



# BEND SOUTHEAST AREA PLAN

EXISTING CONDITIONS REPORT

*January 2019*



CITY OF BEND  
SOUTHEAST AREA PLAN

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# INTRODUCTION

## PROJECT BACKGROUND

In 2016, the City of Bend updated its Comprehensive Plan and expanded the Urban Growth Boundary (UGB) to accommodate projected population growth through the year 2028. Through the expansion process, the City identified 10 “expansion areas” (shown in a red shade on Figure 1 below) totaling 2,380 acres. The Southeast Expansion Area, also referred to as “The Elbow,” was one of those expansion areas.

Following the Comprehensive Plan and UGB update process, the City evaluated strategies for implementing the new plan. The Southeast Expansion Area (“Study Area”) was identified in the City’s Return on Investment (ROI) study as being the best positioned expansion area for near-term development based on sanitary sewer investments (primarily the Southeast Interceptor) and low estimated impacts to state transportation facilities compared to other expansion areas.<sup>1</sup>

Now that the Southeast Expansion Area is inside the UGB, the City can begin planning for land use and infrastructure to meet the needs of future residents, and support future annexation and development. The goal of the Southeast Area Plan is to encourage the development of a complete community (a place where people can live, work, and play) in the southeast area of Bend.

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<sup>1</sup> In addition to recommending an area plan for the Southeast Expansion Area, the City’s ROI study recommended additional planning for Bend’s Core Area, adoption of housing incentives, and other strategies. <https://www.bendoregon.gov/Home/ShowDocument?id=38852>

## GEOGRAPHIC AREA

In relation to Bend as a whole, the Study Area is located in the southeastern corner of the UGB. It contains approximately 479 acres of land outside the City limits and inside the UGB. The area is bordered by Knott Road to the south, SE 27th Street to the east, and the current City limits to the north and west. It is expected to provide capacity for at least 820 housing units and 2,274 jobs for the City of Bend, all of which will be necessary to serve forecasted growth.<sup>2</sup>

This report compiles information about the conditions within Southeast Expansion Area boundary, but it also considers the context of Southeast Bend, the entire City, and the broader regional landscape. Figure 2 illustrates the Study Area within the context of southeastern Bend. Consideration of this context will be important to ensuring that the Southeast Expansion Area becomes a complementary and connected neighborhood in Bend.

An existing conditions map of the Study Area is presented in Figure 3. The Southeast Expansion Area includes the High Desert Park site in the southeast corner, as well as High Desert Middle School to the north. The Deschutes County Landfill and Deschutes County Road Department are adjacent to the study area on the east side of 27th Street. To the west of the study area, the school district has plans for a future middle school and high school fronting on 15th Street, and the Bend Park & Recreation District is planning for the future Alpenglow Community Park on the 37-acre site to the north. The new high school is scheduled to open in the Fall of 2021. Figure 3 also shows the planned alignment of the Murphy Road extension to 15th Street.

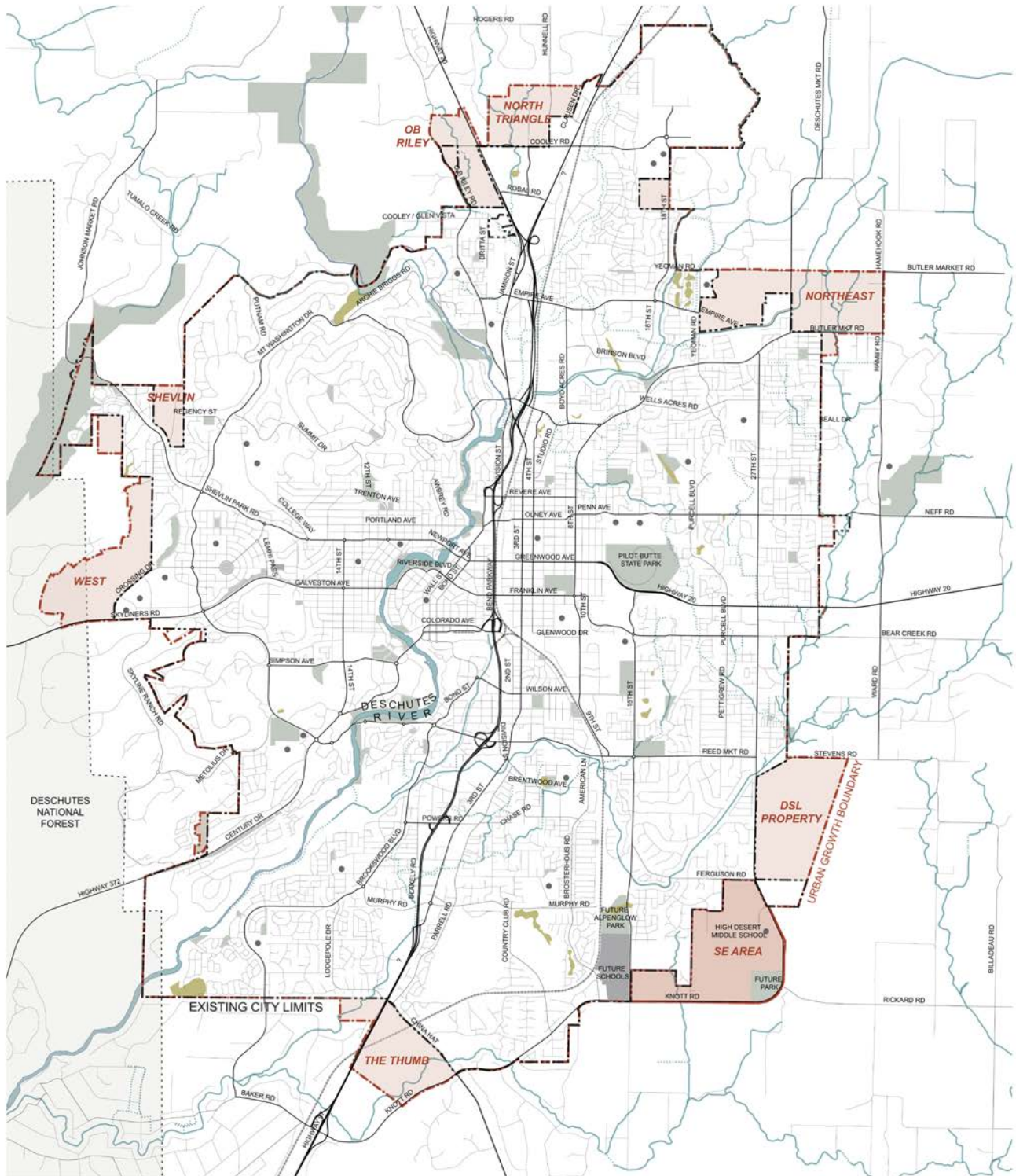
East of 15th Street and north of the study area boundary is the 15th Street Ward Opportunity Area. This property is the largest vacant residentially-designated property within Bend's City limits. Consideration of this property in discussions about east-west transportation connections through the Study Area will be particularly important to ensuring a connected, complete community.



*Native shrubs and trees in the Southeast Expansion Area*

<sup>2</sup> Table 2 of the ROI study provides estimated capacity for housing units and jobs in the UGB expansion areas. <https://www.bendoregon.gov/Home/ShowDocument?id=38852>

Figure 1. Citywide Context



CITY CONTEXT



- Railroad
- Schools
- Existing City Boundary
- Area of Special Interest
- Urban Growth Boundary
- Project Area
- National Forest
- Parks
- Future Expansion Areas
- Canal
- Piped Canal

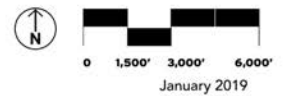
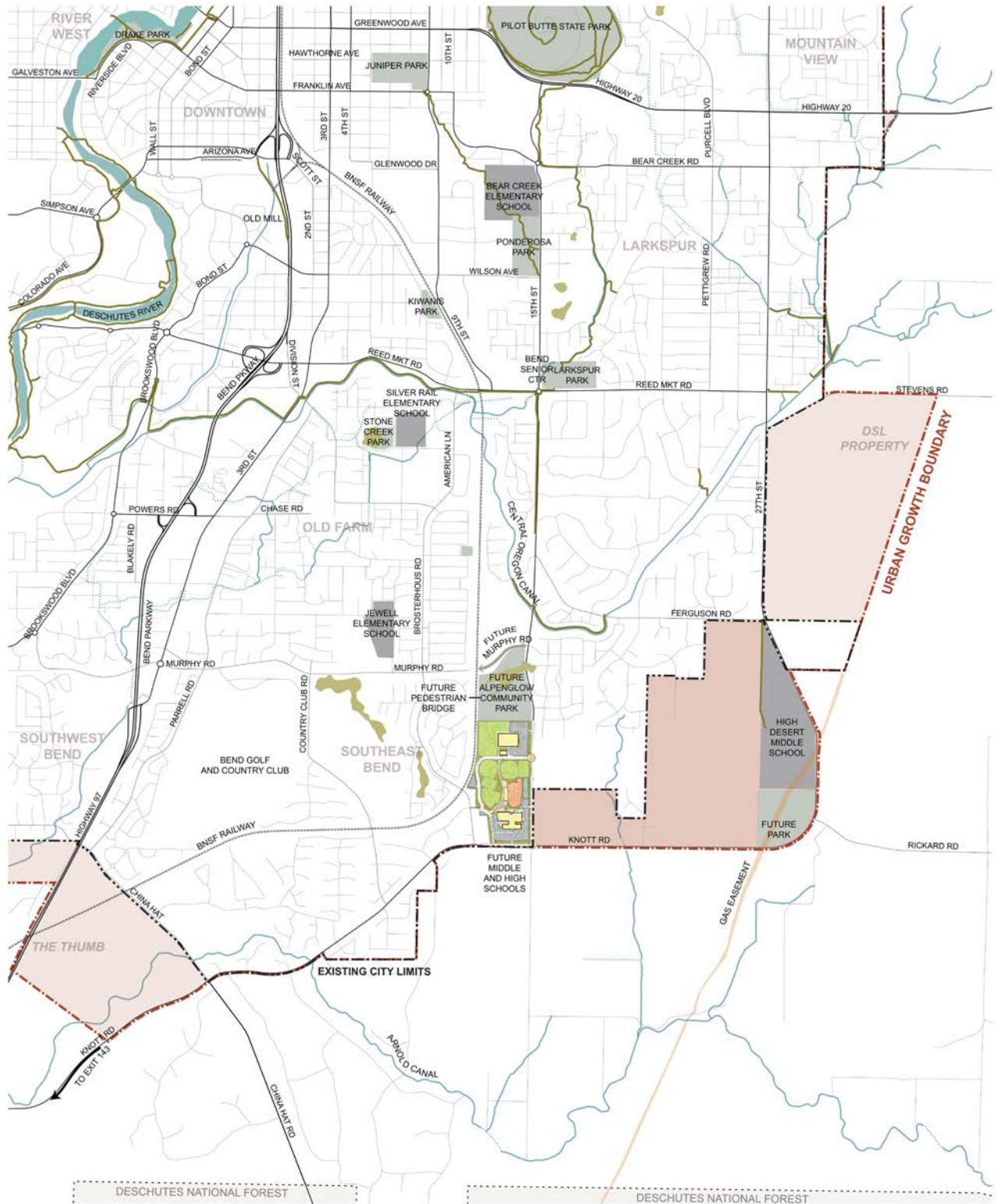


