizens undoubtedly regret to see the cars disappear. They gave a decidedly metropolitan air to this little city of ours. Those who live on or near a car line receive a substantial amount of comfort at the sound of a car rattling past. When the last rolled by on its way to the barns somewhere around midnight, one felt that night had finally settled down and that it was time to turn in."^{xii}

As the last trolley reached the end of the line, a crowd gathered. Dean A. L. Stone of the School of Journalism read a statement of appreciation and presented motorman, George Richards, who had ridden on the first trolley run of 1910, with a "fine fishing pole." Bus service began the next day.

In 1935, most of Missoula's streetcars were sold to Sam Mercer, who operated a tourist "Motor Park," on the northwest part of town on Sherwood Street, where they were converted into tourist cabins. Two of the summer cars were sold to T.K. Thompson for a similar purpose. The remaining stock, consisting of the locomotive, a work car and seven flatcars, was sold to various sources during the following two years.^{xiii}



Missoula's Historic Streetlights

Missoula has had a number of streetlight designs throughout its history. However, the General Electric 6.6 ampere, inverted, luminous arc lamps installed in 1912 on bracketed posts rising 18 feet above the street, were by far the most elegant. Manufactured by the General Electric Company of Schenectady, New York, they represented "the last word to date in first class lighting." So proudly received, that they inspired postcards proclaiming Missoula, "The Best-Lighted City in America!" these lights and stanchions endured into the 1950s and became one of the symbols of downtown Missoula. Nothing before or after has equaled the beauty of their design.

The story of Missoula's most impressive streetlights is told in great detail in the following *Missoulian* article of December 12, 1912.

**Missoula The Best-Lighted City in the World!
So Experts Declare After Viewing the Municipal Betterment of
1912**

Let there be light!



Thus spoke the people after due thought and consideration had been given the proposition which was presented to them by the Missoula Light and Water company, the decision having been reached after many meetings and conferences. Opinion was divided at first and there were some strong objections to be overcome. But the proposition was fair. The spirit of municipal improvement was in the air, and finally the proposition submitted was adopted by an overwhelming majority of the property holders interested. Let there be light, said the people. And there is light, pure, white and glowing, and as it shines and makes bright as day the city's business section, Missoula sits back and boasts of three of the best-illuminated thoroughfares in the United States. It is not an idle boast, for there are facts and figures available to prove the statement to be absolutely correct. There are cities with a greater number of similar lights in use; there are cities, which have spent thousands for a more artistic arrangement of

ornamental posts and clusters; but there is not city that has a district of equal size as well lighted as Missoula. By its adoption of the plans Missoula will always enjoy the distinction of being the first city west of the Mississippi to have installed the new lamps—the latest thing in street lighting that is known. Other cities have as great a number of the same magnetite arc lamps within the same space, but most of these are set on brackets only 14 feet from the pavement. Missoula's lamps are 18 feet above the street. This takes them up above the range of direct vision of pedestrians and makes the diffusion more perfect. A street set with these lamps has a dignified appearance. The comparison between Missoula's system and those of other Montana cities where generally any attempt at special lighting has been carried out with tungsten clusters, gives the Garden city a striking advantage. As beautiful as are the lights in both Great Falls and Kalispell, they grow dim and weak when, in the mind's eye, they are brought face to face with Missoula's new lamps. In every way the local plan has proven to be the best. Higgins avenue and several blocks of Front Street and Cedar Street have been equipped with the new pole lamps and the effect is more than was expected and all that could be asked.



Postcard extolling the beauty of Missoula's new streetlights & streetcars
(ca. 1914)

The lights of which Missoula is now so proud are known as the 6.6 ampere, inverted, luminous arc lamps. They are manufactured by the General Electric Company of Schenectady, New York, and represent the last word to date in first class lighting. Each lamp gives an actual candle power of 1700 c.p. And consumes about 600 watts of electricity. This compares very favorably indeed, with five-light Tungsten lighting, where only 400 c.p. is obtained for a current consumption of 500 watts. It is seen therefore, that for a very slight increase in current consumption, more than four times the amount of light is obtained for

each of our new lamps than is furnished by the five-light tungsten post cluster, such as are in use in other cities of the state, and in places like Minneapolis, Spokane, and Seattle. Indeed, so tremendous is the improvement in street lighting offered by these new lamps, that it may be confidently stated that no considerable tungsten post lighting systems will hereafter be installed in the downtown sections of any progressive city. Tungsten lighting, however, will continue to be popular for street lighting in residential districts, particularly in places where one or two lights per post will give sufficient illumination.

