



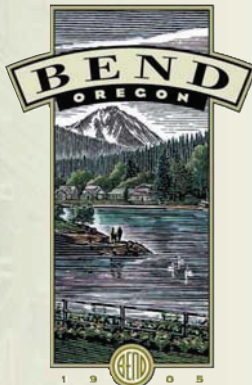
Reed Market *Corridor Study*

SUMMARY REPORT

Prepared for

City of Bend
Engineering Division
PO Box 431
Bend, OR 97709

June, 2006



Prepared by

Parametrix

In association with

Otak, Inc.
Heritage Research Associates
Kleinfelder Associates
TW Environmental
Universal Field Services

Reed Market Corridor Study Final Report Summary

Prepared for

City of Bend

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Bend, OR 97709

Prepared by

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June 2006

Project No. 274-2763-002

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EXECUTIVE SUMMARY

The Reed Market Road corridor from the Bend Parkway to SE 27th Street is one of only three designated “Major Arterial” Roadways included in the City of Bend Transportation System Plan. The City’s rapid growth and shifting transportation trends have resulted in significant traffic pressure on Reed Market Road. The roadway cross section varies along the corridor from two lanes of pavement with gravel shoulders to four lanes with bike lanes and sidewalks. Daily traffic volumes vary from 15,000 (east of 15th Street) to over 20,000 (west of 15th Street).

City Council authorized a corridor study to evaluate existing conditions and develop an implementation plan for Reed Market Road improvements. The overall objectives of the Reed Market Corridor study are to plan, schedule, design and construct roadway modernization improvements resulting in a corridor that moves traffic efficiently and safely, is attractive, meets community needs and expectations and is economically feasible to construct and maintain. A Request for Qualifications was published in January, 2005, and Parametrix, Inc. was selected as the consultant lead, with OTAK, Inc. as the local consultant partner.

The report following is the final work product of the corridor study representing thousands of hours of staff and consultant collaboration and the participation of hundreds of citizens in public meetings, interviews and correspondence. Chapter One of this report summarizes all the elements of the study process and the recommendations. All of the detailed project reports and evaluation data are appended to the report.

Throughout the project two basic corridor design concepts were studied: A signalized corridor and a multi-lane roundabout corridor. Both concepts included a recommendation to grade separate the Burlington Northern Santa Fe (BNSF) railroad crossing between Paiute Way and SE 9th Street. The project team developed several layers of recommendations including:

- Ultimate design concept for the corridor
- High priority project implementation plan for the next ten years
- Interim projects. (These projects address existing needs and can be implemented within the near term, but may not meet the traffic needs in the 2030 design year.)

The challenge has been to select high-impact projects that will effectively address transportation needs and can be funded with available resources. The ultimate design concept recommended is the multi-lane roundabout corridor. It is recommended because it provides the greatest benefit to operations for all modes of traffic, accommodates access management and increased capacity, and allows for some reduction in right-of-way requirements between intersections. The multi-lane roundabout corridor concept also addresses Emergency Services’ ability to use the Reed Market Corridor as a response route. A complete discussion of the evaluation of all alternatives considered is included in the report.

Recommended High Priority and Interim projects include the following:

- Multi-lane roundabout at Division that would incorporate the northbound parkway ramps (potential cost sharing with ODOT)
- Access control (centerline median) between Division and Third Street (This segment has the highest crash rate in the corridor, primarily due to left turns into and out of driveways.)
- Multi-lane roundabout at Third Street
- Temporary signal at American Lane, including railroad pre-empt (to be removed when grade separated rail crossing is constructed)

- Multi-lane roundabout at 15th Street including widening to the west to allow for additional storage during train delays
- Three lane section east of 15th to address existing sight distance concerns and accommodate left turn pockets
- Grade separation of the BNSF rail crossing, including an underpass for SE 9th Street beneath Reed Market and connection to the future local street grid.

These project recommendations are those that can be built in the near term with identified City funding resources and state/federal funding participation. They do not include all the elements of the “ultimate multi-lane roundabout corridor design.” To construct that ultimate design, including all the corridor project recommendations, would cost far more than the available funding resources. All project recommendations are consistent with the ultimate corridor design concept. Recommendations for partial-widening or interim signals are intended to be adapted or removed when the multi-lane roundabout corridor is fully developed.

Project recommendations also include a discussion of funding needs, financing strategies and the possibility of pursuing a federal funding authorization to assist with the significant cost (\$12 million) of constructing the grade separated rail crossing. The Final Report also includes recommendations for improvements to parallel and intersecting corridors; improvements that could provide alternate routes and potentially shift trips off the Reed Market Corridor and extend the functional life of recommended projects.

Estimated total cost for the projects included in the implementation plan is \$34 million: \$16 million in the first five years and \$18 million in the second five years, which includes the \$12 million for the grade separation of the rail crossing. The City’s current Capital Improvement Program for transportation projects does not include resources adequate to fund the total cost. State and federal participation through grants and spending authorizations may reduce the City of Bend budget requirement. The Financial Strategy Technical Report includes proposals for updates to SDC project listing and cost assumptions and other city-wide transportation funding strategies appropriate for Reed Market Road and other high-priority transportation needs throughout the City of Bend.

The City of Bend would like to acknowledge the highly professional work of the project team, the extensive public involvement participation and the interagency cooperation that have been essential to successfully completing this project.

1. SUMMARY OF RECOMMENDED IMPROVEMENT PLAN

The City of Bend has taken the first steps in a comprehensive assessment of improvement needs and opportunities along the Reed Market Road corridor. The corridor is one of the City's major east-west arterial roads and serves a critical function of connecting destinations west of the Deschutes River and along the U.S. 97 corridor with rapidly growing areas in the east and southeastern portions of the city. The City's primary goal in undertaking the Reed Market Road Corridor Study is to establish a phased program of improvement projects that have broad public support and that can be funded and implemented incrementally.

This chapter documents some of the key reasons for addressing transportation issues within the corridor, and presents a summary of the major recommendations. A phased implementation plan with cost estimates and a proposed funding strategy is also included. Later chapters in this report:

- Discuss the public involvement program that provides guidance to identifying problems, proposing solutions and determining priorities;
- Provide greater detail on the findings and conclusion about existing and potential future transportation problems within the corridor;
- Outline the alternatives that were evaluated to address these problems;
- Identify design criteria and project elements for use during the final design phases; and
- Highlight cost estimates, funding resources and a recommended phased implementation strategy.

It is important that the planned 20-year design and roadway configuration for Reed Market Road be adopted by Bend City Council in order to preserve adequate right-of-way, initiate System Development Charge (SDC) amendments, and solidify expectations of affected property owners, residents, and businesses within the corridor. Future development applications that are submitted to the City of Bend for approval should be reviewed by City staff for consistency with the Reed Market Road Corridor Plan. Appropriate building setbacks should be required along with right-of-way dedication for accommodating future construction.

1.1 HISTORY AND FUNCTION OF REED MARKET ROAD

Reed Market Road was originally established as a farm-to-market, rural road connecting areas to the south and east of Bend with both the city and the US 97 highway corridor. The road and its surrounding area was originally located in an unincorporated portion of Deschutes County and most properties along the road were platted prior to 1980. Right-of-way lines were originally determined based on a specified distance from the roadway centerline. Existing roadway rights-of-way vary considerably along the length of the road in the Reed Market Corridor study area and these are described in greater detail in the preliminary engineering issues technical memorandum. Roadway rights-of-way will need to be clarified prior to final design and construction of roadway improvement projects along the corridor.

When the corridor was annexed to the City of Bend, Reed Market Road was accepted by the City in its largely unimproved condition as a rural road. Improvements made since annexation are primarily focused on the western end of the corridor in the vicinity of Business 97 (3rd Street) and the Bend Parkway (US 97). East of this area, some improvements have been made in the vicinity of the Burlington Northern Railroad and 9th Street, and in the vicinity of 27th Street. The remainder of the road, from several hundred feet east of 3rd Street to west of 27th Street, is largely still configured as a rural road.

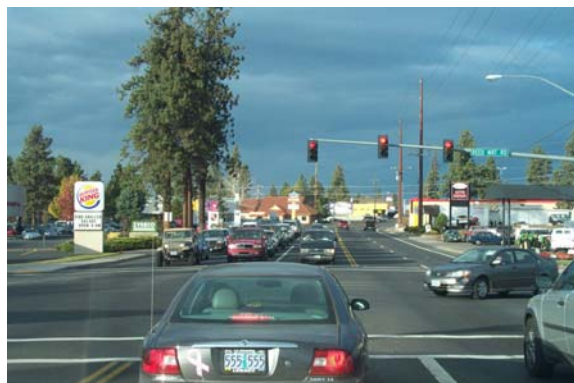
Reed Market Road is classified by the Bend Transportation System Plan (TSP) as a Major Arterial between Bond Street and 27th Street. Unlike US 20, Reed Market Road connects directly with the Bend

Parkway and, since October of 2003, also connects directly with a new southern crossing of the Deschutes River. Its role within the overall Bend transportation system is to provide both localized transportation within the south eastern portion of the urbanized area, as well as through service to move vehicular traffic from the vicinity of 27th Street to the US 97 corridor. The corridor is also used by persons traveling both to the west side of town (via the Southern Crossing Bridge) and to downtown Bend via the Old Mill District. The Draft Regional Transportation Plan identifies Reed Market Road as a truck route.

1.2 PURPOSE AND NEED FOR IMPROVEMENTS

Traffic volumes have increased substantially along the Reed Market Road corridor over the past five years and are continuing to grow rapidly as the south and eastern portions of the city develop. Several locations are currently experiencing significant traffic congestion with long delays including Reed Market Road at 3rd Street, American Lane, and 15th Street.

Significant delays are also experienced from time-to-time where the road crosses the Burlington Northern Santa Fe railroad tracks between American Lane and 9th Street. At this location, delays have been measured that are as long as 15 minutes, with an average of between 4 and 5 minutes approximately 8 times per day. The unpredictable nature of train crossings and resulting traffic queues compel emergency services to use other routes, delaying response times in this portion of the city.