Figure 2. Southeast Bend Context



## SOUTHEAST CONTEXT

- Railroad
- Existing Trail
- Schools
- National Forest
- Existing City Boundary
- Urban Growth Boundary
- Parks
- Area of Special Interest
- Project Area
- Future Expansion Areas
- Piped Canal
- Canal

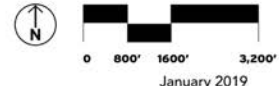
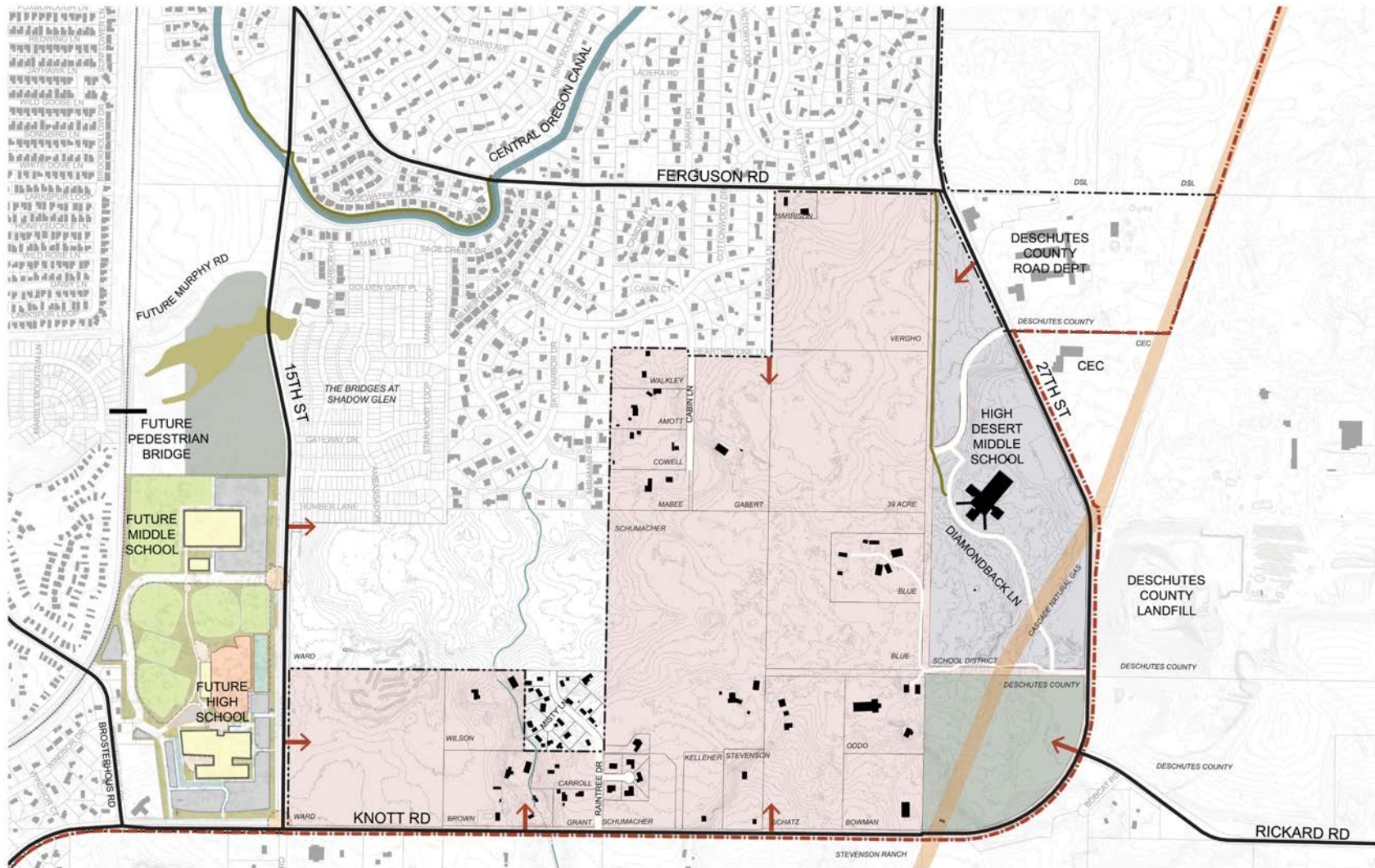


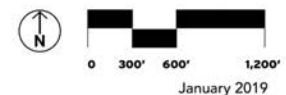
Figure 3. Study Area



**STUDY AREA**



- Railroad
- Utility Easement
- Existing Trail
- Future Parks
- Existing City Boundary
- Urban Growth Boundary
- Existing Road in Project Area
- Area of Special Interest
- Existing Buildings (2004)
- Proposed Road Connection
- Existing Major Road
- Existing School
- Piped Canal
- Contours 2 ft Interval
- DSL Property Owners
- Study Area
- Canal
- Tax Lots



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# REGIONAL PHYSICAL SETTING

Bend is situated in a dramatic regional landscape between the coniferous forest and volcanoes of the high Cascades and the arid high desert that extends east to Idaho and Nevada. The Three Sisters are regional landmarks and views of these and other volcanoes on the western horizon are highly-valued. Other mountains aren't as prominent but still provide place markers for the region's identity. Public lands are cherished as intrinsic elements of the region's character and active recreational access to these lands is touted as a key part of Bend's livability. The study area is close to the Deschutes National Forest boundary, with opportunities for recreation and exploration of unique geological landmarks like buttes, basalt outcrops and ice caves. On this southeastern edge of the city, small farms and ranches, irrigated by canals, are layered between rapidly urbanizing neighborhoods and the national forest and Bureau of Land Management (BLM) boundaries.

## NATURAL RESOURCES

Bend is characterized by an arid climate, with the southeastern portion of the City trending slightly colder than neighborhoods to the north and west. The area's natural vegetation consists primarily of juniper trees, ponderosa pines, and native grasses and small shrubs including sagebrush and bitterbrush. The Study Area's topography generally slopes from a high point near Cabin Lane to a low point at the High Desert Park site in the southeast corner, with an elevation drop of approximately 70'. A subtle break in drainage exists, with the three westernmost properties draining west and the rest of the area draining to the southeast. The topography is complex in places,

with basalt rock outcrops and steeper ridges running generally in a north-south orientation. Topography for the study area is shown on Figure 3.

The Central Oregon Canal, operated by the Central Oregon Irrigation District (COID) runs north of the study area, crossing SE 15th Street and Ferguson Road. One small canal runs through the study area: the Arnold Irrigation District's Ladera Lateral runs north from Knott Road to Cabin Lane for irrigation water deliveries.

## Signature Trees and Tree Groves

Much of the land within the Southeast Expansion Area includes mature and healthy trees, with several notably large ponderosa pine and juniper trees. Ponderosa pines in particular are relatively hardy and can survive with redevelopment if roots are protected and adequate water continues to be available. A detailed survey of tree locations and sizes may be commissioned as an adjunct to this plan. Some private parcels include a wider range of ornamental trees, such as the Gabert property on Cabin Lane (see Figure 3), which was once a tree nursery and still hosts a grove of blue spruce trees.

## Rock Outcrops

The Southeast Expansion Area includes several notable large rock outcrops. These rock outcrops may pose challenges to the provision of infrastructure and utilities such as roads, but they also provide a distinct character to the area, special habitat conditions for native wildlife, and a reminder of the region's volcanic underpinnings. These outcrops have been successfully incorporated into other local parks and open spaces and historically have been protected within Areas of Special Interest (ASIs), which are discussed later in this report.

## Views

Figure 6 below shows views visible from key points in the Southeast Expansion Area. Looking south, Horse Butte, Cabin Butte, Bessie Butte, and Paulina Peak can all be seen from Knott Road. Mt. Bachelor and the Three Sisters peaks can be seen looking west from various high points throughout the study area. Where possible, these views should be protected and enhanced by future development in the area.



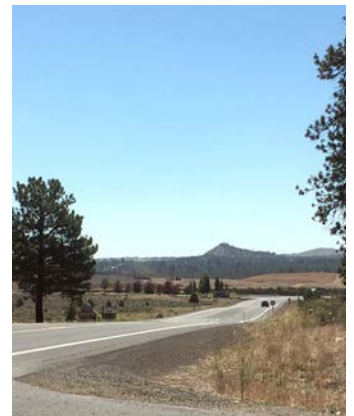
*Mature juniper tree in the Southeast Expansion Area*



