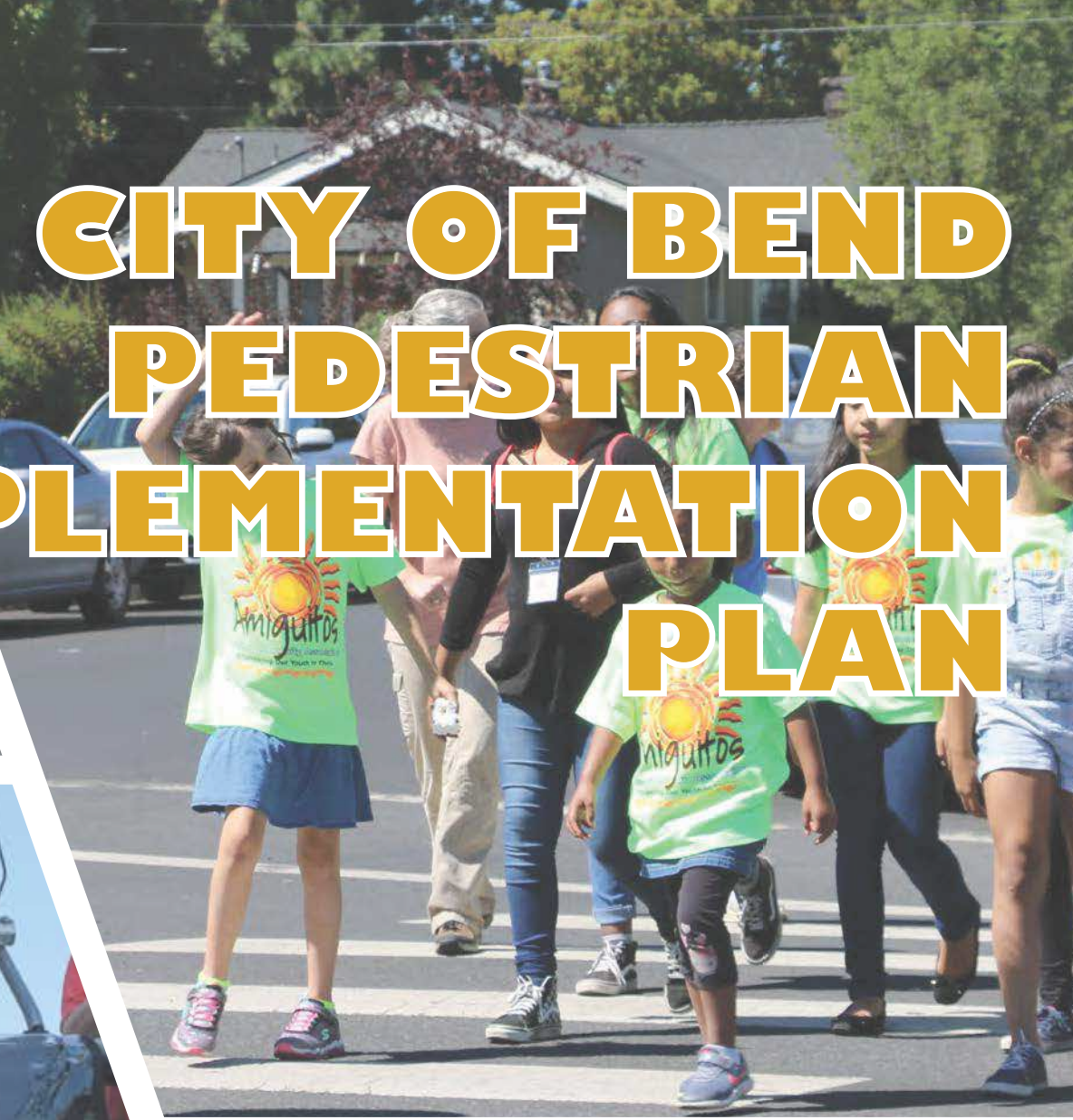


# CITY OF BEND PEDESTRIAN IMPLEMENTATION PLAN



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## Acknowledgements

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# PEDESTRIAN IMPLEMENTATION PLAN

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## Plan Overview

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The City of Bend's Pedestrian Implementation Plan (Plan) establishes a framework for identifying and prioritizing pedestrian infrastructure investment. The Plan is intended to be carried forward as a living tool that City staff can leverage based on funding opportunities and project priorities.

### BACKGROUND

In 2020, the City completed the Transportation System Plan (TSP) Update. The City had access to limited data for walking infrastructure, primarily presence/absence, but little to no data on sidewalk condition. A complete pedestrian infrastructure inventory was beyond the budget and timing constraints for the TSP update – but was recognized as a critical element of the City's transportation planning needs by the advisory committee and Council. In recognition of the importance of a complete, low stress pedestrian network, the TSP included two elements: (1) a system of "Key Routes" to provide cross-city connectivity and (2) a program for a follow-on Pedestrian Implementation Plan.

This phase of the Implementation Plan focusses on areas of the City with the highest pedestrian need, as discussed below, because the City Council made equity a primary goal. This Implementation Plan is the initial step towards the creation of a city-wide, low stress pedestrian network. However, the City recognizes that, although this Implementation Plan will significantly improve the walking environment for transportation disadvantaged populations, other areas in the City will need similar treatment in the future. Therefore, this document provides clear guidance on the steps needed to continue the work.

### DATA DRIVEN APPROACH

The Plan's development relied on a data driven approach for establishing High Pedestrian Need (HPN) Walksheds and Corridors. Emphasis has been placed on prioritizing transportation disadvantaged populations, pedestrian safety, access to key destinations, and safe routes to school.

### LIVING TOOL

The Plan is written as a guidebook and outlines the steps taken by the project team in identifying the City's HPN Walksheds and Corridors. Intended to be carried forward as a "living" tool, the Plan's format communicates the necessary steps required for monitoring and maintaining the Plan as new data, funding, and implementation opportunities become available.

The "living" tool component of the Plan is hosted by the City's Mapping Services group and will be updated as new data becomes available and as projects are completed.

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## Plan Development

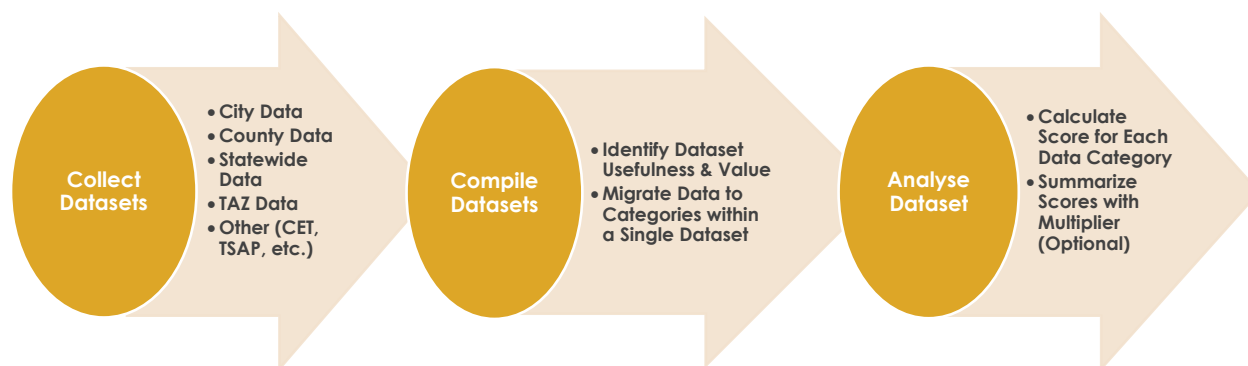
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The following section summarizes the analysis approach and methodology as well as the datasets that have been procured, modified, refined, and applied to identify the locations of HPN Walksheds and Corridors as part of the citywide pedestrian system screening.

## PRIORITIZATION APPROACH & ANALYSIS METHODOLOGY

The prioritization approach and analysis methodology is based on three (3) primary steps, illustrated in Exhibit 1 and described in further detail below. These steps can be revisited or replicated as new data becomes available.

Exhibit 1: Analysis Approach & Methodology Steps



### Step 1: Dataset Collection and Aggregation

First, existing, and available datasets were collected through communication with City of Bend staff, Metropolitan Planning Organization (MPO) staff, review of background material including relevant and recent planning documents, as well as a download of data from the Deschutes County Data Portal. Coordination with recent planning projects, primarily the Cascade East Transit (CET) 2040 Master Plan was also conducted to ensure dataset consistency. All relevant datasets were saved to a single project geodatabase (.gdb). Some datasets with similar pedestrian relevance were aggregated into a single dataset. *For example, the Features of Interest, Places of Interest, Schools, and Library datasets were combined into a single Pedestrian Destination feature class.*

### Step 2: Dataset Compilation

Next, collected and aggregated data was assigned to the street centerline feature class<sup>1</sup>. Point data (i.e., pedestrian destinations) was typically buffered at half- and quarter-mile distances to allow the assignment of attributes to the encompassed street centerline feature segments. Linear data attributes were easier to add directly to the street centerline features since they share the same geometry. Polygonal data, (i.e., TAZ household, employment, and population density) was spatially joined to street centerline. In locations where street centerline features intersected multiple polygons, the average value of the intersecting polygon features was assigned to the street centerline.