Northbound 3rd Street at Reed Market Road

In addition to the growing congestion problems, the corridor also experiences critical safety problems (including turning movement crashes at intersections, rear end collisions at congestion points, and sight distance problems at several locations); lacks bicycle and pedestrian facilities in many locations and provides no accommodation for any future fixed route transit service; lacks good connectivity that provides alternative travel routes to reduce the need to use Reed Market Road, has limited right-of-way for roadway widening, and has no cohesive strategy for access management to preserve vehicle capacity and enhance safety.

The Reed Market Road Corridor Study was undertaken to develop a cohesive and comprehensive approach to addressing these existing problems, and to identify and address likely future problems as the area continues to grow. A wide range of improvement options were identified, evaluated based on corridor goals and objectives, and a series of specific project recommendations were developed to address these problems.

1.3 PROJECT GOALS

Through the public involvement process, a Vision Statement was developed for the corridor to define what the corridor's improvement strategy should accomplish over the long-term.

Vision Statement – *Reed Market Road is an attractive and safe facility that effectively moves people, goods and services while minimizing adverse impacts to neighborhoods and the environment*

Guiding principles were also developed to further refine the vision statement and to provide the basis for evaluating how successful each of the improvement alternatives would be in meeting the overall vision. These guiding principles address such diverse issues as: Transportation system performance and safety, public issues and concerns, business needs for visibility and access, protection and preservation of neighborhoods, freight movement, protection of the natural environment and general land use compatibility. The guiding principles describe an effective implementation strategy in the corridor that:

- Serves all forms of street travel including autos, trucks, pedestrians, bicyclists and future transit
- Maximizes safety for all users
- Provides less congested traffic conditions now and for the future
- Enhances emergency vehicle response times
- Improves local street connections to reduce need to use Reed Market for short trips
- Provides for property access without degrading safety or capacity
- Maximizes neighborhood compatibility
- Is cost-effective (provides good value for the money)
- Is constructible in phases (to better match project costs with available funding)
- Is aesthetic/attractive and appropriate to surroundings

1.4 SUMMARY OF RECOMMENDATIONS

Based on the evaluation of alternatives for addressing these needs as described in Chapter 4, a series of improvement projects have been recommended to meet both the short-term and long-term needs identified within the Reed Market Road corridor.

The ultimate recommendations represent an improvement concept intended to be implemented over the next 20+ years as development occurs and traffic volumes increase. Short-term or interim improvements are intended to be implemented within the next five to ten years. The ultimate corridor concept includes the following elements:

- Major intersections in the western portion of the corridor to be constructed as multi-lane roundabouts including:
 - Division Street/Bend Parkway northbound off-ramp combined into one roundabout
 - 3rd Street
 - 15th Street
- Intersections east of 15th Street to be stop sign-controlled on the side streets with left turn lanes on Reed Market Road.
- Overcrossing of Burlington Northern Santa Fe (BNSF) railroad tracks between Paiute Way and east of 9th Street with new connections to American Lane and 9th Street.
- Pedestrian and bicycle enhancements including sidewalks, bicycle lanes and multi-use trails.



Example of Multi-lane Roundabout

- Future north/south street connections at 4th Street and Centennial Boulevard/Brosterhouse Road Extension as development occurs. Multi-lane roundabouts are recommended at Reed Market Road intersections.
- Widen to 4 lanes with median from east of 3rd Street to 27th Street when required to meet long-term needs, interim improvement to 2 lanes with median east of 15th until demand warrants further improvement.
- Other smaller improvement recommendations as shown in the capital improvements program summary tables (see Tables 4 and 5).
- Consideration of transit in the design criteria developed for the project (see Appendix M).

These recommendations are illustrated for each segment of the Reed Market Road corridor in Figures 1 through 10 on the following pages. It should be noted that these recommendations do not preclude the City of Bend from implementing improvements in the corridor that are not specifically identified in the concept should traffic and/or safety conditions warrant. An example, might be the need for future widening at the intersection of Reed Market Road with 27th Street as development to the east occurs.

1.5 IMPLEMENTATION STRATEGY

Projects of Reed Market Road's magnitude are typically constructed using a combination of funding and financing over several years or even decades, and they often require a combination of local, state, and federal funding participation. A deliberate phasing strategy is required to focus available local funding on portions of the corridor that benefit travelers and commerce the most. The following pages identify specific projects and priorities that can be built over the next 20+ years to meet both the immediate traffic congestion and safety needs, and to achieve long-term corridor improvement goals.

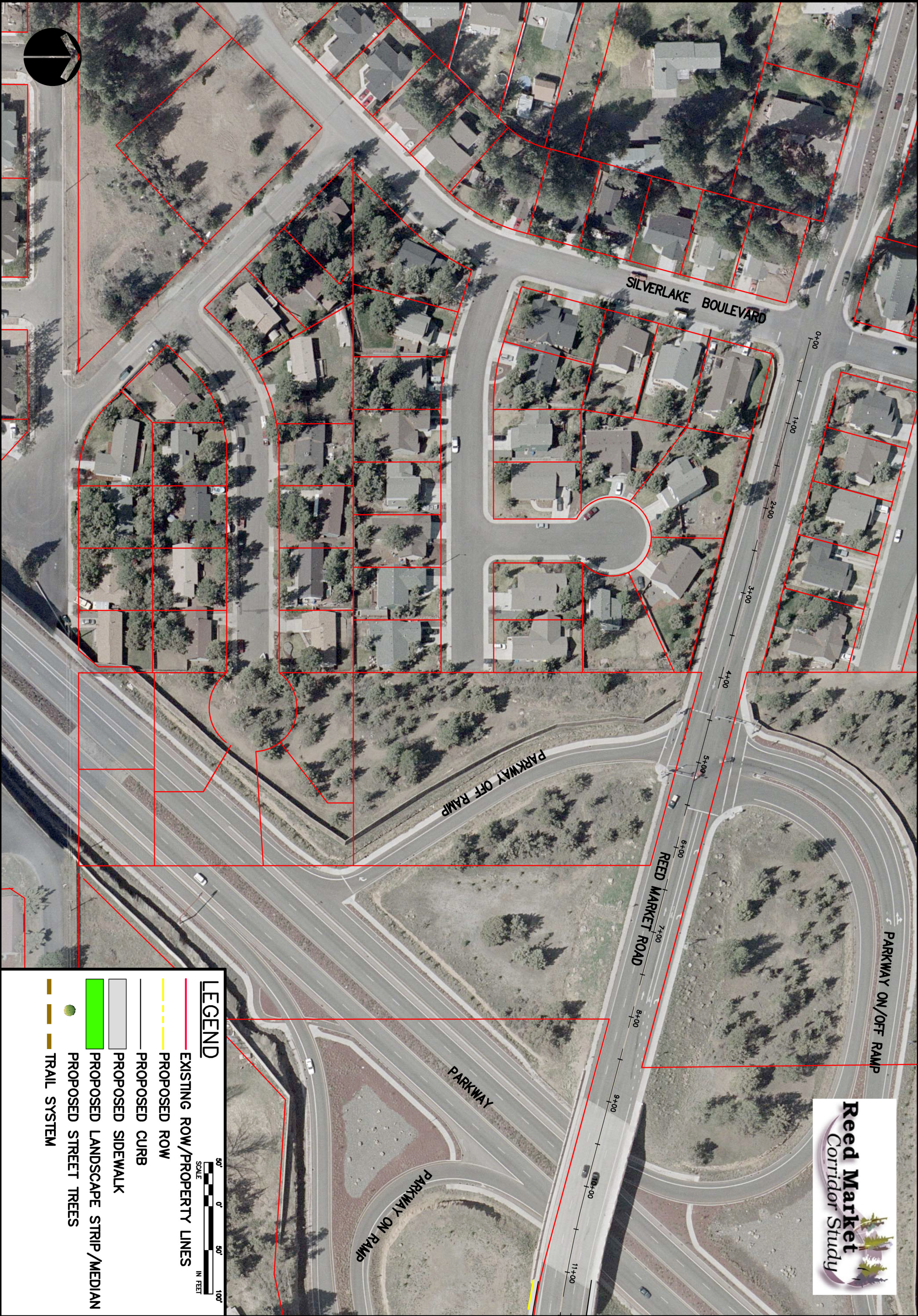
Priorities were developed based on several factors, including:

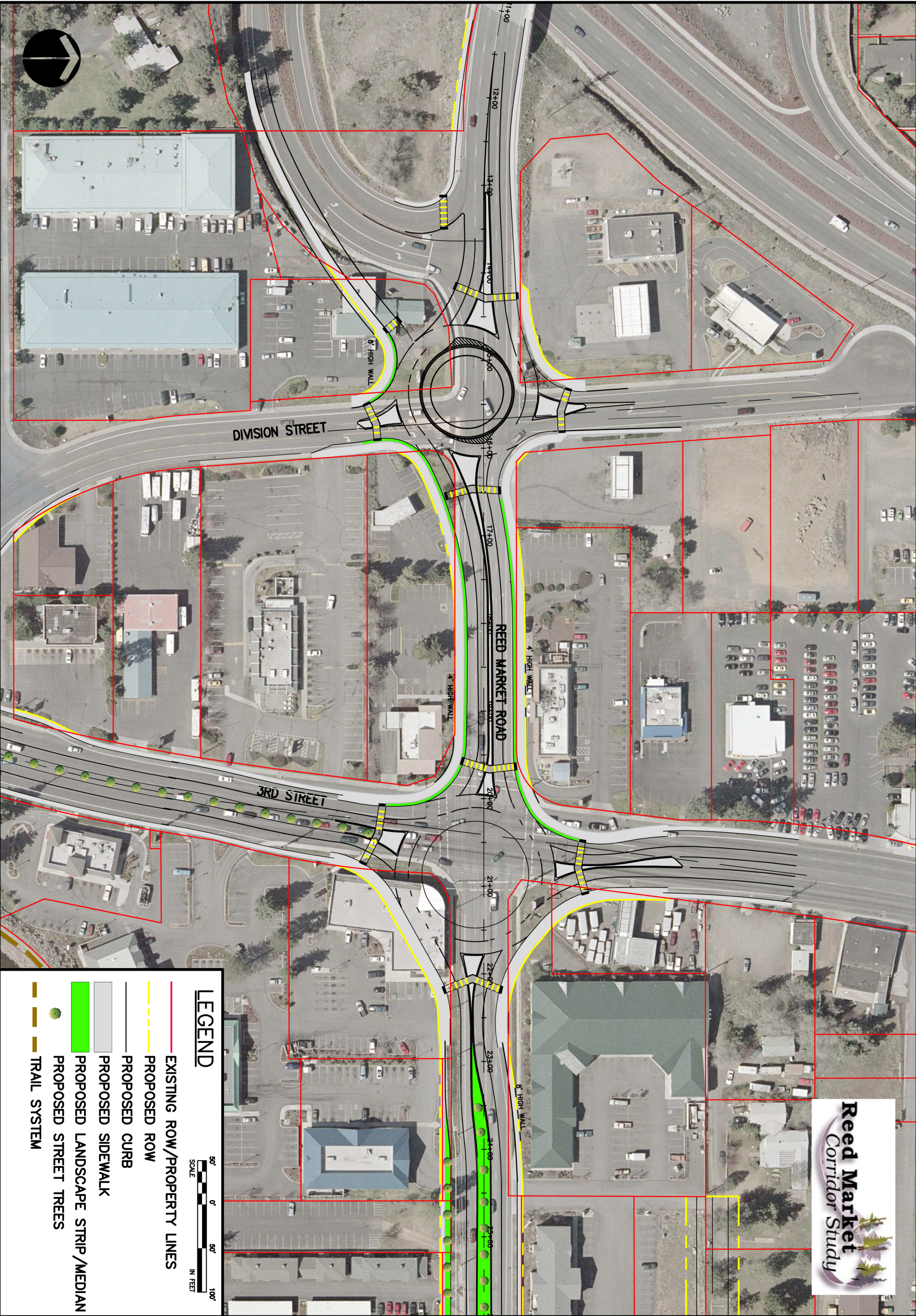
- Need for addressing existing congestion, safety, and connectivity issues.
- Public input on needs and priorities which emphasized the importance of addressing existing problems in the vicinity of the Parkway, 3rd Street, American Lane, the railroad crossing and 15th Street.
- Costs of each high priority project in relation to available funding and the potential for securing additional funding through grants and other sources.
- Time required to secure funding, right-of-way acquisition, permitting and to address design or other implementation complexities.