*Basalt rock outcrop in the High Desert Middle School site*



*View of Cabin Butte from Diamondback Lane*



*View of Horse Butte from SE 27th Street*

Figure 4. Regional Landscape Context

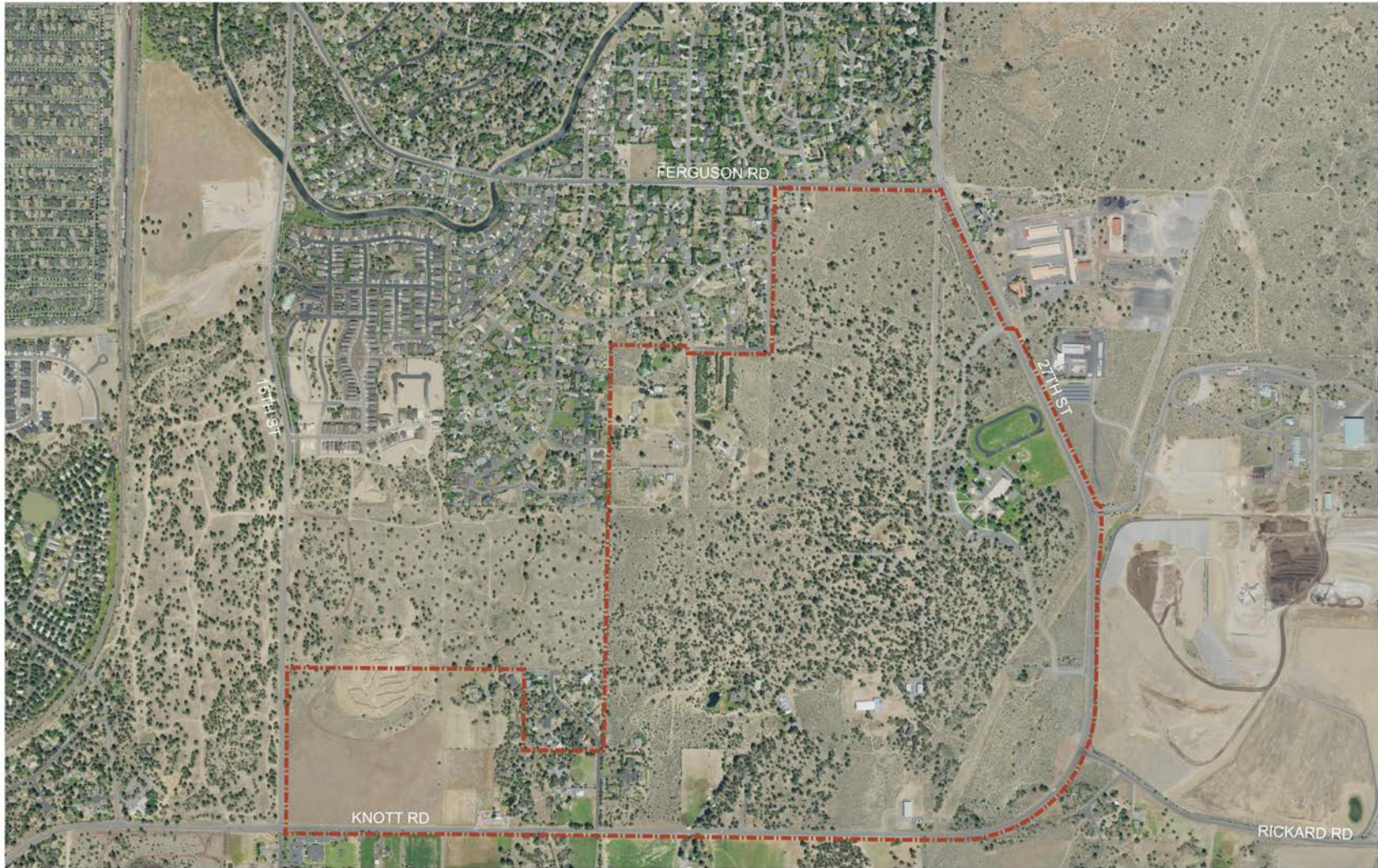


REGIONAL LANDSCAPE CONTEXT



January 2019

Figure 5. Study Area – Aerial



## STUDY AREA AERIAL



--- Study Area

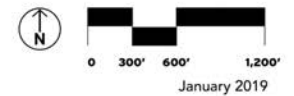
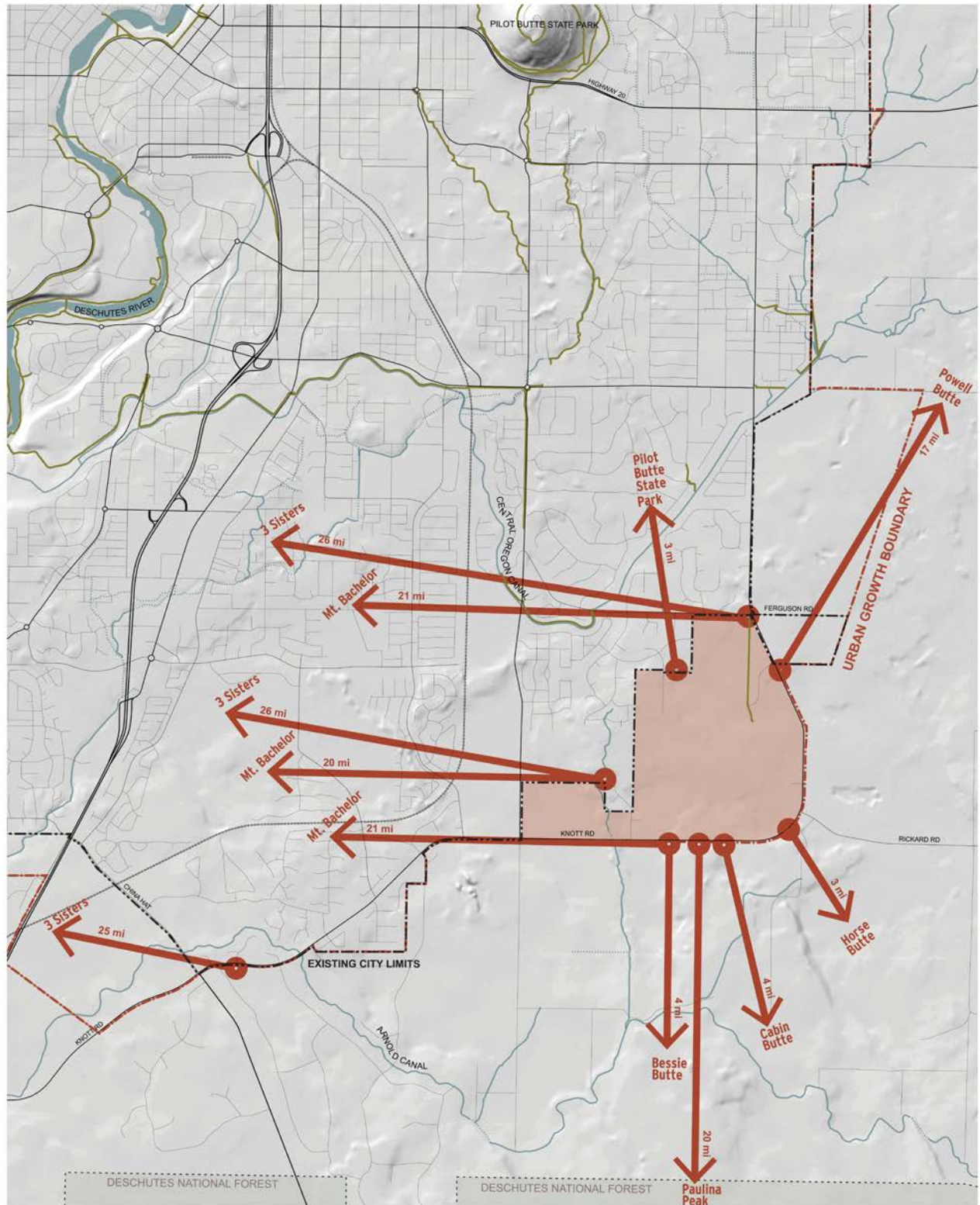


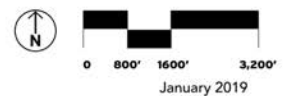
Figure 6. Views from the Southeast Expansion Area



**SOUTHEAST CONTEXT VIEWS**



- Railroad
- Existing Trail
- Project Area
- Deschutes National Forest
- Existing City Boundary
- Urban Growth Boundary
- Views
- Canal
- Piped Canal



# EXISTING LAND USE PATTERNS

The Southeast Expansion Area consists of approximately 446 developable acres divided into 30 parcels that are owned by 27 different property owners. The largest parcel is the 74.5-acre lot owned by the Bend-La Pine School District, and the smallest parcels are the five roughly one-half-acre lots that make up the Knott’s Landing subdivision on Keller Court. Although the average lot size in the Study Area is roughly 14 acres, only 10 of the 30 properties that make up the area are over 10 acres.

Having only recently been brought into the City’s UGB the area is still largely undeveloped. Where development does exist, it is rural in nature. Active land uses in the area are primarily residential, with some existing businesses and institutional uses, including the middle school, future park site, and the Bend Bowmen Club. The area includes two existing businesses: High Desert Veterinary and the Bend Pet Resort.