### Step 3: Dataset Analysis

Lastly, the values of each data category (i.e., number of lanes, key routes, pedestrian destinations, Safe Routes to School [SRTS], park walksheds, etc.) were normalized based on the highest value identified within each data category.

<sup>1</sup> Street centerline feature includes a comprehensive inventory of sidewalk presence

### **Example Scenario for Pedestrian Destinations:**

Twenty-four (24) pedestrian destinations are the most destinations assigned to all roadway segments analyzed. Therefore, 24 receives the highest value:  $1/24 = 0.0416$  or  $0.416 * 24 = 1$ .

- Segment X has 24 pedestrian destinations and receives a score of "1" ( $0.0416 * 24$ )
- Segment Y has 23 pedestrian destinations and receives a score of "0.958" ( $0.0416 * 23$ )
- Segment Z has 22 pedestrian destinations and receives a score of "0.916" ( $0.0416 * 22$ )

The proportional calculation of attributes relative to one another provides an even "weight" for a given feature class. If the City decides a particular dataset should be prioritized, modifications can be made to the values of the dataset by adjusting the multiplier values assigned to each data category.

## APPLIED, MODIFIED, & REFINED DATASETS

The following datasets were used as part of the citywide pedestrian network screening and ultimate identification of the HPNs Walksheds and Corridors.

### Sidewalk Inventory

Sidewalk Inventory data was obtained from the City of Bend and is based on the 2018 street centerline data. The dataset was produced in 2019 and inventories the presence of existing sidewalks on City streets. For the Pedestrian Network Implementation Plan, this street centerline data (enhanced with sidewalk inventory) serves as the base dataset to migrate all relevant data to, creating the preliminary HPN Walkshed network.

### Transportation Analysis Zones (TAZ) Data

Employment Density, Housing Density, and Population Density data was provided by the City as TAZ polygons. This dataset was considered a proxy to pedestrian travel demand (i.e., where are people walking to, from, and where do people want to walk to, from).

### Transportation Disadvantaged Population Index (TDPI)

The Transportation Disadvantaged Population Index (TDPI) is an index of census data characteristics, designed to help prioritize improvements that serve areas with high numbers of transportation disadvantaged residents and environmental justice communities that have been traditionally underserved. Most recent available American Community Survey (ACS) data at the block group level for the following attributes includes:

- Elderly populations (65 and older)
- Youth populations (under 18)
- Non-white and Hispanic populations
- Limited English proficiency population
- Low-income populations
- Households without access to a vehicle
- People with a disability (severe or non-severe disability)
- Crowded households

This index was calculated according to the ODOT Active Transportation Needs Inventory (ATNI) Assessment. The index converts household statistics from the American Community Survey to a per capita index. It is calculated at the census block group level as the sum of people 65 and older, 17 and younger, non-white or Hispanic, speak English “not well” or “not at all”, low-income, with a disability, living in crowded households, or living in households without vehicle access. That sum is divided by total block population. People fitting into multiple vulnerability categories are counted multiple times. The higher the index number the more disadvantaged the population is with respect to transportation.

#### *Pedestrian Destinations*

Features of Interest, Places of Interest, Schools, Libraries, and Emergency Service Locations data was obtained through the Deschutes County Data Portal. Features of Interest and Places of Interest include, but are not limited to municipal buildings, libraries, parks, schools, stadiums, viewpoints, shopping centers, post offices, etc. These datasets were combined into a single Pedestrian Destination dataset before being assigned to street centerline segments within a quarter mile.

#### *Safe Routes to School*

Safe Routes to School (SRTS) data was provided by the City. The data identified corridors and segments (lines) specific to public schools throughout the City of Bend.

#### *Pedestrian Infill Connectors*

Pedestrian Infill Connector data was provided by the City. The data identifies locations within a 1-mile radius of schools that have existing sidewalk gaps. This data was clipped into quarter-mile, half-mile and beyond half-mile buffer distances from schools and attributed accordingly.

#### *Pedestrian Crossing Connectors*

Pedestrian Crossing Connector data was provided by the City. The data identifies locations within a 1-mile radius of schools that have existing crossing gaps.

For the Pedestrian Network Implementation Plan, this point data (crossing connectors) will be used as an overlay following the analysis run to identify and prioritize locations for crossing improvements.

#### *Transit*

##### *Priority Routes*

Transit Priority Routes from the Cascade East Transit (CET) Master Plan was provided by the CET Project Team. The data identifies existing and planned transit priority routes and transit stops. Transit Priority Routes were overlaid and assigned to the street centerline data with binary “yes” or “no” values.

##### *Transit Facilities*

Existing transit facilities including transit stop locations was provided by CET. Buffer attributes for transit stops within a “quarter mile” and “half-mile” were assigned to the street centerline data.

##### *Mobility hubs*

Generalized mobility hub locations were provided by the City. Street centerline segments that are located within the Mobility Hub polygon dataset were assigned binary values of “yes” or “no”; resulting in a value of 1 or 0 for the summary.

##### *Park Walksheds*

Park Walkshed data was provided by the City. Each year, the Bend Parks and Recreation District completes a walkshed analysis to identify areas that are within half-mile of a park entrance utilizing only local roads. The data is used by the City to help determine where to locate new parks and new safe crossings.

## Transportation Safety Data

### Pedestrian Crashes

The five (5) most recent and available years of crash data (2016-2020) were downloaded from ODOT's Crash Statistics & Reports database. Crashes involving a pedestrian were spatially plotted and assigned to street centerline data based on proximity. Segments with crashes resulting in higher severity of pedestrian injury are prioritized and scored highest. *Note: Only one segment had two pedestrian involved crashes; both Injury C.*

### Pedestrian Risk Factors

NCHRP Research Report 893: Systemic Pedestrian Safety Analysis provides a methodology to address pedestrian safety performance. It describes a systemic approach, as opposed to a "hot spot" approach, to proactively identify sites for potential safety improvements based on specific risk factors for pedestrians.

Several datasets including centerline features contributing to risk factors for pedestrian crashes were provided by the City and downloaded from the County GIS Portal. These centerline features include number of lanes, posted speed, zoning, and sidewalk inventory. As part of the pedestrian risk factor screening, the following features were calculated and assigned to the street centerline as part of the pedestrian risk factor layer.

- Posted speed >30 MPH
- High Destiny Zoning
- Sidewalk on one (1) or zero (0) sides

## Transportation System Plan Data

### Key Routes

Key Route data was obtained from the City and included as part of the TSP dataset. Key Routes were overlaid and assigned to the street centerline data with binary "yes" or "no" values.

# HIGH PEDESTRIAN NEED WALKSHEDS & CORRIDORS

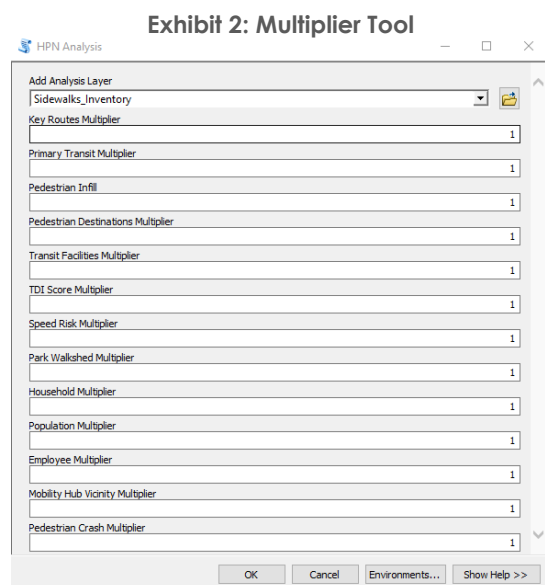
## Step 4: Citywide Pedestrian System Screening