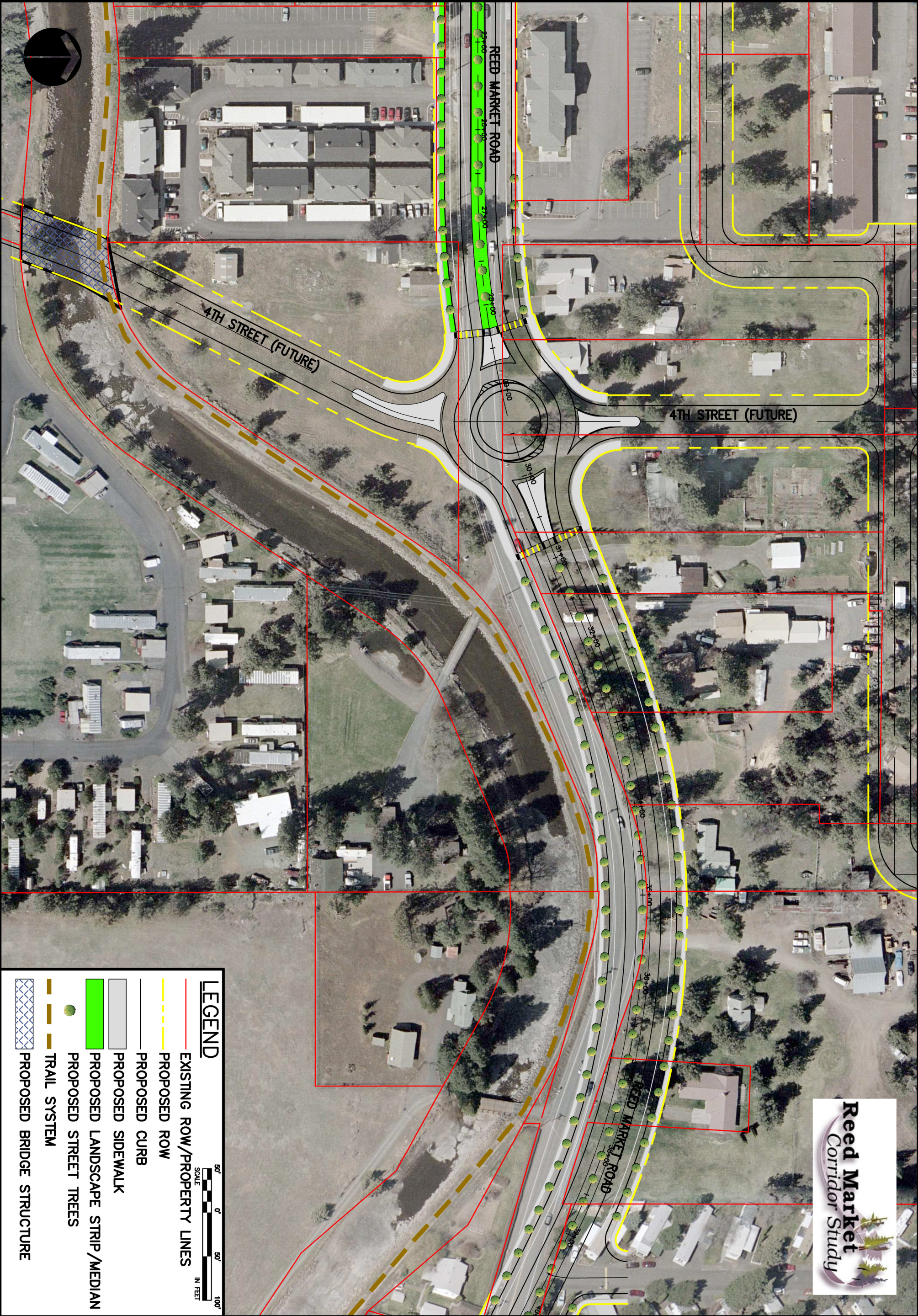
Recommended Short-Term, Medium-Term and Long-Term corridor priorities are presented in the following pages, in Tables 1 through 5, and in Figures 11 through 13.

1.5.1 Recommended Near-term Priorities

Table 1 identifies the recommended near-term improvements for Reed Market Road. It is anticipated that the near-term improvements can be implemented over the 2006-2010 time period to address existing congestion and safety deficiencies along Reed Market Road. Given limited existing budgetary constraints in the City of Bend, the improvements listed in Table 1 are intended to be constructed within available funding using SDC revenue for streets assessments.



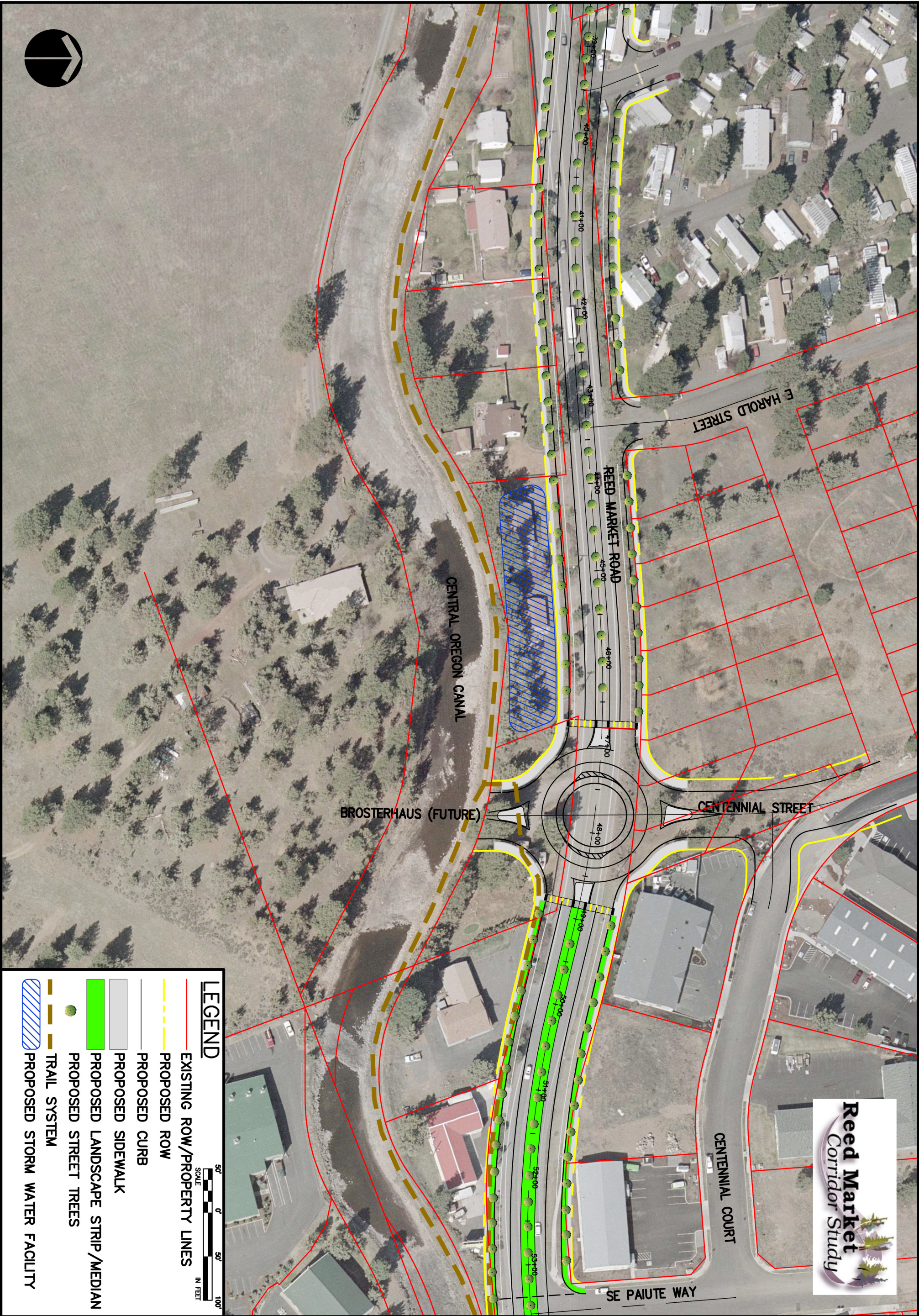




REED MARKET CORRIDOR STUDY RECOMMENDED CORRIDOR CONCEPT STA 25+00 TO STA 39+00



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REED MARKET CORRIDOR STUDY
RECOMMENDED CORRIDOR CONCEPT
STA 39+00 TO STA 53+00