*Residence in the Southeast Expansion Area*

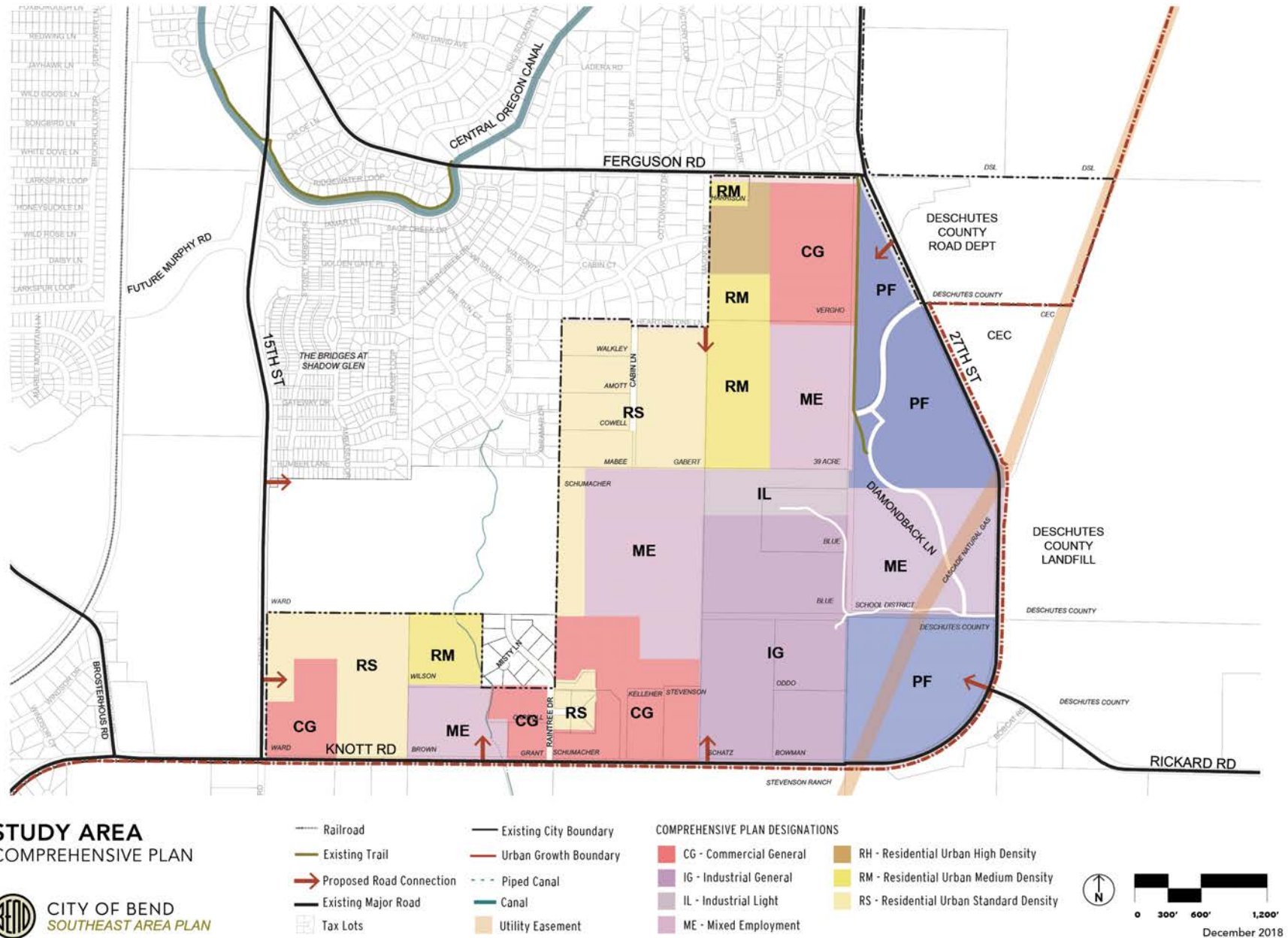
## Land Use Districts

As shown in Figure 7, the Southeast Expansion Area includes residential, industrial, employment, commercial, mixed use, industrial, and public facilities comprehensive plan designations. These plan designations were adopted as part of the City’s 2016 Comprehensive Plan amendments at the end of the UGB update process. They are the starting point for refinements that can be considered in the SEAP process. For more detailed information about the policies for each land use district in the Study Area, refer to Chapter 2 of Bend Development Code, Land Use Designations (BDC 2.0-2.8).



*Land uses in the Southeast Expansion Area*

Figure 7. Land Use Districts in the Southeast Expansion Area



## AREAS OF SPECIAL INTEREST

Areas of Special Interest (ASIs) are important landscape features identified by the City of Bend that are intended to be preserved as potential private and public open spaces as growth occurs. The southeastern area of the City includes several areas that fall inside the Upland Areas of Special Interest Overlay Zone. The Overlay Zone is intended to protect valuable natural resources within the UGB while ensuring reasonable use of the property. Bend Development Code (BDC) establishes clear and objective design and development standards to protect these resources and preserve and enhance this vision for Bend's future livability .

There are no ASIs identified within the Southeast Expansion Area because it was not included in the UGB when the original ASI inventory was conducted. In the vicinity, a significant portion of the future Alpenglow Community Park site (shown in the study area map in Figure 3 on page 5) to the west of the Expansion Area is mapped as Upland ASI. Upland features consist of scattered rock outcrops, stands of trees, and dominant ridges and faults that are typical of the Central Oregon landscape. These areas contain high points or changes in elevation that break the line of sight so that the area retains a feeling of undeveloped open space.



*ASI in the Alpenglow Community Park site.*





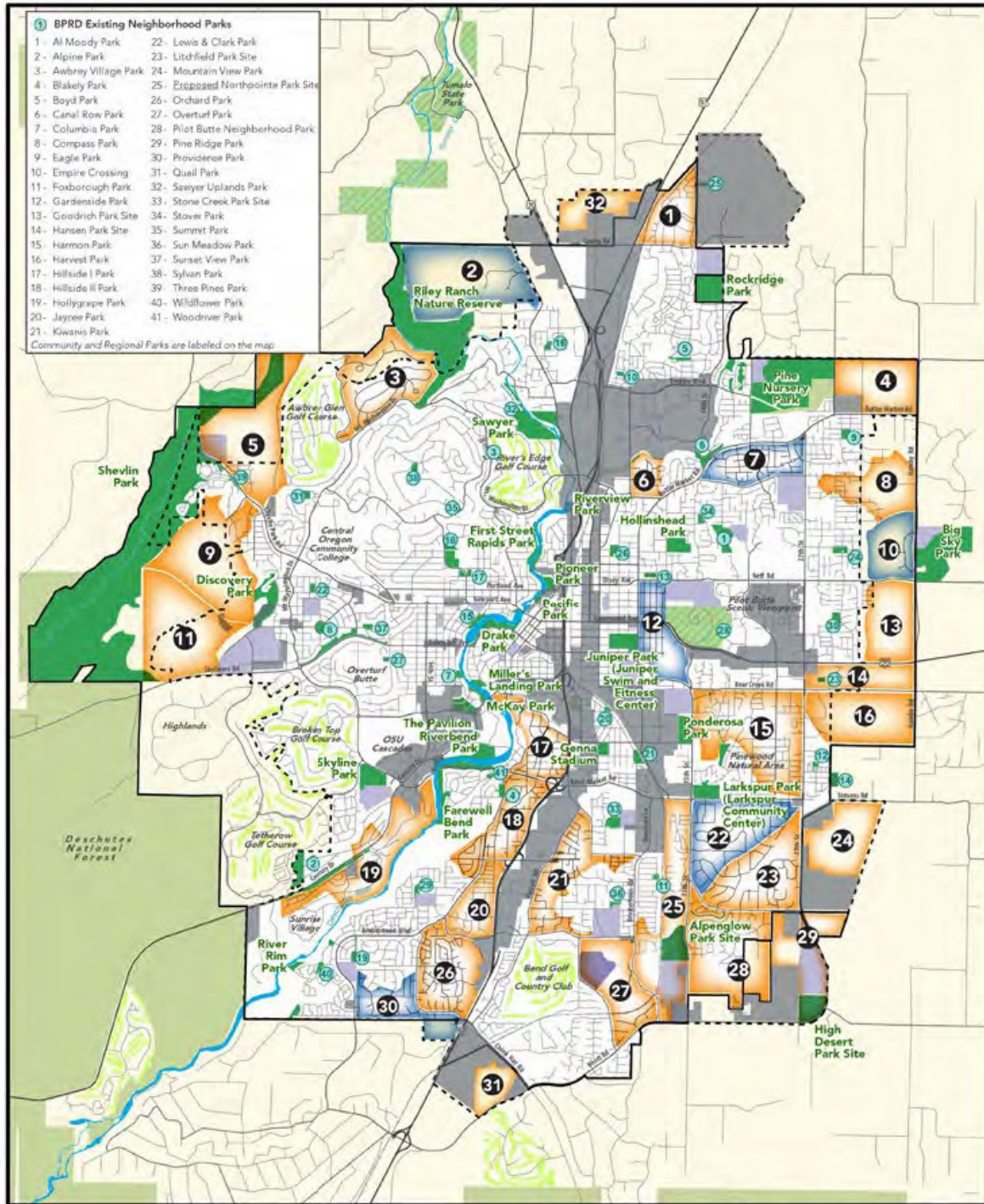
# PARKS, OPEN SPACES, AND TRAILS

Bend is a community that places a high value on park and recreation opportunities. For the SEAP, it will be important to identify and preserve areas for parks and open spaces within the Southeast Expansion Area to serve future residents. The Bend Park & Recreation District (BPRD) updated their Comprehensive Plan—which serves as the guiding document for the next ten years of parks and recreation in Bend—in July 2018. The plan addresses future population growth by planning for more parks, trails, and amenities to serve future residents.

## PARKS AND OPEN SPACES

Currently, 33 acres of the Study Area are owned by the BPRD. These acres make up the High Desert Park site, discussed in more detail below. The plan also identifies areas that are or will be deficient in neighborhood park facilities by defining “search areas” within the City. The BPRD has identified two park search areas which overlap partially with the Southeast Expansion Area. These are park search areas #28 and #29, shown in Figure 8. BPRD would look to acquire and develop neighborhood parks within these areas, to allow residents close-to-home opportunities to recreate and gather together. Neighborhood parks average about four acres in size and typically include amenities such as playgrounds, open lawn areas, and picnic shelters.

Figure 8. Bend Park & Recreation District Comprehensive Plan - Park Search Area Map



Park Search Area #	Page #	Area 10	101	Area 22	105
Area 1	93	Area 11	99	Area 23	104
Area 2	105	Area 12	102	Area 24	102
Area 3	89	Area 13	103	Area 25	87
Area 4	102	Area 14	93	Area 26	103
Area 5	102	Area 15	104	Area 27	99
Area 6	98	Area 16	103	Area 28	99
Area 7	97	Area 17	98	Area 29	98
Area 8	102	Area 18	99	Area 30	101
Area 9	104	Area 19	103	Area 31	104
		Area 20	98	Area 32	104
		Area 21	103		

**Legend:**

- 1** Park Search Areas\* (Including Future Park Sites Already Owned by the District)
- 1** Improved Crossings\* to Access Existing Parks
- Non-Residential Areas Commercial and Industrial - Bend Comprehensive Plan

\*Park and crossing locations are approximate and subject to change.

Date: May 2018; Map Prepared by MIG, Inc. Source: Bend Park & Recreation District, 2018

Scale: 0 0.25 0.5 1 1.5 2 Miles

## Planned Parks and Open Spaces

### HIGH DESERT PARK SITE

To meet future demand for park and recreation opportunities in the Southeast Expansion Area, the District has identified High Desert Park as a future community park on the existing 33-acre site owned by BPRD in the southeast corner of the Study Area. BPRD acquired the site in 1992 as part of a land swap, which included a deed restriction with Deschutes County stating that the land should be used for public purposes.

BPRD had previously planned for the site to be developed as the High Desert Sport Complex, similar to Pine Nursery or Big Sky Park, with fields and lighting in order to take advantage of the adjacent employment land and transportation network.

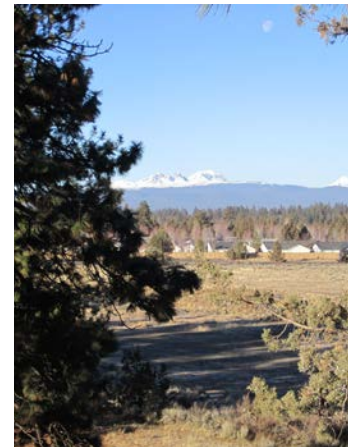
The currently undeveloped park site is located outside the District boundary across from the Deschutes County landfill site. It is located one-quarter mile from High Desert Middle School and has native tree and shrub cover and several notable basalt rock outcrops. A TransCanada gas pipeline easement crosses the property. The SEAP will need to evaluate how the park site can work with a future road connection to Rickard Road, as shown on the City’s Transportation System Plan Map for the roadway network.