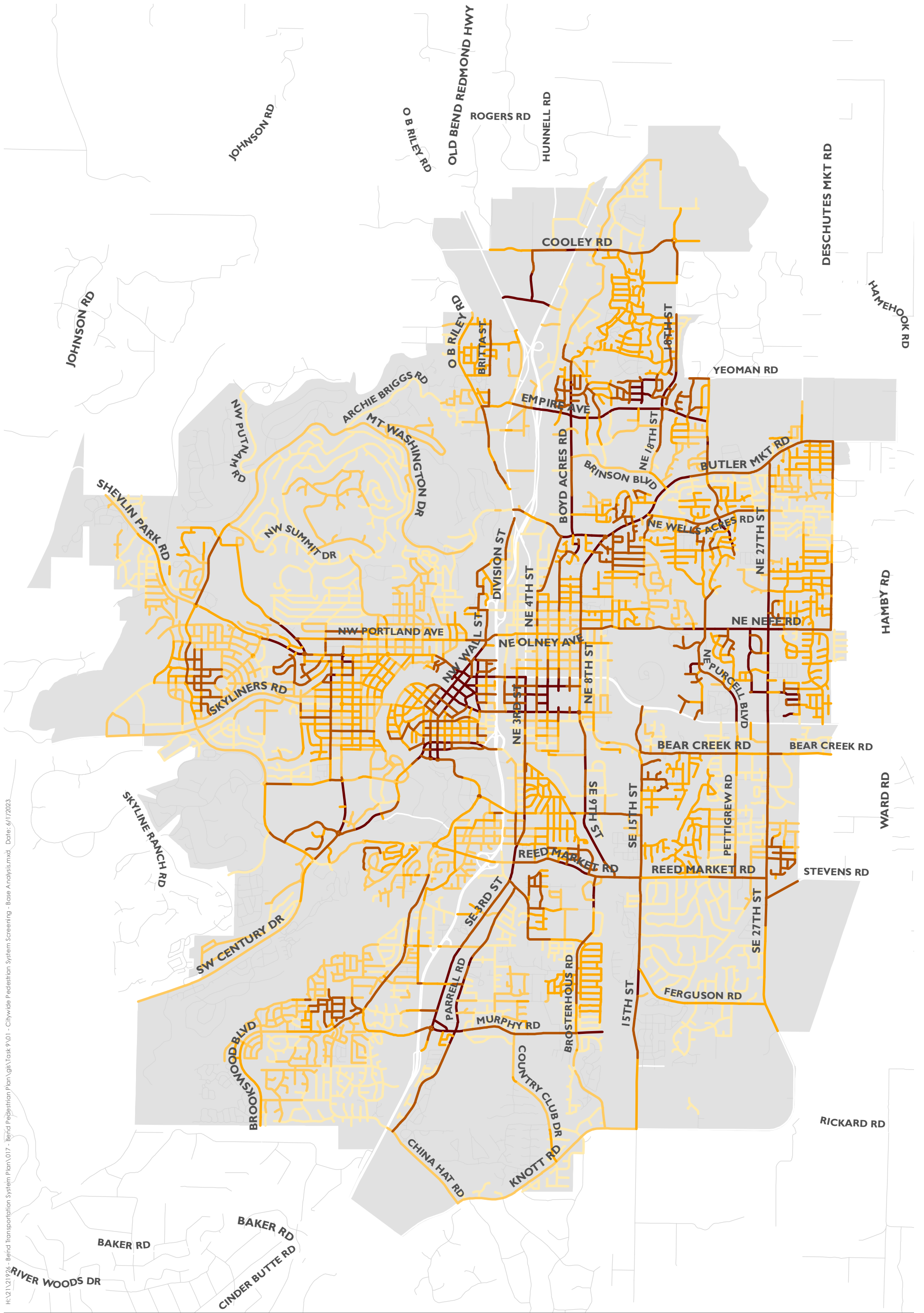
Based on the applied, modified, and refined datasets described in Step 3, the next step was to complete the citywide pedestrian screening analysis to identify the areas of highest pedestrian need.

### MULTIPLIER TOOL

Kittelson developed a multiplier tool to allow for easy scenario testing of various dataset weights. The citywide pedestrian screening analysis is the results of evenly weighted dataset multipliers as shown in Exhibit 2.

Figure 1 illustrates the citywide pedestrian system screening results. The citywide pedestrian system screening is considered the "Base Analysis. Darker lines represent "high" priority locations; lighter lines represent "low" priority.





H:\21\21726 - Bend Transportation System Plan\017 - Bend Pedestrian Plan\Task 9\01 - Citywide Pedestrian System Screening - Base Analysis.mxd Date: 6/17/2023

- Very High Priority
- High Priority
- Medium Priority
- Low Priority
- Very Low Priority
- Urban Growth Boundary



Figure 1

**Citywide Pedestrian System Screening - Base Analysis  
Bend, Oregon**



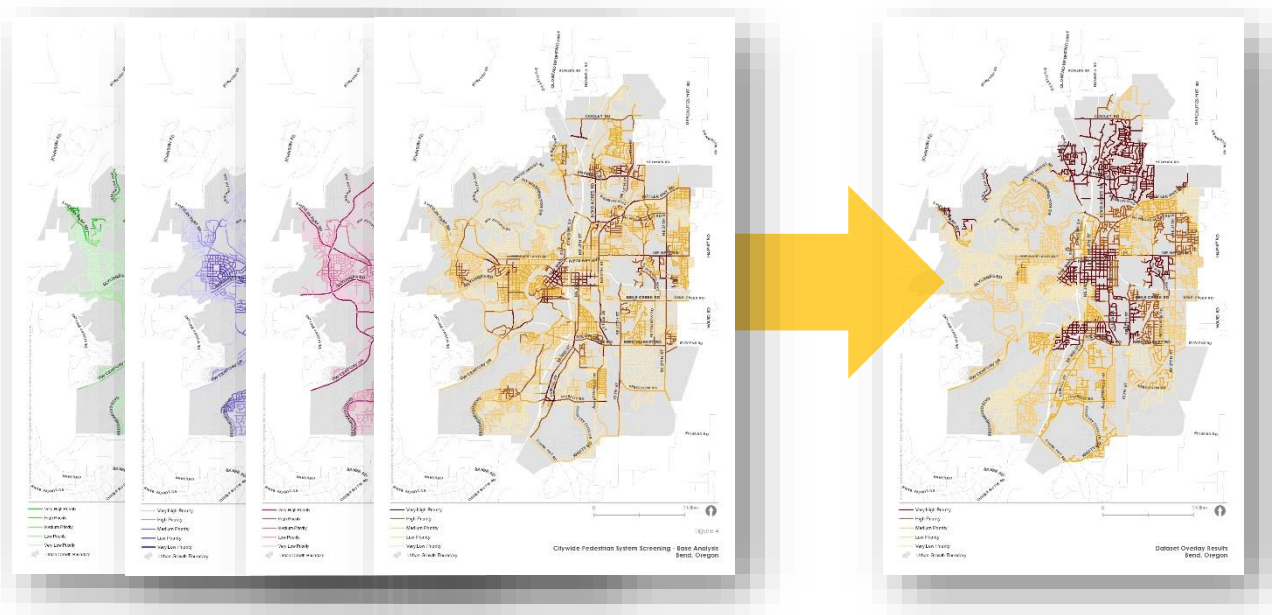
## Step 5: High Pedestrian Need Segment Identification

After the establishment of the citywide pedestrian system screening, the next step was to identify the HPN Walksheds and Corridors.

The HPN's are considered the highest priority segments based on the citywide pedestrian screening results and are equivalent to the Top 40% segment of the citywide pedestrian system screening with an emphasis on the Transportation Disadvantaged Population Index (TDPI), Housing, Employment, and Population (HEP) datasets, and Safety.

To quantitatively emphasize the TDPI, HEP, Safety, and Base Analysis datasets, a data "layering" exercise was performed overlaying the TDPI, HEP, Safety, and Base Analysis as shown in Exhibit 3.

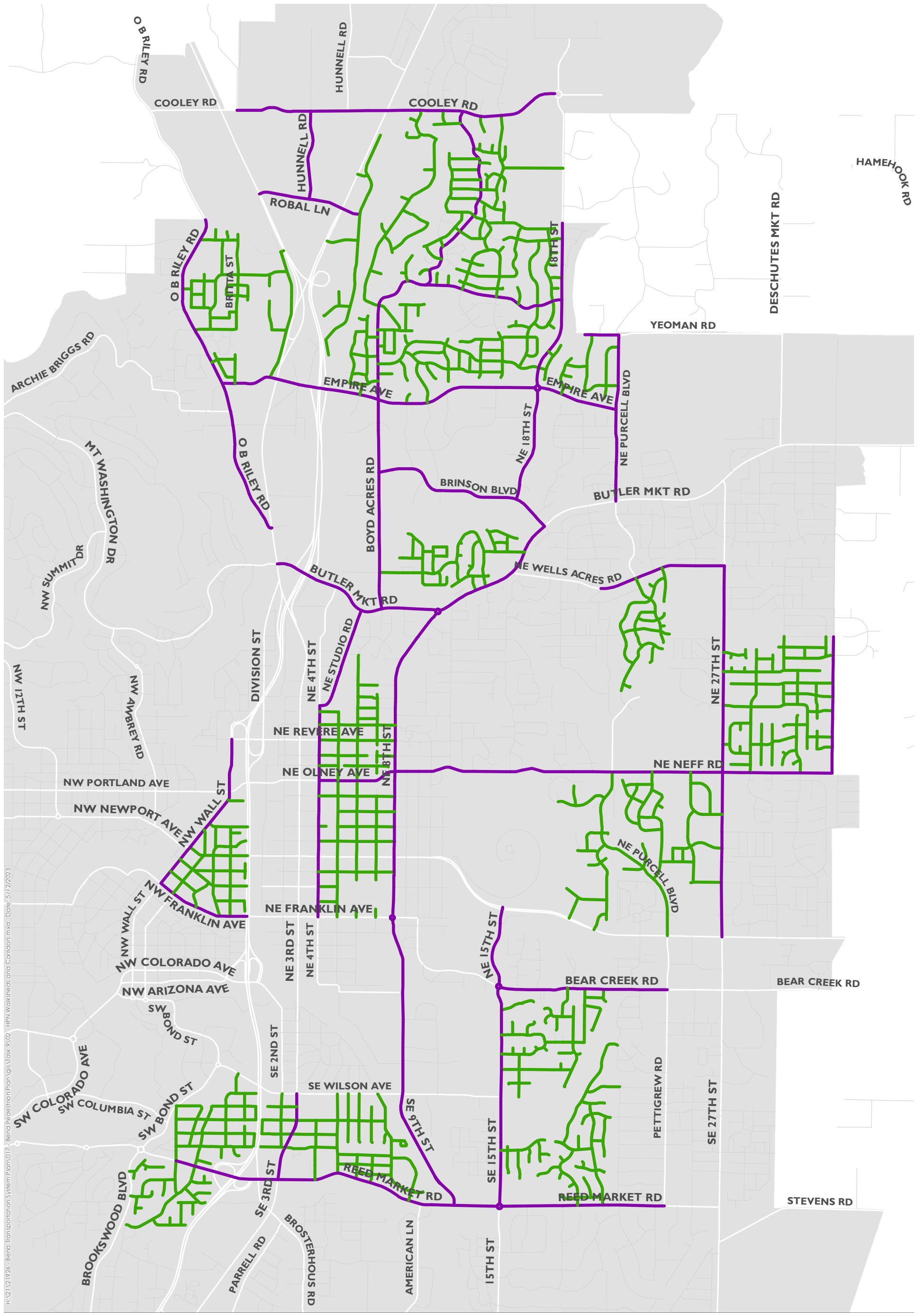
**Exhibit 3: Dataset Overlay: TDPI, HEP, Safety, Base Analysis**