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LEGEND


 EXISTING ROW/PROPERTY LINES


 PROPOSED ROW


 PROPOSED CURB


 PROPOSED SIDEWALK

 PROPOSED LANDSCAPE STRIP/MEDIAN


 PROPOSED STREET TREES

 TRAIL SYSTEM

 PROPOSED BRIDGE STRUCTURE

 PROPOSED STORM WATER FACILITY

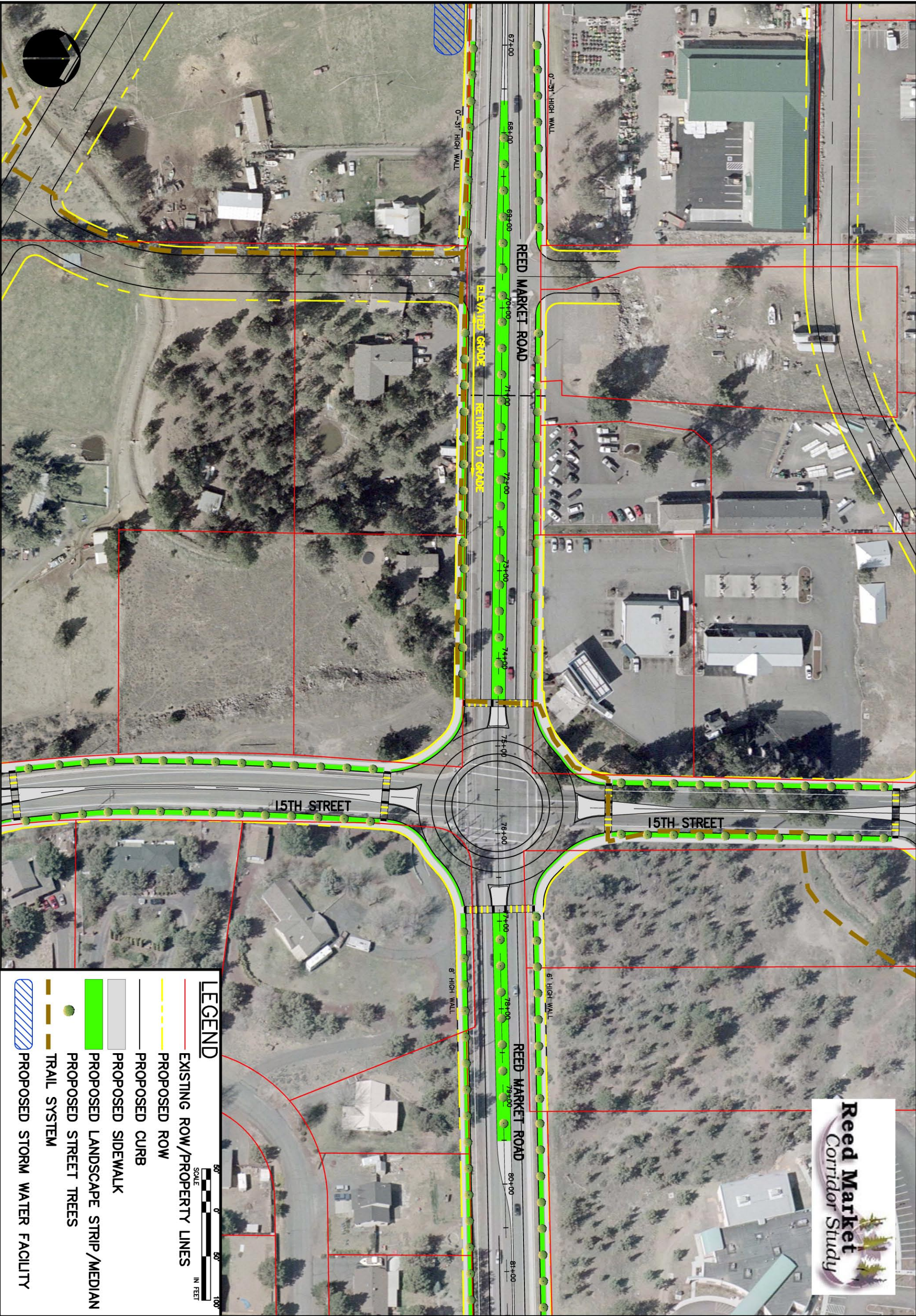
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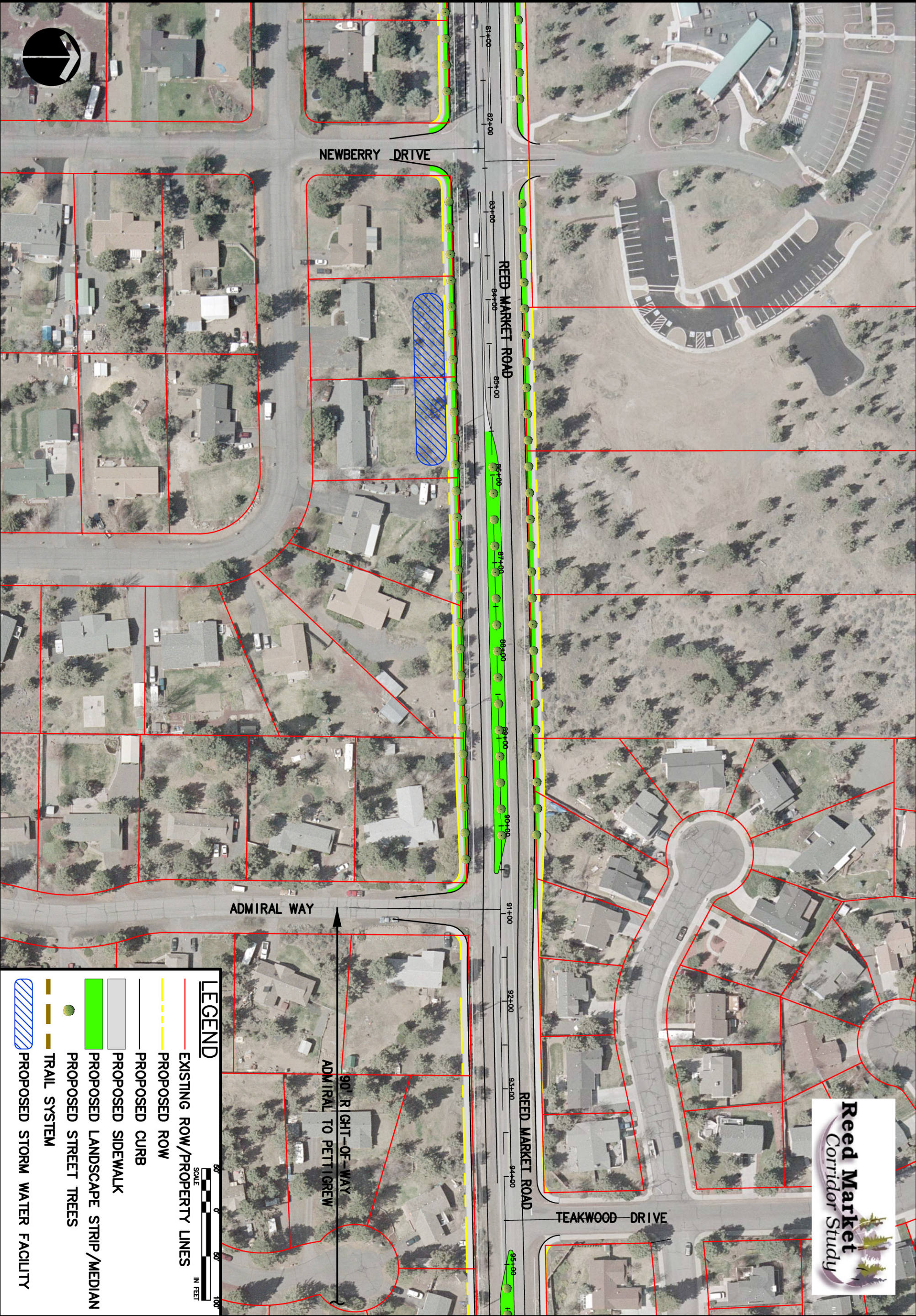