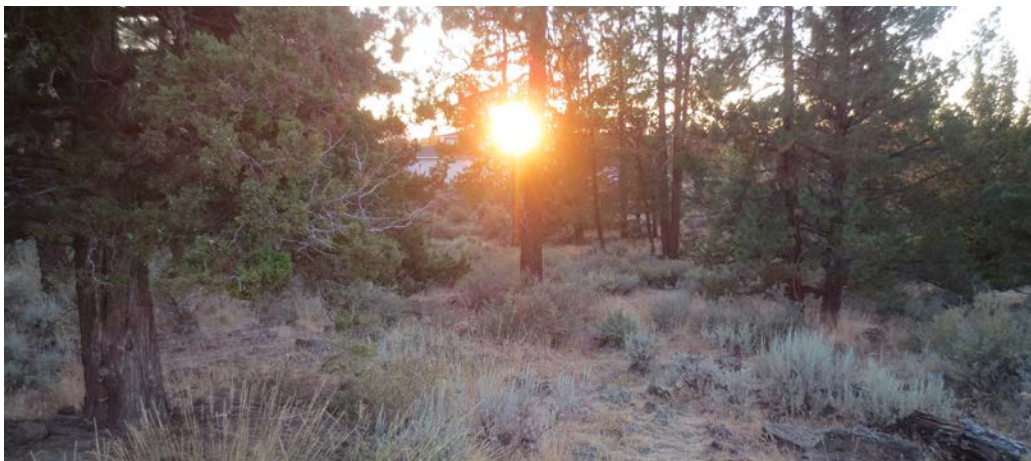
*High Desert Park site*

### ALPENGLLOW COMMUNITY PARK

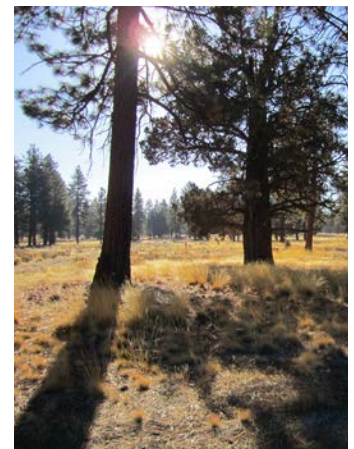
Planning and design for the future Alpenglow Park is currently underway, with estimated completion in 2021. The 37-acre future park site is located west of the study area on the west side of SE 15th Street and is characterized by semi-arid high desert vegetation with mature stands of ponderosa pine, junipers, and a basalt ridge designated as an ASI by the City. The park is planned to include natural areas, large open turf play areas, picnic sites, parking, restrooms, and other unique amenities as identified through the planning, design, and public involvement processes.



*Alpenglow Community Park site*



*Alpenglow Community Park site*



*Alpenglow Community Park site*

## TRAILS

Figure 10 from the BPRD Comprehensive Plan illustrates existing and planned trails in Bend. There is one existing paved trail located inside the Southeast Expansion Area, which runs south from Ferguson Road to the High Desert Middle School (illustrated on Figure 3).

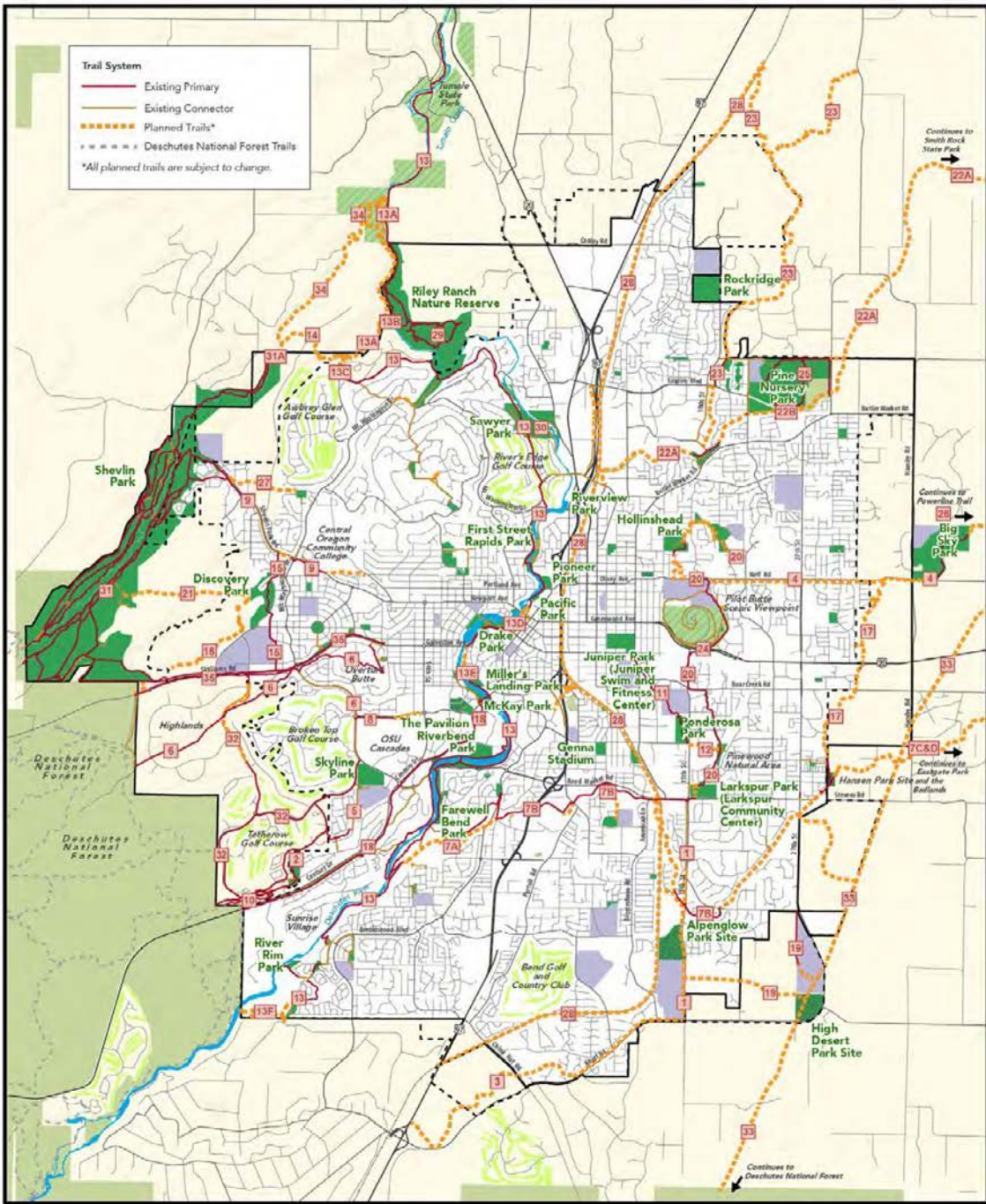


*Existing trail looking north*



*Terminus of the existing trail at High Desert Middle School, looking south*

Figure 10. Bend Park & Recreation District Comprehensive Plan - Trails Plan



SUMMARY

Trail Plan Map #	Page #				
1- 15th Street Trail Connector	114	12- Coyer to Larkspur Connector	114	21- Manzanita Trail	101
3- Arnold Canal Trail	97	13A- Putnam to Riley Ranch Nature Reserve (RRNR) Bridge	89	22A- North Unit Canal Trail	99
4- Big Sky Park Trail	114	13B- DRT Trailhead	89	22B- Pine Nursery North Unit Canal Bike/Pedestrian Bridge	100
7A- Central Oregon Historic Canal Trail (COHCT) Blakely Rd. to Deschutes River Trail (DRT)	88	13C- Kirkaldy to Putnam	89	23- Pilot Butte Canal Trail	100
7B- COHCT Blakely Rd. to Hansen Park	88	13D- Drake Park to DRT	89	26- Powerline Trail	108, 114, 116
7C- COHCT Hansen Park to Eastgate Park	88, 114	13E- Galveston to Miller's Landing	90	27- Quail Trail	105
7D- COHCT Eastgate Park to the Badlands	88, 114	13F- South UGB DRT	90, 109	28- Rail with Trail Corridor	114
8- Century Trail	114	14- DRT Connector to Shevlin Park	107	31A- Shevlin Park North - Tumalo Creek Bike/Pedestrian Bridge	106
9- COCC Shevlin Trail	114	16- Discovery West Trail	97	33- TransCanada Trail	106, 116
		17- Hansen to Big Sky Trail	101, 116	34- Tumalo Creek Trail	108
		18- Haul Road Trail	91		
		19- High Desert Park Trails	98		

Date: May 2018; Map Prepared by MIG, Inc. Source: Bend Park & Recreation District, 2018.

0 0.25 0.5 1 1.5 2 Miles



MAP 4: Trail Plan

## Planned Trails

### **HIGH DESERT PARK TRAILS (TRAIL PROJECT #19)**

BPRD plans develop two sections of trail connecting to the High Desert Park site. One section will connect from the future TransCanada Trail alignment in High Desert Park (discussed in more detail below) to the SE 15th Street and the planned 15th Street Trail. The second section is a continuation from existing trail from Ferguson Road to High Desert Middle School, connecting to the future TransCanada Trail and continuing south to High Desert Park. These planned trails would provide key pedestrian connections to and through the Study Area.

### **TRANSCANADA TRAIL (TRAIL PROJECT #33)**

This trail, shown in Figure 10, is planned to run adjacent to the TransCanada high pressure gas line easement that crosses through the High Desert. The trail would connect to U.S. Forest Service (USFS) land to the south and to the Department of State Lands (DSL) property to the north. This trail project is not in the District's Capital Improvement Program (CIP) as it is expected to require more time than the 10-year planning horizon of the BPRD Comprehensive Plan.

### **15TH STREET TRAIL CONNECTOR (TRAIL PROJECT #1)**

This trail, shown in Figure 10, would run parallel to SE 15th Street. Because it would be located within the City or County right-of-way, segments of this trail would not be developed or operated by BPRD but is still shown on the District's map because of its connection to other BPRD-operated trails. BPRD will build and maintain the portion of the 15th Street Connector Trail along Alpenglow Park and north to the Central Oregon Historic Canal Trail. This trail connection would provide important pedestrian access from the Southeast Expansion Area to other parts of the City.

### **ARNOLD CANAL TRAIL (TRAIL PROJECT #3)**

The planned Arnold Canal Trail, shown in Figure 10, would run parallel to Arnold Irrigation Canal Trail through southeastern Bend. The trail would start at Highway 97 and connect to the 15th Street Trail Connector at the intersection of SE 15th Street and Knott Road in the southwestern corner of the Study Area. BPRD hopes to designate this planned trail for off-leash dog use in order to meet the public's unmet need for an off-leash dog trail within the District.