### OPTIONAL DATASET MULTIPLIERS

As a "living" tool moving forward, if the City wishes to prioritize certain datasets, a dataset multiplier can be applied to increase the weight of datasets based on funding opportunities and City priorities. Dataset multipliers can be applied to any of the existing datasets listed in Exhibit 2 or to new datasets as they become available.

Figure 2 illustrates the HPN Walksheds and Corridors.



- Corridors
- Walksheds
- Urban Growth Boundary

Figure 2  
**High Pedestrian Need Walksheds & Corridors  
 Bend, Oregon**

## Step 6: High Pedestrian Need Facility Inventory

### SIDEWALK INVENTORY

The next step was to understand the facility needs of the HPN Walkshed and Corridor network. The sidewalk inventory dataset was overlaid onto the HPN network to understand where sidewalks exist today (one or both sides) and where sidewalk gaps are located (one or both sides) on the HPN network.

For locations with sidewalk gaps (one or both sides), projects were identified to fill the gaps. For locations with existing sidewalks (one or both sides), detailed data collection inventory was performed.

#### pathVu Technologies

PathVu is a data collection technology used to obtain detailed sidewalk attributes data including:

- Path type
- Obstruction type
- Surface type
- Roughness
- Level change
- Width
- Running slope
- Cross slope

Based on these attributes, PathVu creates a "Route Accessibility Index (RAI)" score. The RAI is a relative score given to a particular segment based on the Segment RAI. The range is from 0-100, with 100 being in excellent condition. Photos are also taken every 10 feet as part of data collection.



PathVu data collection was performed on HPN segments with existing sidewalks. This included over 160 miles of linear sidewalk. Once the data was collected, pathVu processed the data and returned the dataset to the project team in GIS.

## CROSSING INVENTORY

Similar to HPN segments, crossing locations on the HPN network were identified and evaluated to understand facility needs. Intersection control types i.e., existing signalized, unsignalized, enhanced crossings (RRFB, median, etc.) all-way stop control (AWSC), etc. were identified at intersection where **more than one** HPN segment intersects.

## Step 7: Prioritized Project List of High Pedestrian Needs

The last step in the Plan process was to develop the prioritized project list of HPNs. The list of prioritized projects primarily focuses on two project types:

- Segments – Sidewalk infill (pedestrian network gaps), and sidewalk improvements
- Crossings – Enhanced crossing opportunities linking high priority walkshed areas

## SEGMENTS

The prioritized list of segment projects was developed utilizing the results of the HPN Walkshed & Corridors analysis described in Step 5 as well as the sidewalk inventory and pathVu datasets. Segment needs were prioritized based on the following tiers:

- Tier 1 = HPN (Top 40% - highest of priorities) + No sidewalk either side + pathVu poor sidewalk condition within close proximity
- Tier 2 = HPN (all) + No sidewalk either side + pathVu poor sidewalk condition within close proximity
- Tier 3 = HPN (Top 40% - highest of priorities) + Sidewalk on one side only

Figure 3 illustrates the prioritized segments projects and Table 1 provides additional detail on project ID, segment name, extents, priority, description, and funding considerations.

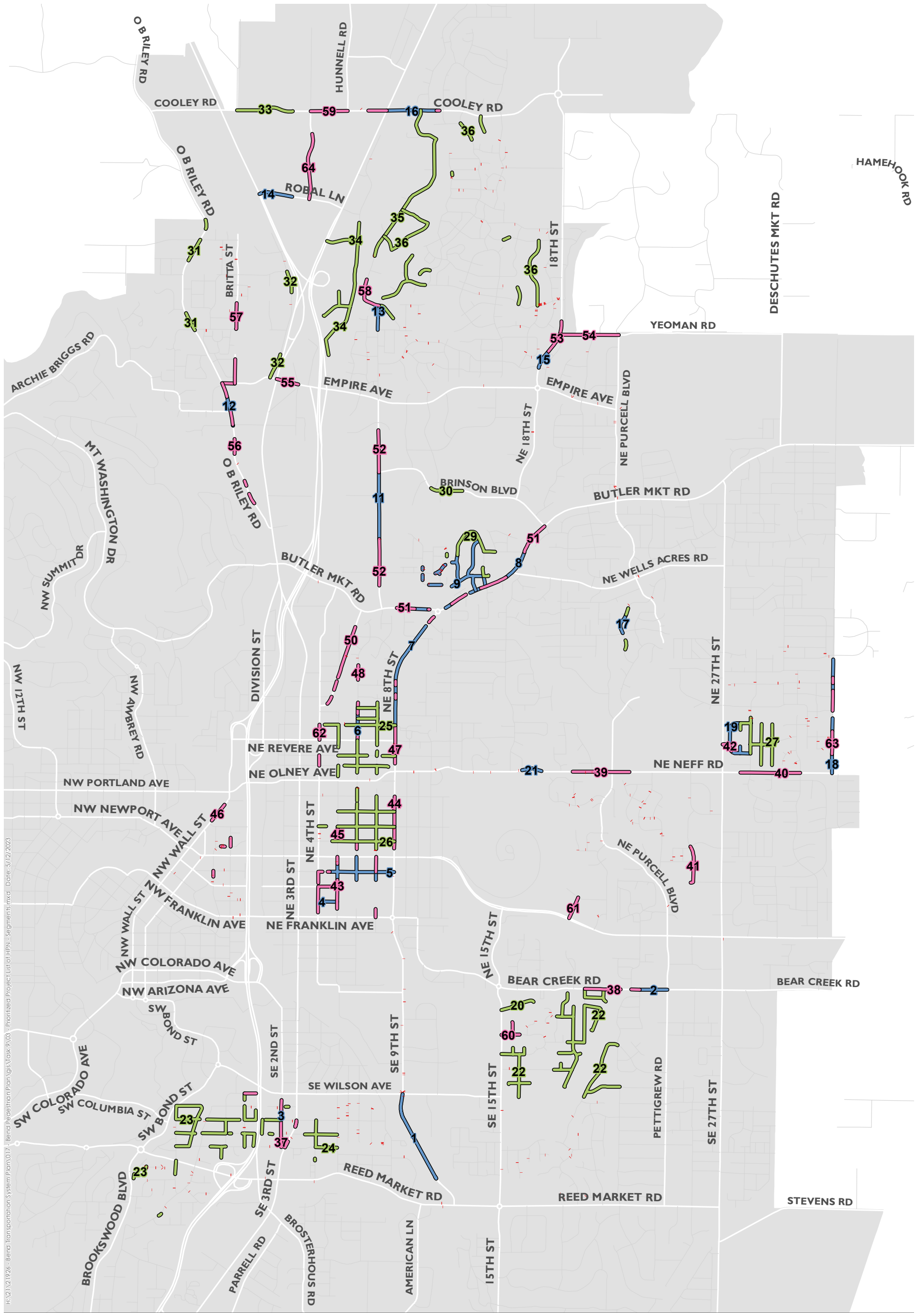
## CROSSINGS

The prioritized list of crossing projects was developed utilizing the results of the HPN Walkshed & Corridors analysis, Safe Routes to School (SRTS) Connector/Key Crossings, Transportation System Plan (TSP) Key Routes, and posted speed >30mph datasets. Identification of the prioritized list of crossing projects focuses on unsignalized locations. Crossing needs were prioritized based on the following tiers:

- Tier 1 = Unsignalized Intersections + SRTS Connector/Key Crossings **and** TSP Key Routes
- Tier 2 = Unsignalized Intersections + SRTS Connector/Key Crossings **or** TSP Key Routes
- Tier 3 = Unsignalized Intersections

Based on the approaches outlined above, the segment and crossing project list was reviewed by the project team and city staff to confirm accuracy. Projects that have been completed since the sidewalk inventory dataset was created were removed, and projects that are planned and funding were maintained with notes added recognizing planned implementation.

Figure 4 illustrates the prioritized crossing projects and Table 2 provides additional detail on project ID, crossing name, extents, priority, description, and funding considerations.