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Reed Market
Corridor Study

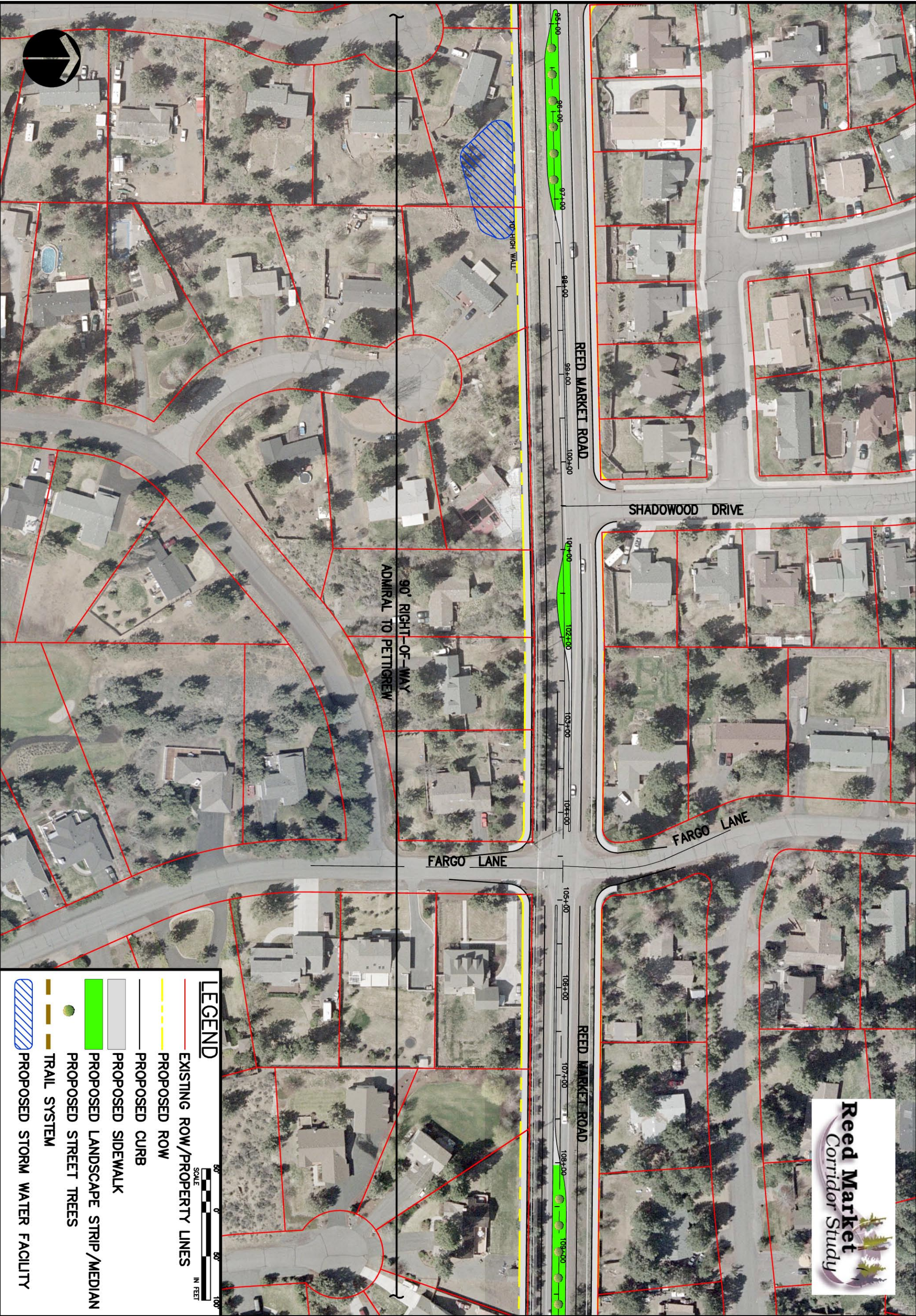


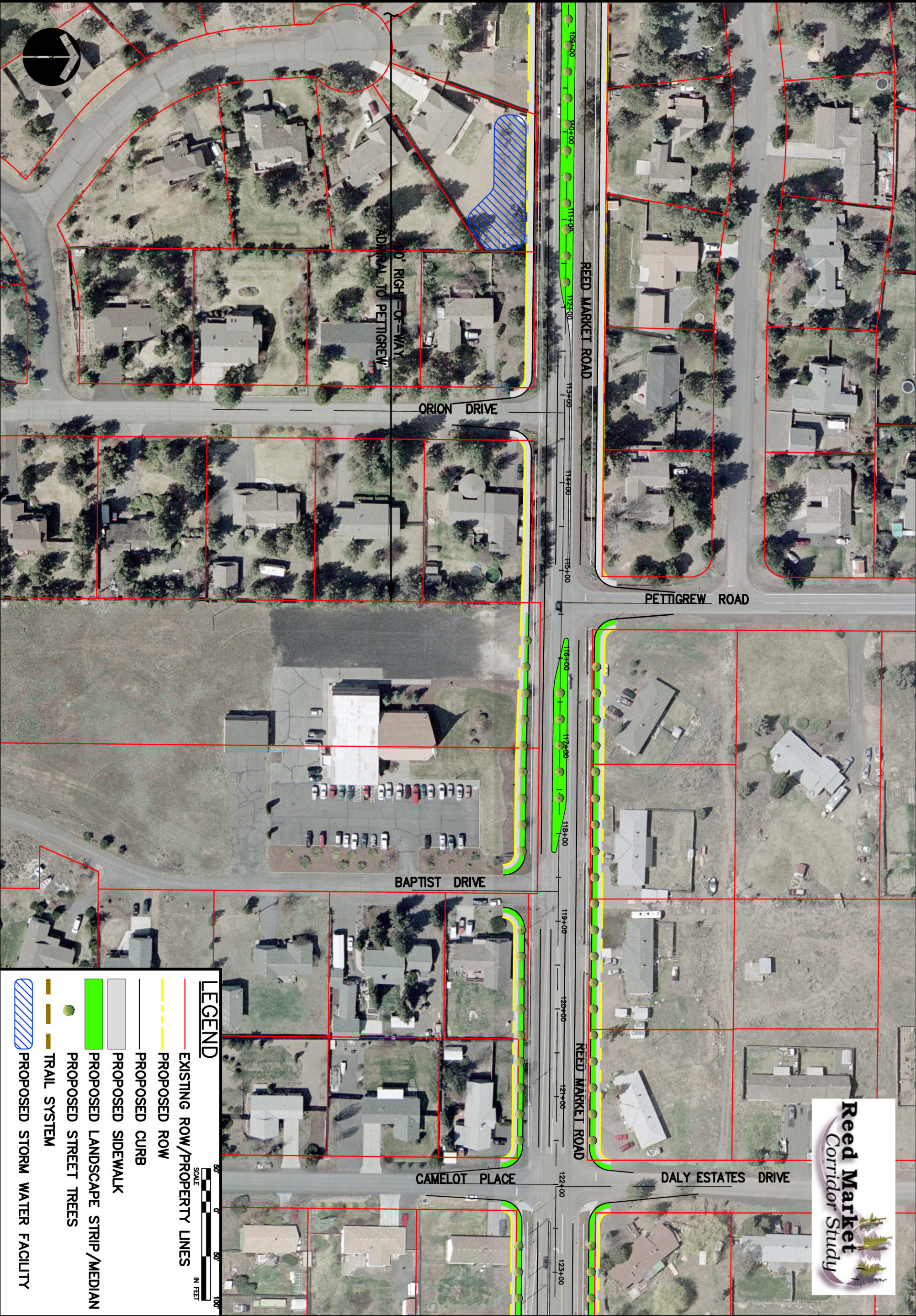


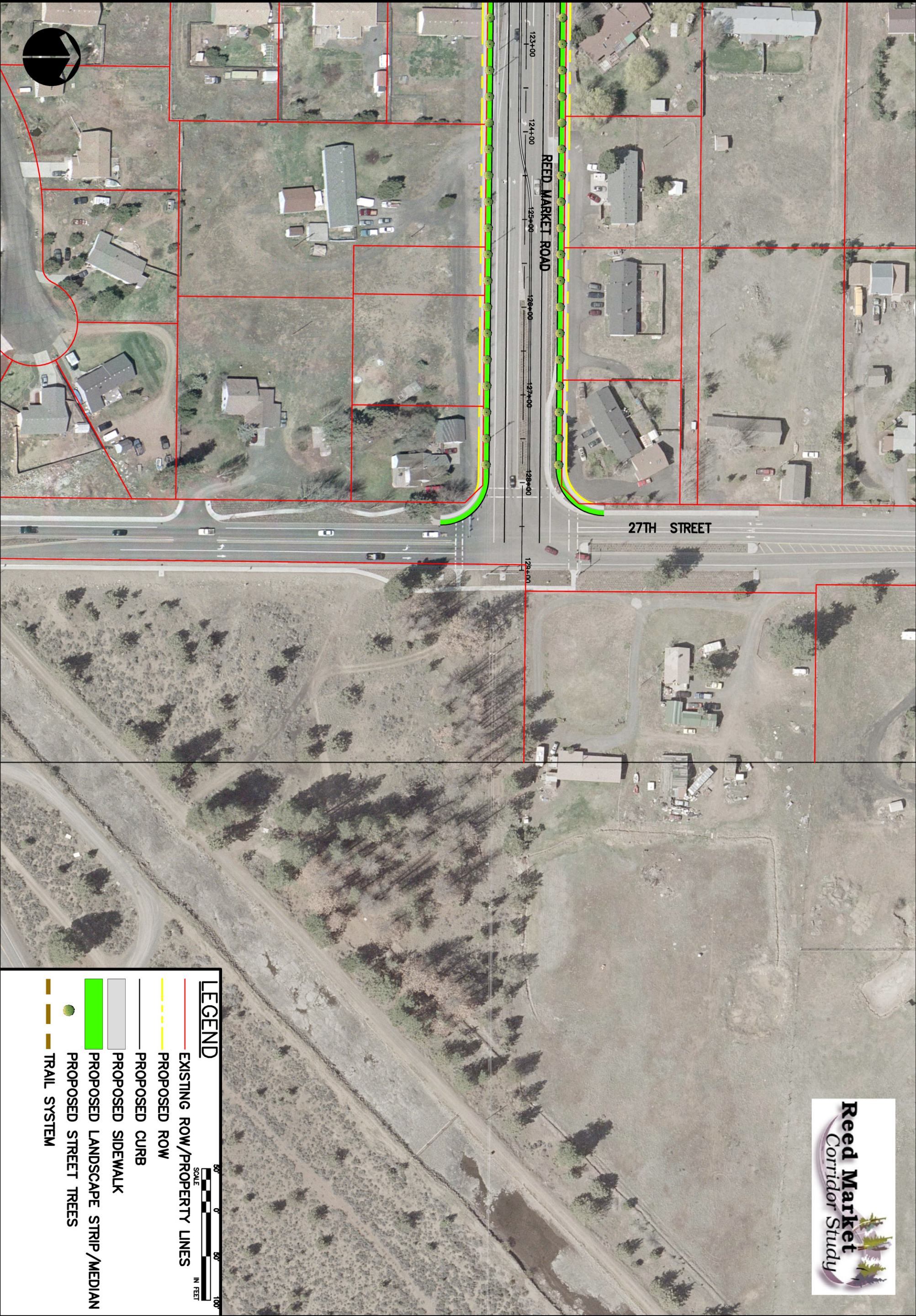
REED MARKET CORRIDOR STUDY
RECOMMENDED CORRIDOR CONCEPT
STA 81+00 TO STA 95+00



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LEGEND

- EXISTING ROW/PROPERTY LINES
- PROPOSED ROW
- PROPOSED CURB
- PROPOSED SIDEWALK
- PROPOSED LANDSCAPE STRIP/MEDIAN
- PROPOSED STREET TREES
- TRAIL SYSTEM

SCALE

0 50 100

IN FEET



REED MARKET CORRIDOR STUDY
RECOMMENDED CORRIDOR CONCEPT
STA 123+00 TO STA 129+00



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It is also anticipated that developer exactions could be required to construct interim improvements to Brosterhous Road at 3rd Street. Long-term recommendations for this intersection include a new multi-lane roundabout, which will likely require funding participation by developers. One financing tool could be the creations of a Reimbursement District.