# SCHOOLS

In 2017, the Bend-LaPine School District revised their adopted 2016 Sites and Facilities Report , which includes an inventory of existing elementary, middle, and high schools and projected future needs. The inventory shows 74.5 acres of the Southeast Expansion Area are currently owned by the District. The northern portion of this ownership is occupied by the High Desert Middle School. The southern portion of the site—approximately 30 acres bordering the High Desert Park Site to the south—is currently vacant and designated Mixed Employment.

The District recently received land use approval for a new high school and middle school to be located west of SE 15th Street (Figure 11). Planning for the high school is underway and is expected to be open as soon as the fall of 2021. As part of the development of this project the District plans to build a roundabout at the intersection of SE 15th Street and Knott Road, which is a project need that has been identified through the City’s Transportation System Plan (TSP) update process.

East of 15th Street, the District has identified 21 acres for a future elementary school in the DSL expansion area located northeast of the Study Area (shown on Figure 1). Another elementary school will be needed in the Southeast Expansion Area to serve future residents.







# EXISTING AND PLANNED TRANSPORTATION CONDITIONS

The Southeast Expansion Area is bordered by Knott Road to the south, and SE 27th Street to the east. SE 15th Street runs north-south along the westernmost edge of the study area, and Ferguson Road runs east-west to the north. Rickard Road connects to SE 27th Street/Knott Road at the High Desert Park site and continues southeast outside the UGB. Only three local roads—Raintree Court, Diamondback Lane, and Cabin Lane—currently extend into the Study Area, which otherwise lacks an internal street network.

SE Knott, SE 15th, and SE 27th are designated as Minor Arterial streets in the Bend TSP. Ferguson and Rickard Roads are designated as Collectors. The TSP also identifies several future collectors through the Study Area to serve local circulation and reduce reliance on the higher speed arterial streets. The alignment of the future collectors within the Study Area are preliminary and will be refined during the SEAP process. Additionally, the SEAP process may consider a new “Neighborhood Collector” classification for internal streets running east-west through the study area. A number of these key roadways have been identified as needing safety and capacity improvements and upgrades, and as previously rural streets, they will likely need to be improved to the urban standard.

## TRANSPORTATION SYSTEM PLAN PROJECTS

The City's adopted Transportation System Plan (TSP) , completed in 2001 and updated in 2016, identifies ten new roadway projects connecting to and through the Southeast Expansion Area, as shown in Figure 12 below. These projects include:

- Extension of Murphy Road to SE 15th Avenue
  - Work planned for summer 2019 through summer 2021
  - This extension is critical to improving response times for police and fire, as well as services for parks and schools
- 211 – New Collector Road
- 213 – New Collector Road
- 214, 214 b, and 214c – New Collector Road
- 215a – New Collector Road
- 224 and 224a – New Collector Road
- 225 – New Collector Road
- 226 – Extension of Magnolia Lane
- 234 and 235 – Extension of Raintree Court

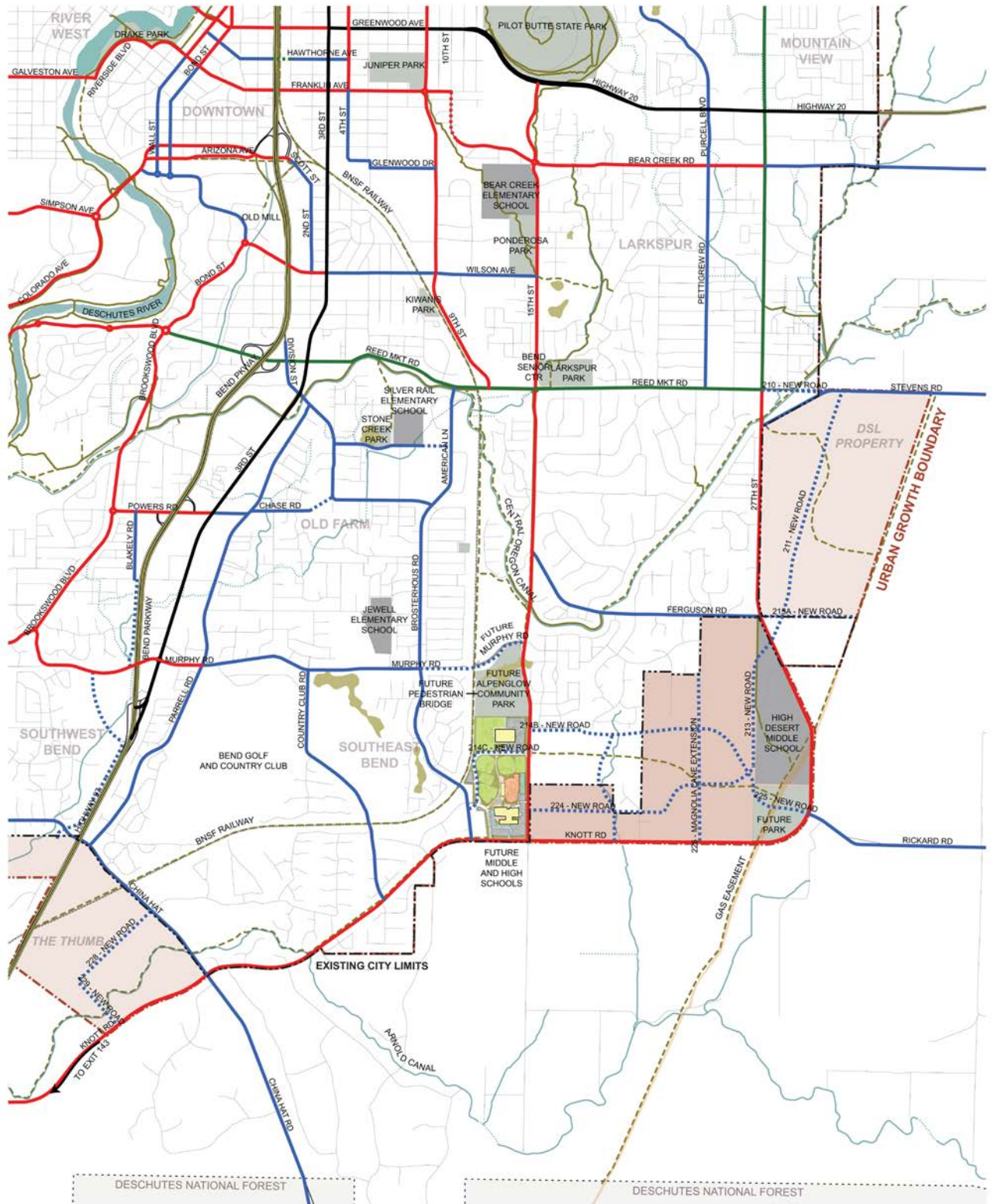
The City is currently in the process of updating their TSP , which is expected to be completed and adopted by February 2020. The Southeast Area Plan and the TSP update are being conducted in close coordination by City staff, and projects and recommendations from both projects will inform each other throughout the process.



*Pavement conditions on Raintree Court*

# EXISTING AND PLANNED TRANSPORTATION CONDITIONS

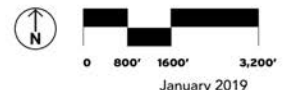
Figure 11. Transportation System Plan Street Classifications and Projects in Southeast Bend



## SOUTHEAST CONTEXT TRANSPORTATION SYSTEM PLAN



- Railroad
- Existing City Boundary
- Piped Canal
- Major Collector
- Planned Trail
- Urban Growth Boundary
- Expressway
- Proposed Major Collector
- Existing Trail
- Parks
- Major Arterial
- Project Area
- Area of Special Interest
- Minor Arterial
- Future Expansion Areas
- Canal



January 2019

## ACTIVE TRANSPORTATION CONDITIONS

### Low Stress Bike Network

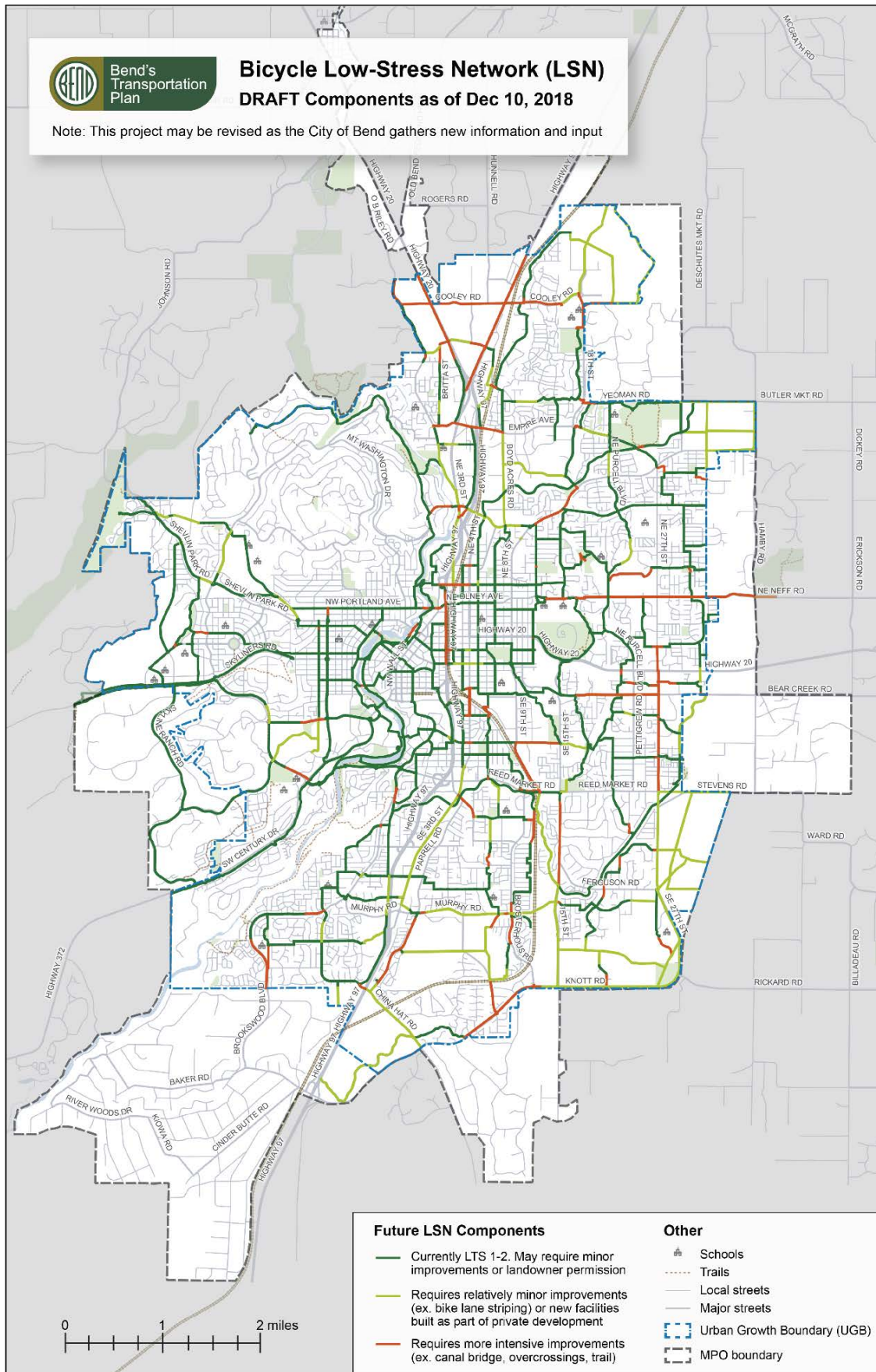
The Low-Stress Bicycle Network (LSN) is a proposed future network of bikeways that would enable more Bend residents to get around the city safely and comfortably by bike. The network consists of bicycle facilities that are typically south after by the average person when considering a trip by bicycle, such as off-street paths and trails. The LSN takes a systematic approach to provide bicycle infrastructure using cost-effective design techniques on routes intersections, and roadways crossings in order to enhance safety, increase ridership, and facilitate livability in the City of Bend. The low-stress network, including recommended projects, implementing policies as well as design guidelines and standards, is being considered as part of the TSP update process.