Missoula has the distinction of being the first city west of the Mississippi to adopt these new lamps. The first town in which they were used, however, was New Haven, Conn. Up to the present there are 10 installations working in different parts of the United States, and a very much larger number of towns are considering the installation of these lamps. Providence, R. I., is making plans for the installation of 1500 of these luminous arc lamps. It should be a great source of satisfaction to the people of Missoula that the downtown streets of their city are equipped with these lights, and it is certain to have an excellent advertising value to the town. Missoula is the only town where the installation of these lights has been made by the public service companies of the city. In every other place, the lamps having been installed at the cost of the abutting property owners or of the city at large. When, in addition to this fact, it is stated that the amount paid by the city for the light furnished to these lamps is no greater than it is in places where the public service companies have been put to no expense in connection with the installation, it would seem that the people of Missoula should feel that they have been very well served in this matter through the liberal policies of W. A. Clark, who owns the properties referred to.



W. A. Clark

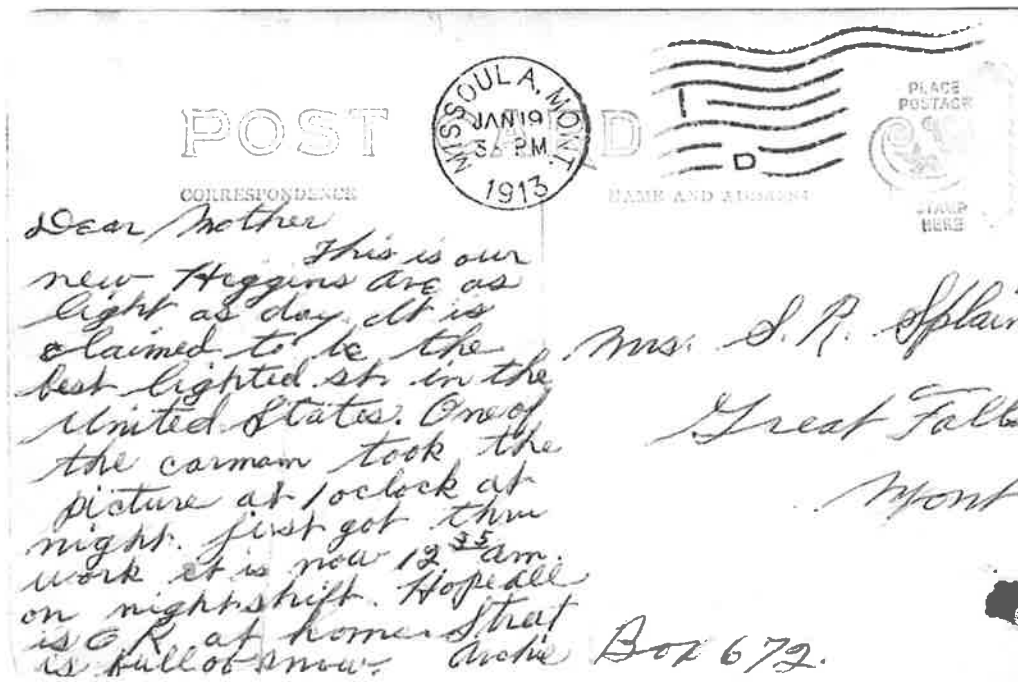
This installation and the way in which it has been handled at a minimum cost to the people of the city, may be taken as one of a long series of

improvements which Mr. Clark has made in Missoula, and which has given to the town public service facilities which are rarely equaled in towns many times the size of Missoula. These include the construction of a large water power plant at the confluence of the Missoula and Blackfoot rivers, the conserving, by the development of lakes in the upper Rattlesnake district, of Missoula's water supply, the construction of one of the most-up-to-date street railway systems in existence anywhere, and finally, the installation of the new lighting system, which up to the present, Missoula shares with only 10 other cities in the United States.

It is safe to say that no other municipal improvement which Missoula has ever undertaken will be of greater value to the city than the new street lighting system for the business section. It is serving in several different ways to advance the city's interests. First, is its utility, and this was evident from the moment Mayor Rhoades pressed the button that turned on the current and the lamps blazed forth in all their glory. For some years Missoula has considered her streets well lighted, but increased volume came with the turning of the switch which made the difference between the old and the new almost as much, as that between the former system and the old-fashioned, flickering oil lamps. Missoula's business center at night now sends out a great, soft, white magnetite glow that can be seen for miles. It not only illuminates the walks and the streets, but the diffusion is so perfect that even the highest buildings shine forth in bold relief against the dark background of the sky. So perfect is the light that splendid photographs have been taken of the streets at night, with only a few seconds exposure. The safety of life and limb is now as fully guaranteed to pedestrians at night in the district where there is naturally a congestion of traffic as it can be in the same district at high noon. There are no confusing shadows, no dark corners. The beauty of the window displays, for the excellence of which Missoula is noted, is greatly enhanced by the influence of the light from the new lamps. The illumination from without has made it possible for the merchants to reduce the number of lamps within and has been the means of effecting considerable saving to them in this manner.