ODOT also has a near-term role in funding improvements near the Bend Parkway, with a new roundabout planned for the north-bound parkway ramp at Division. The City will need to work closely with ODOT Region 4 and the Metropolitan Planning Organization (MPO) to see to it that these near term projects are fully evaluated and considered in future State Transportation Improvement Program (STIP) updates. It is recommended that the City proceed in partnership with ODOT to concurrently construct the recommended roundabouts for Division Street and 3rd Street.

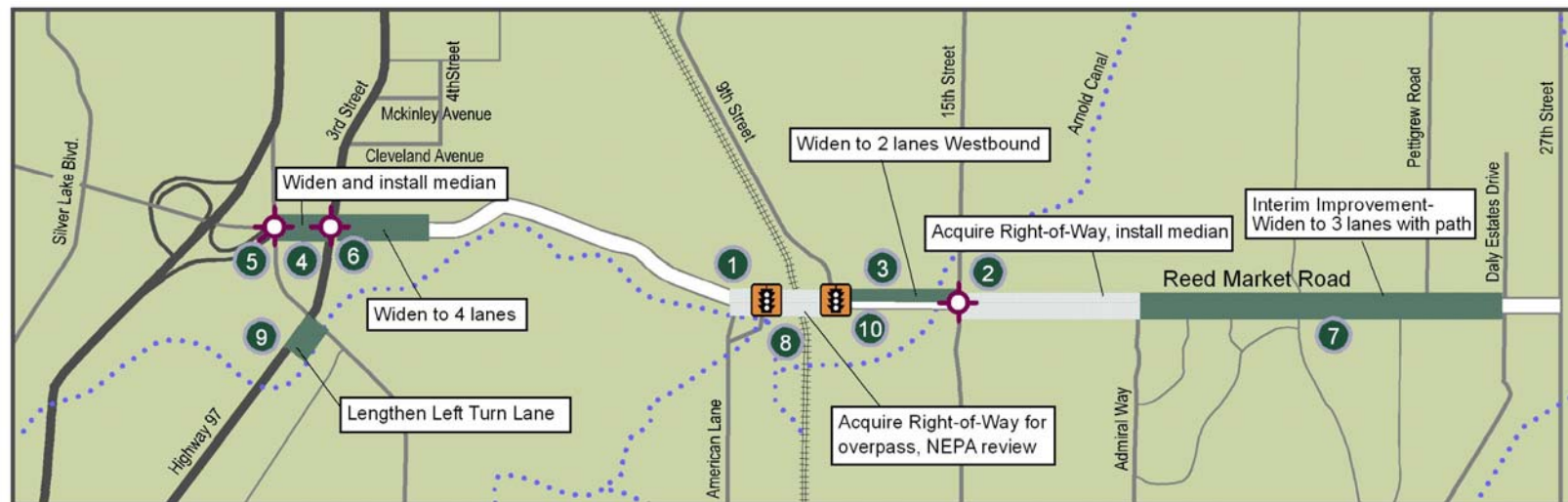
Recommended near-term improvements are illustrated in Figure 11 and detailed in Table 1. They include:

- RM-1: Installing a temporary traffic signal and railroad crossing preemption at American Lane.
- RM-2: Building a multi-lane round-about at 15th Street.
- RM-3: Widening Reed Market to three through lanes between 9th and 15th Streets.
- RM-4: Constructing a median barrier between Division and 3rd Street



Eastbound Reed Market Road at 15th Street

- RM-5 and RM-6: Constructing roundabouts at Division and 3rd Street along Reed Market Road including widening of Reed Market Road on the east side of 3rd Street to maximize the effectiveness of the roundabout.
- RM-7: Improving Reed Market Road between Newberry Drive and Daly Estates Drive to provide one through lane in each direction with left turn channelization at intersections and stop control on side streets (interim). An asphalt bicycle and pedestrian pathway would also be provided on the north side of Reed Market Road.
- RM-8: Initiating the permitting, design, and right-of-way acquisition for the railroad crossing. ODOT, federal and Burlington Northern Santa Fe (BNSF) Railroad coordination will be required to construct the new railroad overpass. At this time, we have assumed the City will pursue ODOT and Federal Railroad Authority grant money to pay for the majority of the railroad overpass. In light of the recent congressional approval of the federal transportation act known as SAFETEA-LU (which is a six-year transportation funding authorization), it is not expected that federal funding earmark opportunities to open up for several years.
- RM-9: Restriping to lengthen northbound left turn lane to accommodate additional traffic heading for Bend Parkway after completion of the Reed Market Road/Division Street roundabout (RM-5).



Map Features

- Canals
- Major Arterials
- Railroad
- Project Number

- Multi-Lane Roundabout
- Widen Road
- Right-of-Way
- Temporary Traffic Signal

Figure 11: 2006-2010 High Priority Improvements

Table 1
Reed Market Road Corridor Study, Capital Improvement Program (2006-2011)

Reed Market Road Corridor Study Capital Improvement Program (2006-2011)												
No.	Name/Location	Description	Project Phase	Cost (\$000)	Funding Source		Budget Year					Summary of Need
					City	Other	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	
TOP PRIORITY – Projects that Address Existing Traffic Operations and/or Safety Problems												
RM-1	American Lane at Reed Market	Install temporary signal and RR pre-emption	PE/Con	\$120	\$120		\$120					Existing LOS F for side street
RM-2	15th Street at Reed Market	Build multi-lane roundabout, acquire ROW at RM and 15th as needed for full improvement to Admiral, full improvement to Newberry	PE ROW Con	\$155 \$535 \$1,575	\$155 \$535 \$1,575		\$155 \$535	\$1,575				Existing LOS E with 2005 volumes, may be F with 15th Street connection to Highway 20
RM-3	Reed Market between east of 9th and 15th	Interim improvement – widen to 3 thru lanes (2 WB and 1 EB) – with RM-2	PE ROW Con	\$55 \$0 \$665	\$55 \$0 \$665		\$55		\$665			Accommodates traffic delayed by RR to minimize impact on 15th
RM-4	Reed Market between Division and 3rd	Interim improvement – install temporary median barrier between Division and 3rd	PE/Con	\$20	\$20		\$20					Addresses significant existing safety problem
RM-5	Division Street at Reed Market	Build multi-lane round-about including connection with NB off-ramp from Parkway – with RM-6	PE ROW Con	\$210 \$750 \$2,600		\$210 \$750 \$2,600	\$210	\$750	\$2,600			Existing LOS F for side street an NB off-ramp, possible ODOT lead with city match
RM-6	3rd Street at Reed Market and between 3rd and 4th Street	Build multi-lane roundabout at intersection and widen street to 4 thru lanes with sidewalks and bike lanes, install median – with RM-5	PE ROW Con	\$225 \$1,125 \$3,085	\$225 \$1,125 \$3,085		\$225	\$1,125	\$3,085			Existing LOS F, side street/property access & egress congestion/ safety issues
RM-7	Reed Market between Newberry and Daly Estates	Partial improvement (Footnote 1) - widen to 2 thru lanes with left turns/landscaped median, 5' shoulders, and asphalt path	PE Con	\$210 \$2,585	\$210 \$2,585			\$210		\$2,585		Provides separate area for turns, improves sight distance at Fargo, provides space for peds. and bikes
RM-8	Railroad Crossing	Acquire ROW for grade-separation of BNSF include NEPA and PE	PE ROW	\$1,055 \$790	\$1,055 \$790		\$528	\$527	\$790			Significant delays due to train activity, start design and funding positioning now
TOTALS				\$15,790	\$12,230	\$3,560	\$1,878	\$4,852	\$6,475	\$2,585	\$0	
SECOND PRIORITY – Projects that Address Short-Term Needs (1-5 Years)												
RM-9	Brosterhous Road at 3rd	Restripe to extend NB left lane vehicle storage to approx. 300 feet – with RM-5 and RM-6 (Footnote 2)	PE Con	\$2 \$23		\$2 \$23		\$2 \$23				Will likely be needed to support RABs on RM at Division and 3rd

Table 1 Continued
Reed Market Road Corridor Study, Capital Improvement Program (2006-2011)

Road Market Road Corridor Study, Capital Improvement Program (2006-2011)												
No.	Name/Location	Description	Project Phase	Cost (\$000)	Funding Source		Budget Year					Summary of Need
					City	Other	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	
SECOND PRIORITY Continued – Projects that Address Short-Term Needs (1-5 Years)												
RM-10	9th Street at RM	Install temporary signal with RR pre-emption and improve turning radii for right turns in and out (Footnote 3)	PE/Con	\$220	\$220						\$220	Existing LOS F for side street, observe need based on gaps created from American Lane
TOTALS				\$245	\$220	\$25	\$0	\$25	\$0	\$0	\$220	
0 TO 5 YEAR IMPROVEMENT TOTALS				\$16,035	\$12,450	\$3,585	\$1,878	\$4,877	\$6,475	\$2,585	\$220	

Note: All costs are in 2006 dollars. See Chapter 6 for discussion of cost escalation to year of construction. "Other" funding sources in this table refers to ODOT. It is important to note that no funding agreement(s) with ODOT are currently in place.

(Footnote 1) The 2 thru lanes with left turn lanes/landscaped median are full design improvements that can be expanded to 4 travel lanes with curbs and sidewalks in the future when the need dictates.

(Footnote 2) Anticipated to be developer-funded.

(Footnote 3) Project need will be reassessed after installation of temporary traffic signal at American Lane to determine if intersection would continue to benefit from signal installation.

- RM-10: Installing a temporary traffic signal with railroad pre-emption and improved turning radii at 9th Street is considered to be a lower priority than the above combined projects, but is still recommended in the 2010-2011 timeframe. The temporary signal at American Lane may by itself create adequate traffic gaps to improve operations at 9th Street, making this signal unnecessary.

The recommended improvements at Brosterhous Road at 3rd Street (RM-9) could be constructed as development occurs in the area with development dedications required to pay for restriping and expansion of left-turn lane vehicle storage.