The Southeast Expansion Area, given its location outside of current city limits and undeveloped nature, does not include many low-stress bicycle facilities. Existing facilities for cycling are primarily shoulder lanes on high-speed streets, as shown in the image below. There is currently just one facility within the expansion area that is identified as part of the low-stress network. This facility is the paved path that runs south from Ferguson Road to the High Desert Middle School. This path dates back to the 1980's; however, it has remained isolated and is not adequately connected to existing nearby neighborhoods. Through the area planning process, there will be an opportunity to identify and plan low stress bicycle routes in the expansion area and connections into the larger city network of low-stress bicycle routes.



*Knott Road looking west*

Figure 12. Draft Low Stress Network Map



## Walksheds and Bikesheds

The typical walkshed is defined as a 5-minute, or ¼-mile walk, often expressed as a radius from or to destinations. This can serve as a useful structure for neighborhood planning by organizing neighborhoods around convenient walks to retail, neighborhood parks, transit stops and other neighborhood destinations. A wider radius, up to 15 minutes, could be considered for walking to larger community parks and schools—such as those planned west of SE 15th Street—and could also guide the shaping of ‘safe routes to school’ within that radius. Natural features such as trees groves or rock outcrops, canals, and major roadways can all present challenges to direct walking and biking routes, but in the Southeast Expansion Area topography is likely the primary constraint to access, especially across the steep ridges that run north-south from Knott Road.

Bikesheds tend to be more difficult to quantify due to a wide range in users’ abilities, speeds, and the purpose of rides (i.e. for leisure, exercise, or commuting) but a standard bikeshed is commonly defined as a 15-minute bike ride at 10 miles per hour, or approximately 2.5 miles (roughly the distance from the Old Mill District to Alpenglow Community Park). Anecdotally, children bike across the Study Area on mountain bikes from The Bridges subdivision to High Desert Middle School, which is roughly a one-mile distance. The Southeast Area Plan can consider and include safe bike routes throughout because the entire Study Area is within a reasonable biking distance to the future Alpenglow Park and future middle and high schools on SE 15th Street.



*Cyclist on Knott Road*



# UTILITIES

## WATER

### Avion Water

Avion Water is the primary water provider for the Southeast Expansion Area. They recently constructed a new well on China Hat Road and are planning to extend a 24-inch water line that currently runs along Knott Road to the north and east to provide additional capacity for future growth on the east side of Bend. A map of Avion Water lines is shown in Figure 13

### Arnold Irrigation District

Arnold Irrigation District (AID) is the irrigation district delivering irrigation water to areas in the south of Bend and south of the city limits, including the Southeast Expansion Area, which falls within AID's zones 1 and 3 (Figure 14). AID has a lateral, referred to as the Ladera Lateral that runs north of Knott Road into the Southeast Expansion Area.

## Drinking Well Locations

The study area contains a few private drinking water/irrigation wells, shown in Figure 15. The locations of these wells were recently field verified by City staff. For larger wells, such as those owned by the City of Bend, Avion Water, or Roats, surveys are done to model wellhead protection areas. If a water quality pollutant were to reach the underground drinking water aquifer, there is a period of time that pollutant could potentially be expected to be drawn up into the well. These are expressed typically as 1-year, 2-year, 5-year, or 10-year time of travel areas. For smaller wells that are not formally modeled, the State places a 500-foot wellhead protection buffer around the well. Figure 15 demonstrates the mapped locations of water and irrigation wells within and adjacent to the Southeast Expansion Area.

Oregon well construction standards (OAR 690-210-0030) require wells to be drilled at least fifty feet away from storm drainage systems (except for rain water gutter downspouts and drains that can be closer). However, other Oregon Administrative Rules (OAR 340-44) state that any stormwater Underground Injection Controls (UIC), such as dry wells or drill holes, cannot be located within 500-feet of a drinking water/irrigation well without a permit. Most UICs are able to obtain rule authorization rather than a permit, but this is not available if the UIC is within 500 feet of a domestic, irrigation, or industrial water supply well. In Bend, per Bend Code Title 16, if a water well is placed in a location that makes an existing stormwater drywell no longer able to be rule authorized, then the UIC owner can seek payment from the water well owner for the difference in cost between the rule authorization and permit compliance requirements.

These well locations are important to consider as road alignments and necessary stormwater drainage and infrastructure within the project area are identified. The City often uses dry wells or drill holes to manage stormwater. These will not be allowed within the 500 foot protection buffer of these verified well locations.