A streetcar runs in winter and a description of the new streetlights in a 1913 postcard.



Our "new" Higgins Avenue at 1a.m. - 1913



"Torch Streetlights" and trolley at corner of Higgins and Front Street

And then the new system is the greatest advertisement Missoula has ever had. It gives strangers a correct first impression as against a misconception which for years has been only possible. Strangers reaching Missoula at night over either the Northern Pacific or the Puget Sound railways can not escape from a most enchanting view. North Higgins avenue, with its extension of the bridge across the Missoula river, now directly connects Missoula's two passenger depots. It is a distance of about 10 blocks between the two stations and it is impossible for incoming travelers to escape a walk or a ride along at least half of this distance to reach the down-town section. As the lighting system is carried out across the bridge as well as along the avenue, the view at night is startlingly realistic and by the time the stranger reaches his hotel he is sufficiently impressed with the sight to make such impression lasting.



Missoula's Downtown (ca. 1940)

The streetcars are gone, but the historic streetlights remain

From a publicity standpoint, too, the city has gained much on account of the installation of the system. Scores of magazines and engineering journals have sent urgent requests for pictures and written descriptions of the Garden city's new street lights and many illustrated articles have already been published. The keen interest of other cities in the street lighting problem is indicated by the letters, which come almost daily from all sections of the country asking not only the light company but the city officials to furnish figures concerning the efficiency and the general plan of installation of the new pole lamps. It is with much satisfaction and pride that these letters are answered because by these requests is Missoula's leadership demonstrated.

Missoula has gained more than illumination by the installation of the new lights. The proposition submitted by the company carried with it the provision that if an agreement for a three years' use of the lamps was entered into the street railway company would double track Higgins avenue and Cedar streets, thus facilitating service and eliminating congestion. This provision has already been carried out, Higgins avenue and Front Street have been paved with vitrified brick and Cedar Street with wood blocks. The lamps are carried on ornamental brackets attached to steel poles set in pairs along the streets 100 feet apart. At the intersections there is a double lighting effect that is brilliant, two posts having been set within a few feet of each other at the intersection of the curb lines, giving eight lamps in all for this small street space.

Missoula has just cause to be pleased with and proud of the new street lighting system. It is a municipal accomplishment that has placed her at the head of a list of the only 10 cities in the whole United States. It has brought acknowledgement of her leadership. Surely these, combined with all of the local

advantages the new lights extend, are reasons good and sufficient. Missoula's holiday season was never before as brilliant as it is this year. It's the light.^{xiv}





Modern versions of streetlights in Missoula's Downtown.



*Note: All photos in this report may be reproduced only for use in conjunction with the preparation of Missoula's Downtown Master Plan (2008). Permission for additional use should be requested from Stan Cohen – Pictorial Histories Inc. Missoula, Mt. 59801 (406)-549-8488

Endnotes:

- ⁱ Meyers, Rex. "Trolleys of the Treasure State." Montana The Magazine Of Western History, Vol. XXII, Number 2, Spring, 1972. 38.
- ⁱⁱ The Weekly Missoulian, Aug. 7, 14, Oct. 7, and Nov. 6, 1889. Also March 2, 1891 and April 15, 1892.
- ⁱⁱⁱ Meyers, "Trolleys," p 42.
- ^{iv} Ibid.
- ^v Griffing, Ben. "Street Cars Of Missoula." Montana Historian, Vol. VI, no. 1, March 1976. p. 24-25.
- ^{vi} Missoulian, May 12, 1910.
- ^{vii} Swett, Ira L. "Montana's Trolleys." Interurban Magazine, Vol. III, 1970. p. 73.
- ^{viii} The Daily Missoulian, March 30, 1958.
- ^{ix} Forstall, Al. "Missoula, MT." Traction & Models, Run No. 217, May, 1984. p. 14.
- ^x Ibid.
- ^{xi} Missoulian – Centennial Edition. 1960.
- ^{xii} The Daily Missoulian, January 22, 1932.
- ^{xiii} Missoulian, August 25, 1935.
- ^{xiv} Missoulian, December 12, 1912.

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November 11, 1891; March 2, 1891; April 15, 1892; February 22, 1893.