1.5.2 Recommended Mid-Term Priorities

The City of Bend will likely need additional sources of funding to implement any improvements beyond those included in the near-term program. Table 2 identifies the next priority of transportation improvements in the Reed Market Road Corridor. Ideally, these improvements would be implemented over the 2011-2016 timeframe once new sources of funding are identified.

The recommended improvements are illustrated in Figure 12 and detailed in Table 2. They include:

- RM-11: Realignment and improvements to the American Lane intersection in conjunction with the grade-separation over the BNSF tracks including a new bridge over the Central Oregon Irrigation District canal.
- RM-12: Construction of the new railroad overpass, which will be dependent upon ODOT and MPO priority listing and available state and federal grant funding. At this time, it is assumed that the project could be funded with a 20 percent local and 80 percent non-local funding allocation.
- RM-13: Construction of a 9th Street connection to allow improved access to private development concurrent with completion of the new railroad overpass. Future development on the south side of Reed Market Road will address the extension of 9th Street to reconnect with Reed Market Road.

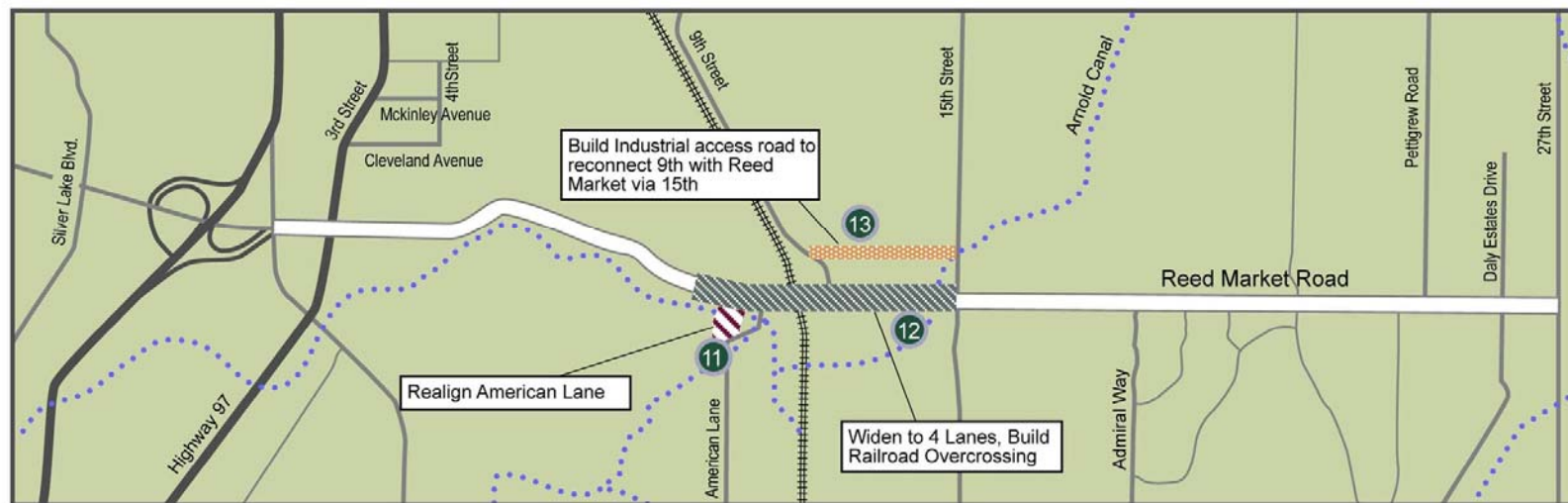


Eastbound Reed Market Road at BNSF railroad crossing

1.5.3 Recommended Long-term Priorities

The recommended long-term transportation improvements for Reed Market Road are illustrated in Figure 13 and detailed in Table 3. While these improvements certainly exceed existing funding resources, they have been identified to address anticipated vehicle and pedestrian/bicycle traffic in the corridor. The long-term transportation improvements for Reed Market Road are identified for completion during the 2016-2026 timeframe. They include:

- RM-14: Widening of Reed Market Road between new Brosterhous Road/Centennial Boulevard Extension and Paiute Way, and constructing a multilane roundabout at Brosterhous Road and Reed Market.
- RM-15: Widening Reed Market Road to two through lanes in each direction along with bike lanes, sidewalks and median between Pettigrew Road and 27th Street.



Map Features

- Canals
- Major Arterials
- +++++ Railroad
- ① Project Number

- Green hatched box: Widen Road/ Build Overcrossing
- Orange hatched box: New Road
- Red hatched box: Realign Road

Figure 12: 2011-2016 Improvements

Table 2
Reed Market Road Corridor Study, Capital Improvement Program (2012-2016)

Road Market Road Corridor Study, Capital Improvement Program (2012-2016)												
No.	Name/Location	Description	Project Phase	Cost (\$000)	Funding Source		Budget Year					Summary of Need
					City	Other	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	
THIRD PRIORITY – Projects that Address Mid-Term Needs (6-10 Years)												
RM-11	American Lane (Footnote 1)	Realign for new intersection on RM including bridge over canal, median at American – with RM-12	PE	\$135	\$27	\$108	\$135 \$70	\$1,665				Appropriate to construct at same time as RR crossing to match finished grade
			ROW	\$70	\$14	\$56						
			Con	\$1,665	\$333	\$1,332						
RM-12	Railroad Crossing	Construct grade-separation over BNSF railroad and over future 9th extension	Con	\$12,865	\$2,573	\$10,292		\$12,865				Federal grant application and award
RM-13	9th Street Connection	Construct new road with roundabout at 15th, could be extended to Senior Center on east – with RM-12	PE	\$130	\$26	\$104	\$330 \$3,265	\$3,970				Appropriate to construct at same time as RR crossing
			ROW	\$1,295	\$259	\$1,036						
			Con	\$1,575	\$315	\$1,260						
6-10 YEAR IMPROVEMENT TOTALS				\$17,735	\$3,550	\$17,840	\$3,800	\$18,500	\$0	\$0	\$0	

Note 1: All costs are in 2006 dollars. See Chapter 6 for discussion of cost escalation to year of construction. "Other" funding sources in this table refers to developers, ODOT, Federal grants and/or railroad contributions. It is important to note that no funding agreement(s) with any of the referenced sources are currently in place.

Note 2: RM-11, RM-12 and RM-13 constitute a package of projects associated with the railroad grade-separation. Cost sharing assumes a 20 percent city share and 80 percent federal, railroad and/or ODOT share.

(Footnote 1) The American Lane realignment and connection to Reed Market Road may not happen if Brosterhous Road is extended to connect to Reed Market Road with a roundabout. American Lane would have east/west connections to Brosterhous south of Reed Market Road and traffic could reach the latter street via this route.

- RM-16: Widening Reed Market Road and adding bike lanes, sidewalks and median between 4th Street and the new Brosterhous Road Extension.
- RM-17: Extending 4th Street south to Reed Market Road and constructing a multi-lane roundabout at the intersection.
- RM-18: As needed to accommodate future traffic volumes, widening Reed Market Road to provide two through lanes in each direction with left turns at intersections, along with bike lanes, sidewalks and median between 15th Street and Pettigrew Road. Consideration could be given to installing roundabouts at key intersections in this roadway segment depending on future traffic volumes.



Eastbound Reed Market Road east of 3rd Street

Additional long-term projects have also been identified for the Corridor to enhance overall multimodal transportation connectivity, to reduce the demand for travel on Reed Market Road, and to improve emergency response times. These “other long-term projects” are included in Table 4 and should be identified as “planned local street improvements” in the City’s Transportation System Plan. Conversely, the City’s Transportation Policy 6 ordinance could be amended to require developers to construct these projects as a condition of approval for new development that impacts these locations.

The additional long-term improvement recommendations within the Corridor are presented in Table 4 and include:

- RM-19: Connecting Silver Lake Boulevard with Brookwood Boulevard.
- RM-20: Connecting Chamberlain Road with Reed Market Road.
- RM-21: Improving turning radii for trucks at the Centennial Boulevard and Wilson Avenue intersection.
- RM-22: Improving turning radii for trucks at the 9th Street and Wilson Avenue intersection.
- RM-23: Connecting Bronzewood Avenue to 15th Street.
- RM-24: Constructing a multi-lane roundabout at 3rd Street and Brosterhous Road.
- RM-25: Connecting 9th Street to the south under the future railroad overcrossing.
- RM-26: Consider connecting 9th Street to 15th Street south of Reed Market Road with a roundabout intersection as future develop occurs.
- RM-27: Extend Wilson Avenue from 15th Street to Thomas Drive as development occurs or the airport closes.



Map Features

- Canals
- Major Arterials
- +++++ Railroad
- Project Number

- Roundabout
- ▨ Widen Road
- ▨ New Road

Figure 13: 2016-2026 Improvements

Table 3
Reed Market Road Corridor Study, Capital Improvement Program (2016-2026)

Reed Market Road Corridor Study, Capital Improvement Program (2016-2026)								
No.	Name/Location	Description	Project Phase	Cost (\$000)	Funding Source		Budget Year	Summary of Need
					City	Other	2016-2026	
FOURTH PRIORITY – Projects that Address Long-Term Needs (11 to 20+ Years)								
RM-14	Reed Market between Brosterhous and Paiute, Brosterhous Road at RM	Widen to 4 thru lanes with sidewalks and bike lanes, install median. Build multi-lane roundabout, extend and connect with Centennial Blvd on the north.	PE	\$245	\$245		\$245	Serves developing area, could provide new north/south collector road
			ROW	\$1,180	\$1,180	\$1,180		
			Con	\$3,785	\$3,785	\$3,785		
RM-15	Reed Market between Pettigrew and 27th	Widen to 4 thru lanes with sidewalks and bike lanes, install median	PE	\$135	\$245		\$245	May be needed to support pending commercial development
			ROW	\$620	\$1,180	\$1,180		
			Con	\$1,650	\$3,785	\$3,785		
RM-16	Reed Market between 4th and Brosterous	Widen to 4 thru lanes with sidewalks and bike lanes, install median	PE	\$350	\$350		\$350	Accommodate high demand for thru traffic and provide for redevelopment
			ROW	\$2,380	\$2,380	\$2,380		
			Con	\$5,325	\$5,325	\$5,325		
RM-17	4th Street at Reed Market	Extend 4th Street south to meet Reed Market and build multi-lane roundabout	PE	\$100	\$100		\$100	Serves developing area and would improve access to 3rd Street commercial
			ROW	\$1,485	\$1,485	\$1,485		
			Con	\$1,570	\$1,570	\$1,570		
RM-18	Reed Market between 15th and Pettigrew	Widen to 4 thru lanes with sidewalks and bike lanes, complete multi-lane roundabouts	PE	\$465		\$465	\$465	Timing dependent on development east of or traveling thru corridor
			ROW	\$2,800	\$2,800	\$2,800		
			Con	\$5,100	\$5,100	\$5,100		
11 to 20 YEAR IMPROVEMENT TOTALS				\$27,190	\$18,825	\$8,365	\$27,190	

Note: All costs are in 2006 dollars. See Chapter 6 for discussion of cost escalation to year of construction. "Other" funding sources in this table refers to ODOT. It is important to note that no funding agreement(s) with ODOT are currently in place.