Figure 13. Avion Water Company Line Sizes

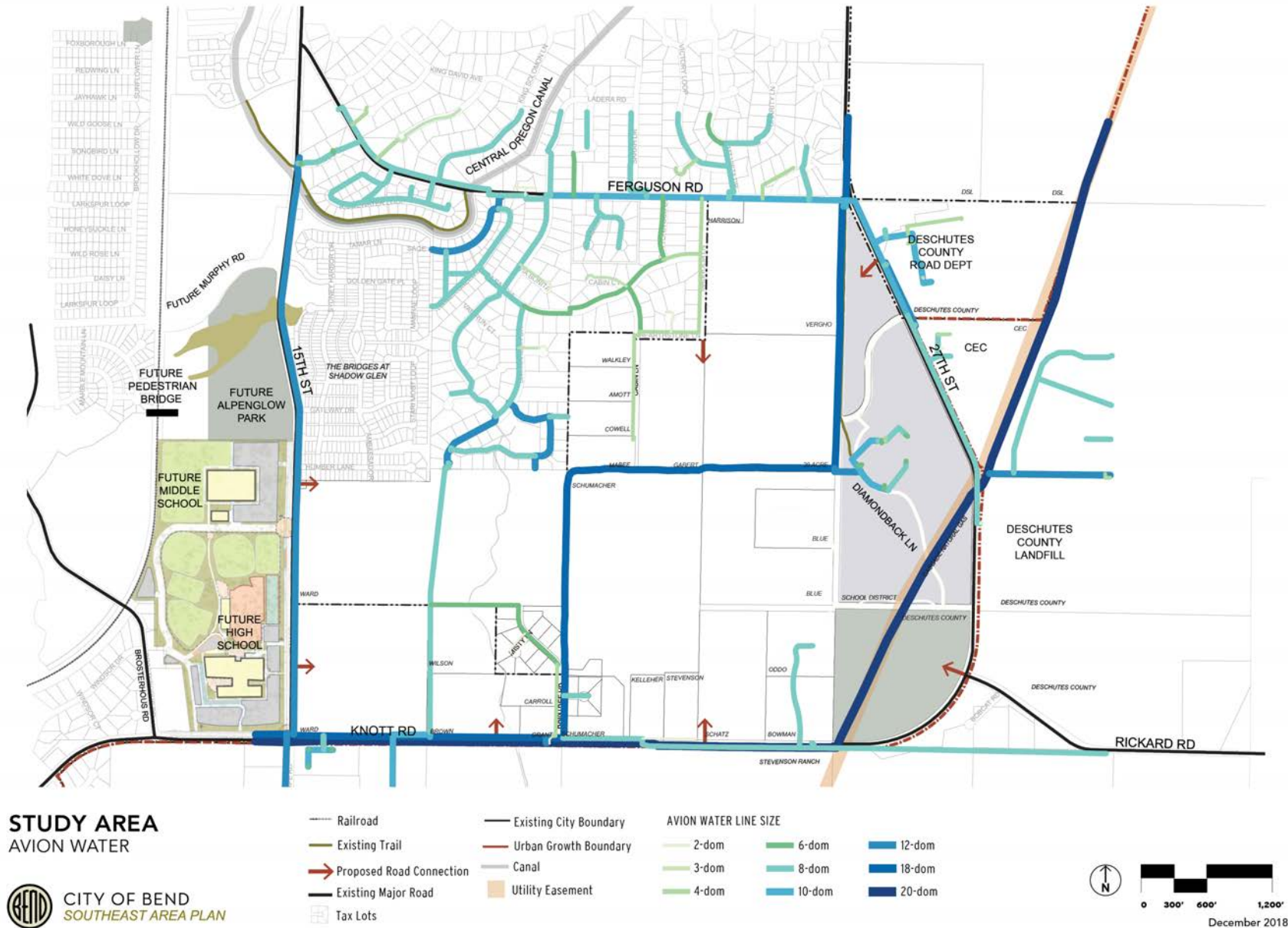


Figure 14. Arnold Irrigation District Map

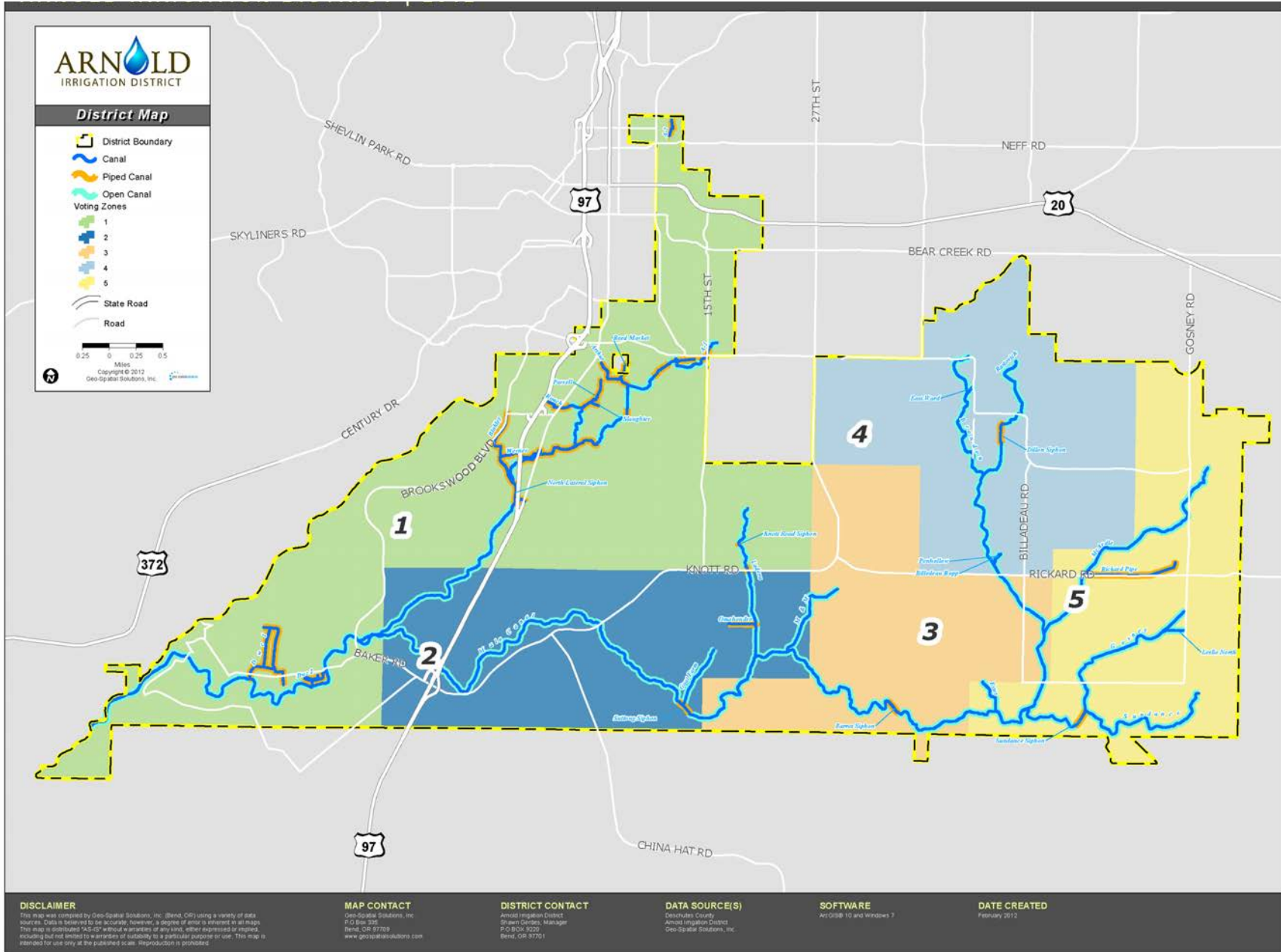
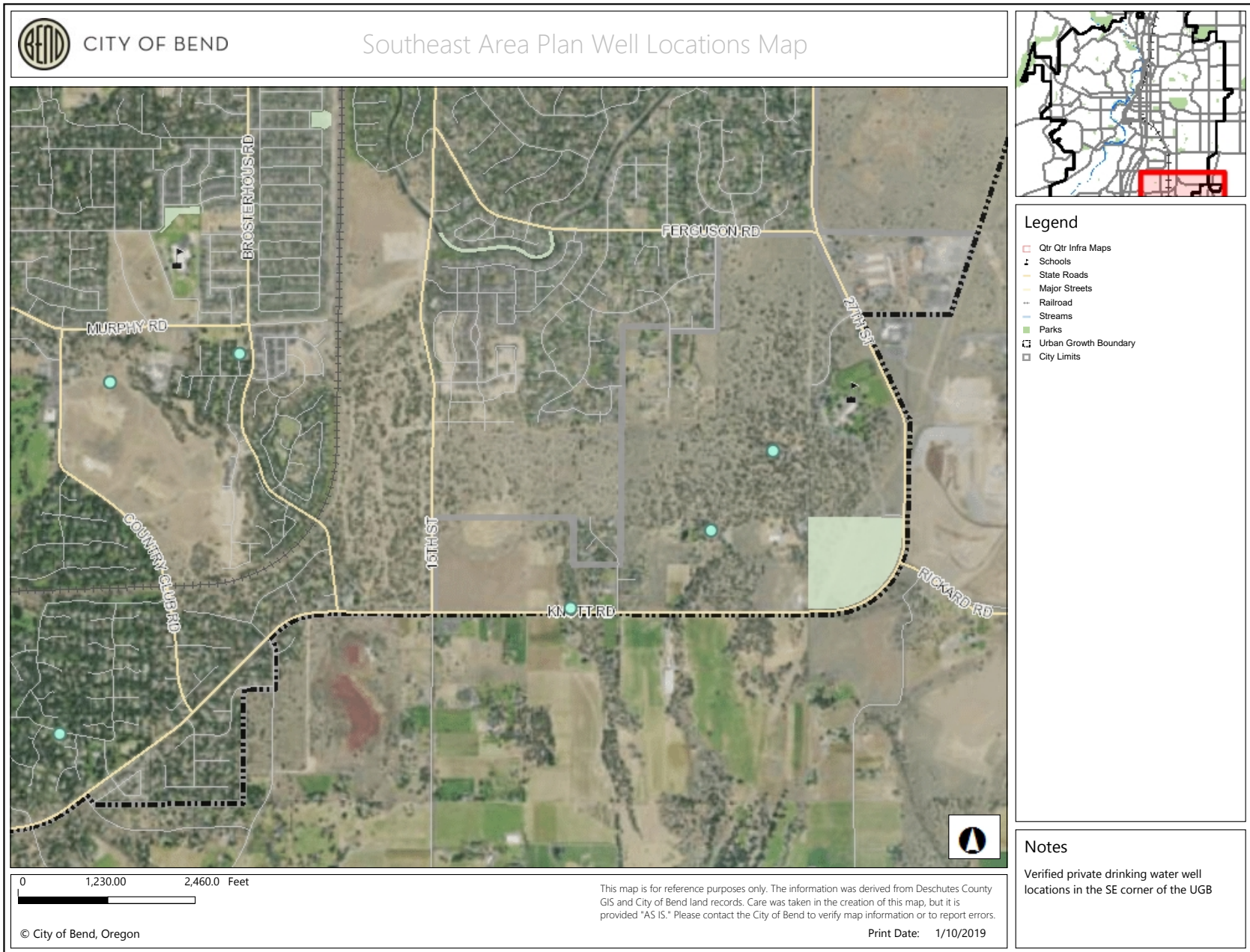


Figure 15. Verified Drinking Well Locations



## STORMWATER

Discussions with City staff have identified a need to determine the lowest point for a future regional stormwater retention pond to serve the area.

## SEWER

An existing sewer collection pipe runs along SE 15th Street adjacent to the study area and is expected to have the capacity to serve the first phases of development in the Southeast Expansion Area.

Projects identified in the 2018 Collection System Public Facilities Plan (CSPFP) to serve the Southeast Expansion Area include :

- Portion of Southeast lift station decommissioning
- Local gravity trunk extension (expected to be built by the School District)
- Local lift station and force main
- East Interceptor Phase 2 (required for buildout growth in southeast Bend; likely a 10+ year project)

The City also recently-completed construction of the Southeast Interceptor (SEI), a multi-purpose infrastructure addition to the City's sewer collection system that provides capacity for future development in southeast Bend.

The City of Bend has an on-call contract with MurraySmith and Associates (MSA) for future sewer modeling, and creation of a sanitary sewer plan to support the SEAP land use designations.



## TRANSCANADA NATURAL GAS PIPELINE

The TransCanada Natural Gas Pipeline is a high-pressure natural gas pipelines that extends between Kingsgate, British Columbia and Malin, Oregon, traversing a distance of 612 miles. A portion of the pipeline extends through the Southeast Expansion Area along an 83.75-foot land easement bisecting the High Desert Park Site. The pipelines that pass through the southeast corner of the Study Area consist of 36-inch and 42-inch diameter pipelines. TransCanada has specific design standards for roadways that cross the easement and TransCanada staff regularly work with engineers and developers on pipeline corridor and crossing agreements to ensure no adverse effects on the pipelines. The 83.75-foot land easement (see Figure 3) is demonstrated but not exact, so surveying prior to development will be required. TransCanada will cover the cost of surveying, with the exception of the cost of acquiring a Hydrovac excavation vehicle, which will be borne by a developer. It will be important to consider the location of the TransCanada pipeline and the design costs of crossing the easement when planning for future roads and development in the area.

## CASCADE NATURAL GAS

Cascade Natural Gas (CNG) holds the role of distributing natural gas to the City of Bend, Cascade Natural Gas has a regulator, odorizing, and gate station located on the Bend Bowmen Club property (see Figure 3) on Knott Road. Their land easement consists of a gated area surrounding these facilities. The CNG easement connects to the TransCanada pipeline and to Knott Road. Existing CNG easements should be protected through the Southeast Area Plan process.



*CNG odorizing facility on Knott Road*



# SOCIAL AND ECONOMIC CONDITIONS

The Southeast Area Plan project area has been developed with a rural residential development pattern that includes several public facilities. The project area includes a total of 21 existing single-family dwellings. There are no multifamily attached or other forms of housing in the project area.

In addition to the dwellings, there are two existing businesses, High Desert Veterinary and Bend Pet Resort. High Desert Veterinary is small animal and equine hospital. The Bend Pet Resort provides pet and dog boarding, along with grooming and training services.

High Desert Middle School is located off of 27th Street and accessed by Diamondback Lane. In addition to the school, the Bend Bowmen, an archer and bow hunting club, have a club house for their events within the expansion area on Knott Road.

With respect to the existing population, the City estimates that around 51 to 52 people live within the project area. This estimate is based on the assumptions of 2.45 persons per household and all residences occupied .