- Poor Sidewalk Condition (pathVu)
- Tier 1 - Sidewalk Gaps + Improvements
- Tier 2 - Sidewalk Gaps + Improvements
- Tier 3 - Sidewalk Gaps + Improvements
- Urban Growth Boundary



Figure 3

**Prioritized Project List of High Pedestrian Needs - Segments  
Bend, Oregon**

## PRIORITIZED PROJECT LIST OF HIGH PEDESTRIAN NEEDS – SEGMENTS

**Table 1: Segments identified for Sidewalk Infill & Improvements**

ID	Segment Name	From	To	Priority	Description	Funding
1	SE 9 <sup>th</sup> Street	215' south of SE Woodland Blvd	785' north of Red Market Road	Tier 1	Improve sidewalk conditions and fill sidewalk gaps.	Key Route. To be completed with Greenways Phase 4.
2	Bear Creek Rd	Rawhide Dr	Pettigrew Rd/NE Purcell Blvd	Tier 1	Fill sidewalk gaps.	Key Route. To be completed with the Bear Creek/27 <sup>th</sup> -Improvement project
3	SE 2 <sup>nd</sup> St	88' south of SE Taft Ave	SE Roosevelt Ave	Tier 1	Fill sidewalk gaps.	Key Route.
4	NE Greeley Ave	NE 4 <sup>th</sup> St	NE 5 <sup>th</sup> St	Tier 1	Fill sidewalk gaps.	<Null>
5	Juniper Park Neighborhood Access	See map – NE Irving Ave, NE 5 <sup>th</sup> , NE 6 <sup>th</sup> , NE 7 <sup>th</sup>		Tier 1	Fill sidewalk gaps.	Key Route – Partial.
6	NE 6 <sup>th</sup> St	144' south of NE Innes Ln	110' north of NE Revere Ave	Tier 1	Fill sidewalk gaps.	Key Route.
7	NE 8 <sup>th</sup> St	NE Isabella Ln	NE Seward Ave	Tier 1	Fill sidewalk gaps.	<Null>
		95' north of NE Isabella Ln	123' south of Bennington Way			
8	Butler Market Rd	257' east of NE Ravenwood Dr	187' west of NE 8 <sup>th</sup> St	Tier 1	Fill sidewalk gaps	Key Route. To be completed with Butler/Boyd Project.
		152' east of NE 8 <sup>th</sup> St	NE Jones Rd			
		115' east of NE Milltown Ln	132' west NE Sandy Dr			
		137' east of Huettl Ln	NE Rungay Ln			
9	Orchard District Neighborhood	See map – North of Butler Market Road, south of canal, east of Boyd Acres		Tier 1	Fill neighborhood sidewalk gaps	<Null>

ID	Segment Name	From	To	Priority	Description	Funding
10	Orchard District Neighborhood	See map – North of Butler Market Road, south of canal, east of Boyd Acres		Tier 1	Improve sidewalk conditions.	<Null>
11	Boyd Acres Rd	Brinson Blvd	803' north of NE Ross Rd	Tier 1	Fill sidewalk gaps.	Key Route. To be completed with Butler/Boyd Project.
12	O.B. Riley Rd	360' north of Archie Briggs Rd	Archie Briggs Rd	Tier 1	Fill sidewalk gaps.	Key Route.
		NW Mervin Samples Rd	NW Sawyer Reach Ln			
13	Boyd Acres Rd	Vogt Rd/Fred Meyer Rd	Town Dr	Tier 1	Fill sidewalk gaps.	Key Route.
14	Robal Ln	US20	419' west of Hunnell Rd	Tier 1	Fill sidewalk gaps.	Possibility to be completed through North Corridor Project. System development charge (SDC)
15	18 <sup>th</sup> St	NE Sierra Dr	NE Primo Pl	Tier 1	Fill sidewalk gaps.	<Null>
16	Cooley Rd	US97	158' west of NE Stacy Ln	Tier 1	Fill sidewalk gaps.	Key Route – Partial. Possibility to be completed through North Corridor Project.
17	NE Ocker Dr	NE Jackson Ave	NE Hall Cir	Tier 1	Fill neighborhood sidewalk gaps.	<Null>
18	Eagle Rd	183' south of NE Zone Ave	132' north of Angela Ave	Tier 1	Fill sidewalk gaps.	<Null>
19	NE Wichita Wy	NE Tucson Wy (south)	NE Tombstone Wy	Tier 1	Fill neighborhood sidewalk gaps.	<Null>
20	SE Ramsay Rd	SE 15 <sup>th</sup> St	Eastern extents	Tier 2	Fill neighborhood sidewalk gaps.	Due to limited connectivity associated with the cul-de-sac nature of SE Ramsay Rd, this project was reduced from a Tier 1 to a Tier 2 priority.
21	NE Neff Rd	NE Eastwood Dr	472' east of NE Eastwood Dr	Tier 1	Fill sidewalk gaps.	Key Route. To be completed with Neff/Purcell Project.

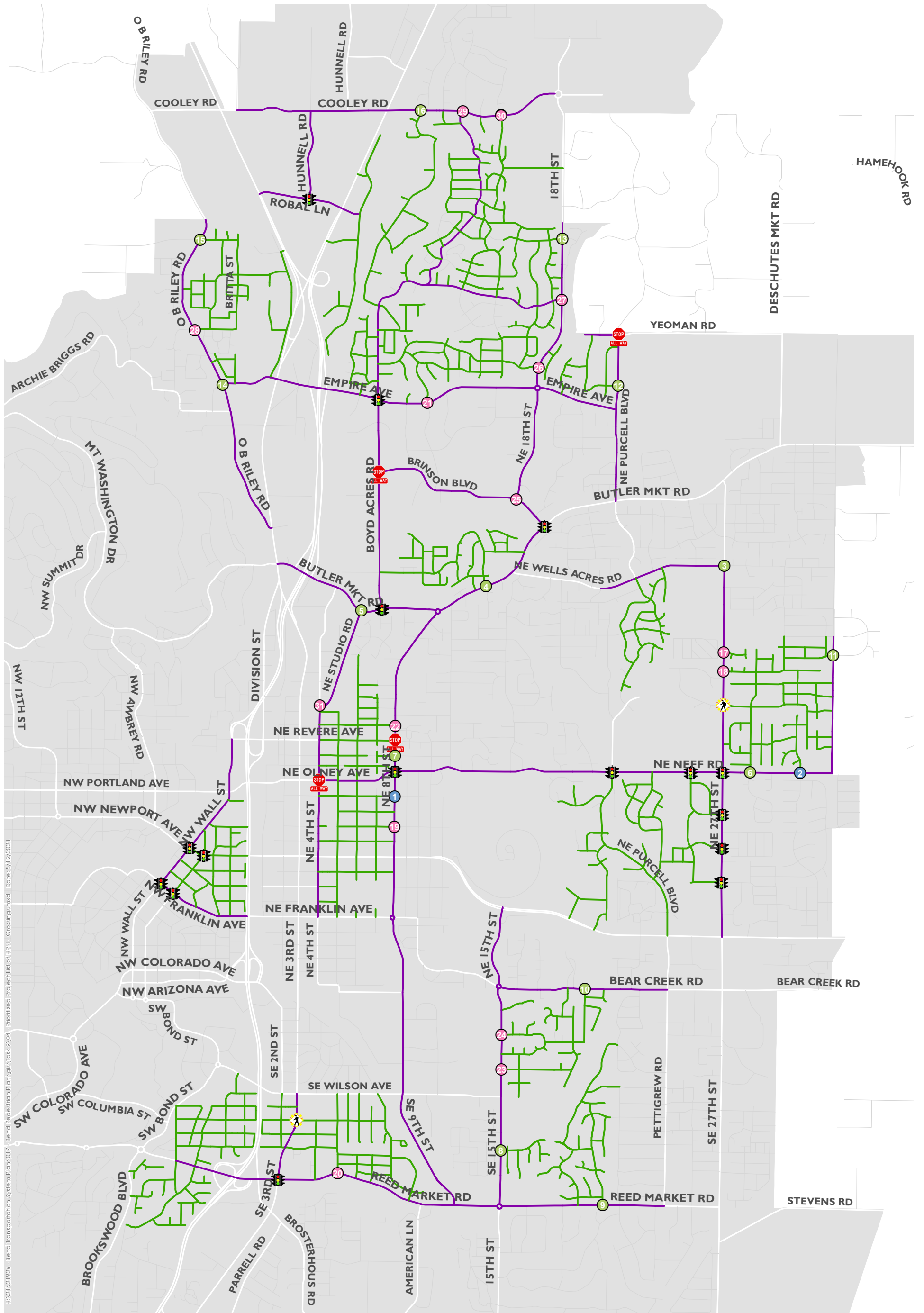
ID	Segment Name	From	To	Priority	Description	Funding
22	Larkspur Neighborhood	See map – South of Bear Creek Rd, east of SE 15 <sup>th</sup> St, west of Pettigrew Rd		Tier 2	Fill neighborhood sidewalk gaps.	<Null>
23	Southern Crossing Neighborhood	See map – East of SW Bond St, south of SE Wilson Ave, west of US97, north of Reed Market Rd		Tier 2	Fill neighborhood sidewalk gaps.	Key Route – Partial. Portions south of Reed Mkt to be completed with Neighborhood Street Safety Program (NSSP) 2024
24	Larkspur Neighborhood	See map – East of US97, south of SE Wilson Ave, SE 5 <sup>th</sup> St, north of Reed Market Rd		Tier 2	Fill neighborhood sidewalk gaps.	<Null>
25	Orchard District (north)	See map – South of NE Isabella Ln, east of NE 4 <sup>th</sup> St, west of NE 8 <sup>th</sup> St, north of NE Olney Ave/NE Penn Ave		Tier 2	Fill neighborhood sidewalk gaps.	Key Route – Partial.
26	Orchard District (south)	See map – South of NE Olney Ave/NE Penn Ave, east of NE 4 <sup>th</sup> St, west of NE 8 <sup>th</sup> St, north of NE Greenwood Ave		Tier 2	Fill neighborhood sidewalk gaps.	Key Route – Partial.
27	Mountain View Neighborhood	See map – East of NE 27 <sup>th</sup> St, north of NE Neff Rd, west of NE providence Dr, south of NE Conners Ave. <b>Bundle with Segment ID 18</b>		Tier 2	Fill neighborhood sidewalk gaps.	<Null>
28	NE Ocker Dr	158' north of NE Hall Cr	75' south of NE Barnett Ct	Tier 2	Fill neighborhood sidewalk gaps. <b>Bundle with Segment ID 17.</b>	<Null>
29	Orchard District Neighborhood	See map – North of Butler Market Rd, south of canal, east of Boyd Acres. <b>Bundle with Segment ID 9</b>		Tier 2	Fill neighborhood sidewalk gaps.	<Null>
30	Brinson Blvd	91' west of Layton Ave	Mercury Pl	Tier 2	Fill sidewalk gaps	<Null>
		270' east of Mercury Pl	31' east of Mercury Pl			
31	O.B. Riley Rd	Hardy Rd	Roper Ln	Tier 2	Fill sidewalk gaps	<Null>
32	Jamison St	Poe Shoes Dr	509' south of Poe Shoes Dr	Tier 2	Fill sidewalk gaps	<Null>
		607' north of Empire Ave	Empire Ave			