Table 4

Other Projects that Could Benefit the Reed Market Road Corridor

Other Projects that Could Benefit the Reed Market Road Corridor								
No.	Name/Location	Description	Project Phase	Cost (\$000)	Funding Source		Budget Year	Summary of Need
					City	Other	2016-2026	
Other Projects that Could Benefit the Reed Market Road Corridor								
RM-19	Silver Lake Boulevard	Build connection to Brookwood Boulevard	PE/Con	\$100	\$100		\$100	Provides alternative for existing poor access onto Reed Market Road
RM-20	Chamberlain Road	Connect to Reed Market Road	PE/Con	\$50	\$50		\$50	Provides alternative Reed Market Road access
RM-21	Centennial Boulevard at Wilson Avenue	Improve turning radii	PE/ROW/Con	\$100	\$100		\$100	Improves truck accessibility in industrial area
RM-22	9th Street at Wilson Aveue	Improve turning radii	PE/ROW/Con	\$100	\$100		\$100	Improves truck accessibility in industrial area
RM-23	Bronzewood Avenue	Connect street over existing canal to give access for neighborhood to 15th	PE/Con	\$200	\$200		\$200	Provides alternative local circulation off Reed Market
RM-24	3rd Street at Brosterhous Road	Construct multi-lane roundabout	PE/Con	\$3,680	\$3,680		\$3,680	Will support roundabouts on Reed Market at Division and 3rd
RM-25	9th Street at Railroad	Connect street system under railroad to future road network (Footnote 1)	--	--	--	--	--	Dependent on future development
RM-26	9th Street Extension	Develop connection between road under railroad bridge to 15th Street (Footnote 1)	--	--	--	--	--	Dependent on future development
RM-26	Wilson Avenue Extension	Build new road between 15th Street and Thomas Drive as area develops	--	--	--	--	--	Provides additional roadway capacity and connectivity parallel to Reed Market Road. Dependent on future development
TOTALS				\$4,230	\$4,230	Note	\$4,230	

Note: Some or all of these projects could be developer-funded. All costs are in 2006 dollars. See Chapter 6 for discussion of cost escalation to year of construction. (Footnote 1) Project is dependent on future development activity in the area.

Table 5
Reed Market Road Corridor Study, Recommended ODOT Projects

No.	Name/Location	Description	Project Phase	Cost (\$000)	Funding Source		Budget Year	Note
					City	Other	2016-2026	
ODOT-1	In advance of Reed Market off ramp on northbound Parkway	Add signage to direct northbound through to stay in left lane. Lengthen striping to gore point for EB-to-NB on-ramp	PE/Con	\$30		\$30	\$30	Requires ODOT approval and action
ODOT-2	Northbound on-ramp to Parkway from westbound Reed Market	Make adjustments to improve sight distance	PE/Con	\$50		\$50	\$50	Requires ODOT approval and action
ODOT-3	On westbound Reed Market in advance of Parkway	Add signage to improve clarity of ramp locations for the Parkway and to indicate U-turn ahead at roundabout at Bond Street	PE/Con	\$30		\$30	\$30	Requires ODOT approval and action
TOTALS				\$110		\$110	\$110	

Note: All costs are in 2006 dollars. See Chapter 6 for discussion of cost escalation to year of construction. "Other" funding sources in this table refers to ODOT. It is important to note that no funding agreement(s) with ODOT are currently in place.

Several projects on the state highway system were also identified as part of the development of a Reed Market Road corridor strategy. These projects, assumed to be funded and developed by ODOT, are described in Table 5 and include:

- ODOT-1: Add signage on northbound Parkway approaching Reed Market Road interchange to direct through traffic to use the left lane to reduce conflicts with traffic entering and leaving the Parkway at this location.
- ODOT-2: Improve sight distance for merging onto the Parkway from the northbound on-ramp that serves westbound Reed Market Road traffic (located north of Reed Market Road).
- ODOT-3: Add signage on westbound Reed Market Road in advance of the Parkway to improve motorist comprehension of ramp locations and the availability of a U-turn ahead at the Reed Market Road/Bond Street roundabout.

1.5.4 Highlights of Funding Strategy

While the full and optimal design of Reed Market Road is important to realize over time, the total cost of constructing Reed Market Road exceeds the available funding for the project. The current City of Bend 5-Year Capital Improvement Program (CIP) allots \$8.2 million to Reed Market Road. City staff indicates that no more than \$1.64 million per year would likely be available for Reed Market Road without bonding or financing major improvements.

Projects of Reed Market Road's magnitude are typically constructed using a combination of funding and financing over several years or even decades, and they often require a combination of local, state, and federal funding participation. A deliberate phasing strategy is required to focus available local funding on portions of the corridor that benefit travelers and commerce the most.

The recommended funding strategy is to initiate strategic near-term project improvements using a "pay as you go" approach, and to attempt to leverage state and federal grants for Parkway-related improvements, and the railroad overcrossing. The funding strategies with the greatest chance of near term success likely include: local SDC updates (based on the technical findings of the Reed Market Road Corridor Study), creation of new Local Improvement Districts or Reimbursement Districts, and developer exactions. The SDC update is something the city is already pursuing and, if based on full improvements to Reed Market Road, could go a long way to filling in the funding gap for needed improvements.

The estimated construction costs for completing the build-out of the conceptual Reed Market Road improvements are expected to range from \$50 to \$55 million for Reed Market Road (in 2006 dollar amounts). There are also several additional transportation improvements off Reed Market Road that would improve safety and mobility within the corridor costing an estimated \$10 million.

It is also recommended that the City also consider revising its Transportation Policy 6 to ensure that new developments that impact major arterials such as Reed Market Road contribute an appropriate amount to failing intersections. This may entail consideration of extending the impact radius from the present level of one mile to something greater which could be proportionate to the number of PM peak hour trips a given development would generate. Conversely, larger developments could be given special consideration to determine the range and magnitude of their impacts on designated collector and arterial facilities.

1.6 PLANNING ISSUES

In addition to specific recommendations for capital improvement projects, the Reed Market Road Corridor Study has identified a number of general issues related to the planning and management of the transportation system in the southeast section of the City. These issues include recommendations for consideration in the City's next update to its Transportation System Plan (TSP), as well as other general issues.

1.6.1 TSP Issues and Amendments

Amendments to the City's Transportation System Plan that are recommended by the Reed Market Road Corridor Study include the following:

1. Identify and generally locate an extension of Brosterhous Road extending south approximately 1/2 mile from Reed Market Road to the existing Brosterhous Road. This new road should be identified as a major collector facility and should also accommodate an east/west connection to the American Lane industrial area at a minimum.
2. It is suggested that the TSP Update address the need to create a backbone transportation system of arterial and collector roads in the developing southeastern portion of the city to serve development as it occurs. This backbone system should emphasize:
 - Appropriate spacing of facilities serving major arterial, minor arterial and major collector functions.
 - Connectivity into, through and out of this section of the city to provide a link between local streets and the regional system.

Provision of an appropriately spaced and interconnected system of roads will significantly benefit travel on Reed Market Road and other major existing streets by disbursing trips over a more comprehensive network. Optimally, major collector facilities should be provided roughly every 1/2 mile (more frequently with higher densities), and arterials every 1 to 2 miles. The pending Murphy Road extension to 15th Street and/or possibly 27th Street could help to reduce future traffic growth on Reed Market Road by providing an alternative route for new and existing development in its vicinity (although it is not anticipated that it will reduce Reed Market Road traffic volumes sufficiently to alter the recommendations in this report). An assessment of traffic diversion from Reed Market Road to the extended Murphy Road should be conducted using the regional travel model when this tool is available, and, if necessary, adjustments should be made to the nature and timing of improvement recommendations in this report.

3. Evaluate and consider incorporating an extension of Wilson Avenue from 15th Street to Thomas Drive as development in this area occurs and/or at such time as the existing privately-owned airport is closed.

1.6.2 Other Planning Issues and Recommendations

Several other issues related to planning and management of the City's transportation system were identified during the Reed Market Road Corridor Study. These included:

1. Consider amending Bend Code 10-10.26 Section 26 pertaining to setback provisions along certain streets to include specific reference to Reed Market Road between the Bend Parkway and its current terminus at 27th Street and 15th Street between US 20 and Knott Road. Also note that

these provisions should include any future extension of this street east of 27th Street. This action would require a 50-foot setback on either side of the roadway centerline.

2. The City's long-range planning process should consider potential rezoning of properties along the Reed Market Road corridor, particularly west of 15th Street, where there is a strong potential for redevelopment at a higher residential density or for commercial uses. Opportunities for parcel consolidation and/or access management should be explored with property owners. These opportunities might include development of local street connections that would take advantage of the recommended new intersections to be located at 4th Street and Brosterhous/Centennial Boulevard.
3. The City's long range plan should show the proposed 4th Street extension as a new local street for the area between Cleveland Avenue and Brosterhous Road where it meets Parrell Road.
4. The City's long-range plan should also show the proposed Brosterhous Road Extension discussed above under the TSP. A connection to Centennial Boulevard on the north side of Reed Market Road should also be included.
5. As noted above, it is recommended that the City also consider revising its Transportation Policy 6 to ensure that new developments that impact major arterials such as Reed Market Road contribute an appropriate amount to failing intersections.
6. The local System Development Charge (SDC) cost assumptions should be revised, as appropriate, using the technical findings of the Reed Market Road Corridor Study, as part of the implementation strategy.