ID	Segment Name	From	To	Priority	Description	Funding
33	Cooley Rd	Scenic Dr	434' west of Hunnel Rd	Tier 2	Fill sidewalk gaps.	Possibility to be completed through North Corridor Project. System development charge (SDC).
34	Nels Anderson Rd	See map – Nels Anderson Rd, Nels Anderson Pl, Brandis Ct, and Lyman Pl 203' south of Robel Ln		Tier 2	Fill sidewalk gaps.	System development charge (SDC).
35	Hunters Cir/Vogt Rd	Cooley Rd	365' north of Independence Wy	Tier 2	Fill sidewalk gaps.	Key Route.
36	Boyd Acres Neighborhood	See map – North of Empire Ave, south of Cooley Rd, West of 18 <sup>th</sup> St, east of Vogt Rd		Tier 2	Fill neighborhood sidewalk gaps.	<Null>
37	Larkspur Neighborhood	See map – North of Reed Market Interchange, south of Wilson Ave, west of SE 4 <sup>th</sup> St, east of SW Hill St		Tier 3	Fill sidewalk gaps (on one side).	Key Route – Partial.
38	Bear Creek Rd	Cessna Dr	Raw Hide Dr	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 2 and Crossing ID 10.</b>	Key Route. To be completed with Bear Creek/27 <sup>th</sup> .
39	NE Neff Rd	283' east of NE Leehaven Lane	415' east of NE Purcell Blvd	Tier 3	Fill sidewalk gaps (on one side).	Key Route. To be completed with Neff/Purcell Project.
40	NE Neff Rd	236' west of NE Tucson Way	NE Providence Dr	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Crossing ID 2 and 6.</b>	Key Route. To be completed with Neff/Purcell Project.
41	NE Watt Wy	NE Mary Rose Pl	Forum Dr	Tier 3	Fill sidewalk gaps (on one side).	Key Route.
42	NE Wichita Wy	NE 27 <sup>th</sup> St	186' south of NE Wichita Way	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 19.</b>	<Null>
43	Juniper Park Side Street Access	See map – NE 4 <sup>th</sup> St, NE 5 <sup>th</sup> St, NE 7 <sup>th</sup> St		Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 4 and 5.</b>	<Null>
44	NE 8 <sup>th</sup> Str	NE Norton Ave	202' north of NE Franklin Ave	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Crossing ID 1 and 19.</b>	<Null>

ID	Segment Name	From	To	Priority	Description	Funding
45	Orchard District	See map – NE 5 <sup>th</sup> St, NE 6 <sup>th</sup> St		Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 26.</b>	Key Route – Partial.
46	Downtown (Old Town)	See map – NW Wall St, NW Herman St, NW Kearney Ave, NW Hill St		Tier 3	Fill sidewalk gaps (on one side) and sidewalk improvements.	Key Route – Partial.
47	NE 8 <sup>th</sup> St	NE Seward Ave	187' north of on NE Penn Ave	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Crossing ID 7 and 22.</b>	<Null>
48	NE 6 <sup>th</sup> St	NE Revere Ave	247' south of NE Stalker Ct	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 6.</b>	Key Route.
49	NE 8 <sup>th</sup> St	Butler Market Rd	NE Isabella Ln	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 7.</b>	<Null>
50	NE Studio Rd	NE 4 <sup>th</sup> St	Butler Market Rd	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Crossing ID 5 and 31.</b>	<Null>
51	Butler Market Rd	Boyd Acres Rd	Brinson Blvd	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 8 and Crossing ID 4.</b>	Key Route. To be completed with Butler/Boyd Project.
52	Boyd Acres Rd	Empire Ave	Butler Market Rd	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 11.</b>	Key Route. To be completed with Butler/Boyd Project.
53	18 <sup>th</sup> St	524' south of Morning Star Dr	460' north of NE Sierra Dr	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 15 and Crossing ID 26 and 27.</b>	Key Route – Partial. To be completed through Pahlisch Homes as part of the Petrosa development.
54	Yeoman Rd	NE 18 <sup>th</sup> St	NE Purcell Blvd	Tier 3	Fill sidewalk gaps (on one side). Improve accessibility and access over canal.	Key Route.

ID	Segment Name	From	To	Priority	Description	Funding
55	Empire Ave	US20	O.B. Riley Rd	Tier 3	Fill sidewalk gaps (on one side).	<Null>
56	O.B. Riley Rd	Empire Ave	730 north of US20	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 12 and Crossing ID 14.</b>	Key Route.
57	Britta St	Empire Ave	209' north of Mariner Dr	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 55 and Crossing ID 14.</b>	Key Route.
58	Vogt Rd	Independence Wy	Boyd Acres Rd	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 13.</b>	Key Route.
59	Cooley Rd	Hunnell Rd	High Standard Dr	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 16 and Crossing ID 16.</b>	Possibility to be completed through North Corridor Project.
60	SE Virginia Rd/SE 16 <sup>th</sup> St	SE 15 <sup>th</sup> St	178' west of Winddance Crt	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 20 and Crossing ID 24.</b>	<Null>
61	NE Arbett Wy	US 20	NE Linnea Dr	Tier 3	Fill sidewalk gaps (on one side).	<Null>
62	NE 4 <sup>th</sup> St	NE Seward Ave	NE Penn Ave	Tier 3	Fill sidewalk gaps (on one side).	<Null>
63	Eagle Rd	164' south of NE Monte Vista La	140' north of NE Red Oak Dr	Tier 3	Fill sidewalk gaps (on one side). <b>Bundle with Segment ID 18.</b>	<Null>
64	Hunnell Rd	Robal Ln	550' south of Cooley Rd	Tier 3	Fill sidewalk gaps (on one side).	<Null>



H:\211\21926 - Bend Transportation System Plan\017 - Bend Pedestrian Plan\GIS\Task 9\04 - Prioritized Project List of HPN - Crossings.mxd Date: 5/12/2023

- Tier I Crossing
- Tier II Crossing
- Tier III Crossing
- Corridors
- Walksheds
- + Urban Growth Boundary
- All Way Stop Control
- Enhanced Crossing
- Signalized



Figure 4  
**Prioritized Project List of High Pedestrian Needs - Crossings  
 Bend, Oregon**

## PRIORITIZED PROJECT LIST OF HIGH PEDESTRIAN NEEDS – CROSSINGS

**Table 2: Crossing Locations identified for Enhancement**

ID	Intersection	Priority	Greater than 30MPH	SRTS/ Key Crossing	TSP Key Route	Notes/Considerations
1	NE 8 <sup>th</sup> St/NE Norton Ave	Tier 1	Yes	Yes	Yes	Enhanced crossing installed, consider addition of median.
2	NE Neff Rd/NE Providence Dr	Tier 1	Yes	Yes	Yes	
3	NE 27 <sup>th</sup> St/NE Wells Acres Rod	Tier 2	Yes	Yes	No	Consider Tier I, future roundabout intersection?
4	Butler Market Rd/NE Sandy Dr	Tier 2	Yes	No	Yes	
5	Butler Market Rd/NE Studio Rd	Tier 2	Yes	No	Yes	Consider median, challenging curvature.
6	NE Neff Rd/NE Tucson Way	Tier 2	Yes	No	Yes	
7	NE 8 <sup>th</sup> St/NE Quimby Ave	Tier 2	Yes	Yes	No	Sidewalk infill on east side of 8 <sup>th</sup> between Revere and Olney needed. Consider lowering priority of crossing need if roundabout is constructed at Revere Ave with improved crossing.
8	SE 15 <sup>th</sup> St/SE Bronzewood Ave	Tier 2	Yes	Yes	No	SE Bronzewood planned to punch through, enhanced crossing planned as well?
9	Reed Market Rd/SE Shadowood Dr	Tier 2	Yes	Yes	No	Further enhancement need identified, consider tradeoffs of enhanced location with Fargo Ln to the east.
10	Bear Creek Rd/Cessna Dr	Tier 2	Yes	No	Yes	
11	Eagle Rd/Starling Dr	Tier 2	Yes	Yes	No	
12	NE Purcell Blvd/Rock Park Dr	Tier 2	Yes	No	Yes	Consider additional enhancement.

ID	Intersection	Priority	Greater than 30MPH	SRTS/ Key Crossing	TSP Key Route	Notes/Considerations
13	18 <sup>th</sup> St/Rorick Dr/Canal View Dr	Tier 2	Yes	Yes	No	Consider Tier 1, enhanced crossing needed.
14	O.B. Riley Rd/Empire Ave	Tier 2	Yes	No	Yes	Consider Tier 1. Planning intersection improvements associated with Go Bond.
15	O.B. Riley Rd/Glen Vista Rd/Hardy Rd	Tier 2	Yes	Yes	No	Consider Tier 1, larger intersection reconfiguration project
16	Cooley Rd/Hunters Cir	Tier 2	Yes	No	Yes	Sidewalk infill need identified to support full key route connection across Cooley.
17	NE 27 <sup>th</sup> St/NE Rosemary Dr	Tier 3	Yes	No	No	Need for enhanced crossing identified, consider tradeoffs of enhanced location with Yellow Ribbon Dr to the south.
18	NE 27 <sup>th</sup> Street/NE Yellow Ribbon Dr	Tier 3	Yes	No	No	Need for enhanced crossing identified, consider tradeoffs of enhanced location with NE Rosemary Dr to the north.
19	NE 8 <sup>th</sup> St/NE Lafayette Ave	Tier 3	Yes	No	No	Need for enhanced crossing identified.
20	Reed Market Rd/SE 5 <sup>th</sup> St	Tier 3	Yes	No	No	Need for enhanced crossing identified, challenging curvature.
21	Empire Ave/Layton Ave	Tier 3	Yes	No	No	Need for enhanced crossing identified, challenging curvature.
22	NE 8 <sup>th</sup> St/NE Seward Ave	Tier 3	Yes	No	No	Need for enhanced crossing identified.
23	SE 15 <sup>th</sup> St/SE Tempest Dr	Tier 3	Yes	No	No	Consider additional enhancement.
24	SE 15 <sup>th</sup> St/SE Virginia Rd	Tier 3	Yes	No	No	Consider additional enhancement.
25	Brinson Blvd/NE 18 <sup>th</sup> St	Tier 3	Yes	No	No	Need for enhanced crossing identified, challenging curvature.
26	NE 18 <sup>th</sup> St/NE Sierra Dr	Tier 3	Yes	No	No	Need for enhanced crossing identified.

ID	Intersection	Priority	Greater than 30MPH	SRTS/ Key Crossing	TSP Key Route	Notes/Considerations
27	NE 18 <sup>th</sup> St/Morning Star Dr	Tier 3	Yes	No	No	Need for enhanced crossing identified.
28	O.B. Riley Rd/Halfway Rd/Riverstone Rd	Tier 3	Yes	No	No	Need for enhanced crossing identified.
29	Cooley Road/Boyd Acres Rd	Tier 3	Yes	No	No	Need for enhanced crossing identified.
30	Cooley Road/Ranch Village Dr	Tier 3	Yes	No	No	Need for enhanced crossing identified. Existing enhanced crossing located approximately 275' east. Consider proximity of existing enhanced crossing to evaluate need of additional.
31	NE 4 <sup>th</sup> St/NE studio Rd	Tier 3	Yes	No	No	Need for enhanced crossing identified.

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## Project Prospectus Sheets

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Ten project prospectus sheets were developed for high priority projects. The prospectus sheets are intended to advance project understanding by providing additional context on project considerations, needs, descriptions, funding sources, pedestrian curb ramp requirements, and planning level cost estimates. The project prospectus sheets also include concept level sketches illustrating the proposed improvements.

The project prospectus sheets are included in Appendix A.

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## Guidelines for Continued City Inventory

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As described previously, the HPN Walksheds and Corridors identified in Step 5 and illustrated in Figure 2 account for only the top 40% of the initial screening of the City's pedestrian system. The City recognizes that there is additional work to be done to build a fully functional low stress pedestrian system throughout Bend.

Going forward, the City may utilize the process outlined in this Plan to:

- Conduct additional pedestrian facility inventory for the remaining 60% of the pedestrian network utilizing pathVu or a similar data collection outfit.
- Inventory the pedestrian infrastructure and identify needs in the Climate Friendly Areas required by the State's now Climate Friendly and Equitable Communities rules.
- Periodically revisit Step 1 through Step 7 to identify new HPN locations as projects are completed and/or new data becomes available.



Appendix A  
Project Prospectus Sheets

# 1: NE Neff Road Improvements: Segment ID 40 | Crossing ID 2 and 6



<b>From:</b>	200' west of NE Tucson Way	<b>To:</b>	NE Providence Drive
<b>Project Type:</b>	Sidewalk infill (gap one side); Enhanced crossing(s)		
<b>Length:</b>	0.27 Miles (1,425 feet)	<b>Planning Level Cost Estimate:</b>	\$1,160,000
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on the north side of the roadway between 200' west of NE Tucson Way and NE Providence Drive.</li> <li>▶ Install an enhanced pedestrian crossing at NE Neff Road/NE Providence and NE Neff Road/NE Tucson Way.</li> <li>▶ Upgrade pedestrian ramps at intersections where improvements are proposed or determined necessary (22).</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ Identified on Key Route</li> <li>▶ No marked pedestrian crossings are provided today; the closest marked crossing is located at the Neff Road/NE 27<sup>th</sup> intersection.</li> <li>▶ Transit stops are located along NE 27<sup>th</sup> Rd, west of the project extents.</li> <li>▶ Adjacent land use predominantly consists of single-family housing with parks and recreation spaces.</li> <li>▶ Opportunity to utilize landscape buffers to increase separation.</li> <li>▶ Sidewalk installation may require relocation of speed limit sign located ~ 300' east of Neff Road/NE Tucson Way intersection.</li> <li>▶ GO Bond project identified that may address this segment with shared-use path.</li> </ul>		
<b>Potential Funding Sources</b>	<p>State: Safe Routes to School (SRTS), Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program.</p> <p>City: COVID Relief funds, general transportation grant funding.</p> <p>MPO: Carbon Reduction Program Funding.</p>		

# 1: NE Neff Road Improvements: Graphic Rendering & Concept Illustration

The following images illustrate a concept design for the recommended improvements described above.



NE NEFF RD /  
NE TUCSON AVE

NE NEFF RD /  
NE PROVIDENCE DR



LEGEND	Proposed new perpendicular curb ramps	Proposed high visibility crosswalk markings	Crossing priority Tier I Tier II Tier III	 NORTH
	Existing high visibility crosswalk markings	Proposed sidewalks		

The following page summarizes the planning level cost estimate spread for the proposed improvements.

**Bend Pedestrian Implementation Plan**  
**NE Neff Road Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittelson & Associates, Inc.			Date: June, 2023		
This Estimate has a Rating of:			<b>3C</b> (See rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
Mobilization	LS	ALL	\$47,000.00	\$47,000.00	
Traffic Control	LS	ALL	\$24,000.00	\$24,000.00	
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00	
Construction Survey	LS	ALL	\$10,000.00	\$10,000.00	
Removal of Structures and Obstructions	LS	ALL	\$10,000.00	\$10,000.00	
Clearing and Grubbing	LS	ALL	\$9,000.00	\$9,000.00	
General Earthworks	CY	600	\$40.00	\$24,000.00	
Asphalt Roadway - Full Depth	SF	2,850	\$8.20	\$23,370.00	
Concrete Curbs - Standard Curb	LF	1,425	\$30.00	\$42,750.00	
Concrete Walks	SF	8,550	\$10.50	\$89,775.00	
Detectable Warnings	EA	22	\$500.00	\$11,000.00	
Pedestrian Ramps	EA	22	\$5,000.00	\$110,000.00	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$106,000.00	\$106,000.00	
Pavement Markings, Complete	LS	ALL	\$2,000.00	\$2,000.00	
Signage, Complete	LS	ALL	\$2,000.00	\$2,000.00	
Illumination System, Complete	LS	ALL	\$30,700.00	\$30,700.00	
<b>TOTAL CONSTRUCTION COST</b>				<b>\$</b>	<b>545,595</b>
<b>ENGINEERING SUPPORT</b>					
Design Engineering	LS	ALL	\$120,000.00	\$120,000.00	
Construction Engineering & Management	LS	ALL	\$110,000.00	\$110,000.00	
<b>TOTAL PROJECT SUBTOTAL</b>				<b>\$</b>	<b>775,595</b>
<b>50% Contingency</b>				<b>\$</b>	<b>387,800</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$</b>	<b>1,163,395</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- New pedestrian ramps at Tucson Way (8x), Covington Ln (6x) Providence Dr (8x)
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included
- Perpendicular pedestrian ramps assumed at intersection corners

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

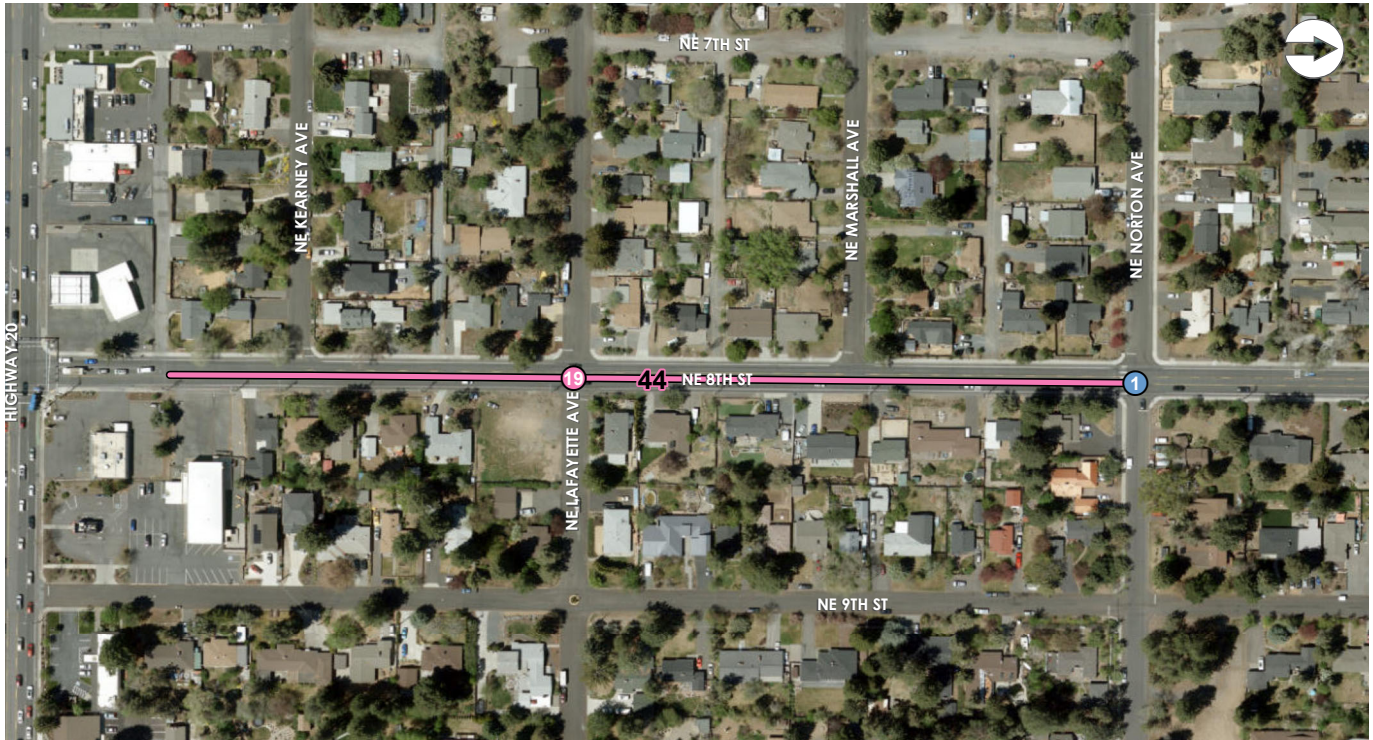
**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

## 2: NE 8<sup>th</sup> St Improvements: Segment ID 44 | Crossing ID 1 and 19



<b>From:</b>	166' north Highway 20	<b>To:</b>	NE Norton Ave
<b>Project Type:</b>	Sidewalk infill (gap one side); Enhanced crossing(s)		
<b>Length:</b>	0.23 Miles (1,234 feet)	<b>Planning Level</b>	\$1,200,000
		<b>Cost Estimate:</b>	
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on the east side of the roadway between 166' north of Highway 20 and NE Norton Ave.</li> <li>▶ Install an enhanced pedestrian crossing at NE 8<sup>th</sup> St/ NE Norton Ave. Explore pedestrian crossing improvements at 8<sup>th</sup> St/ NE Lafayette Ave.</li> <li>▶ Upgrade existing and construct new pedestrian ramps at intersections where improvements are proposed or determined necessary (28x).</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ A marked pedestrian crossings is provided at the NE 8<sup>th</sup> St/NE Norton Ave intersection; no marked crossings are provided at NE 8<sup>th</sup> St/ NE Lafayette Ave.</li> <li>▶ Nearby transit stops are located along Highway 20, south of the project extents.</li> <li>▶ Adjacent land use consists of single-family housing with parks and recreation spaces.</li> <li>▶ Multiple schools are located within 1 mile of project extents.</li> <li>▶ Sidewalk installation may require relocation of mailboxes, utility poles, stop signs, fire hydrants, and trees, etc.</li> </ul>		
<b>Potential Funding Sources</b>	<p>State: Safe Routes to School (SRTS), Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program.</p> <p>City: COVID Relief funds, general transportation grant funding.</p> <p>MPO: Carbon Reduction Program Funding.</p>		

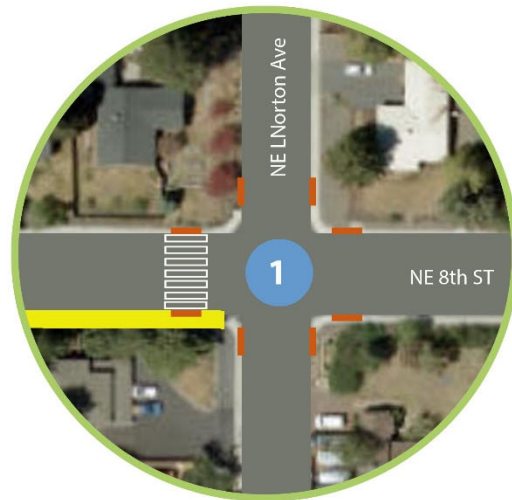
## 2: NE 8th St Improvements: Graphic Rendering & Concept Illustration








The following images illustrate a concept design for the recommended improvements described above.



NE 8th ST /  
NE LAFAYETTE AVE

NE 8th ST /  
NE NORTON AVE



LEGEND		Crossing priority		NORTH	
	Proposed new perpendicular curb ramps		Proposed high visibility crosswalk markings		
	Existing high visibility crosswalk markings		Proposed sidewalks		Tier II
					Tier III

The following page summarizes the planning level cost estimate spread for the proposed improvements.

**Bend Pedestrian Implementation Plan**  
**NE 8th Street Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittelson & Associates, Inc.			Date: June, 2023		
This Estimate has a Rating of:			<b>3C</b> (See rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
Mobilization	LS	ALL	\$48,000.00	\$48,000.00	
Traffic Control	LS	ALL	\$25,000.00	\$25,000.00	
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00	
Construction Survey	LS	ALL	\$10,000.00	\$10,000.00	
Removal of Structures and Obstructions	LS	ALL	\$11,000.00	\$11,000.00	
Clearing and Grubbing	LS	ALL	\$10,000.00	\$10,000.00	
General Earthworks	CY	600	\$40.00	\$24,000.00	
Asphalt Roadway - Full Depth	SF	2,468	\$8.20	\$20,237.60	
Concrete Curbs - Standard Curb	LF	1,234	\$30.00	\$37,020.00	
Concrete Walks	SF	7,404	\$10.50	\$77,742.00	
Detectable Warnings	EA	28	\$500.00	\$14,000.00	
Pedestrian Ramps	EA	28	\$5,000.00	\$140,000.00	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$110,000.00	\$110,000.00	
Pavement Markings, Complete	LS	ALL	\$2,000.00	\$2,000.00	
Signage, Complete	LS	ALL	\$2,000.00	\$2,000.00	
Illumination System, Complete	LS	ALL	\$31,300.00	\$31,300.00	
<b>TOTAL CONSTRUCTION COST</b>				<b>\$</b>	<b>566,300</b>
<b>ENGINEERING SUPPORT</b>					
Design Engineering	LS	ALL	\$120,000.00	\$120,000.00	
Construction Engineering & Management	LS	ALL	\$114,000.00	\$114,000.00	
<b>TOTAL PROJECT SUBTOTAL</b>				<b>\$</b>	<b>800,300</b>
<b>50% Contingency</b>				<b>\$</b>	<b>400,150</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$</b>	<b>1,200,450</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- New pedestrian ramps at Kearney Ave (6x), Lafayette Ave (8x), Marshall Ave (6x), Norton (8x)
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included
- Perpendicular pedestrian ramps assumed at intersection corners

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

### 3: SE 9<sup>th</sup> St Improvements: Segment ID 1

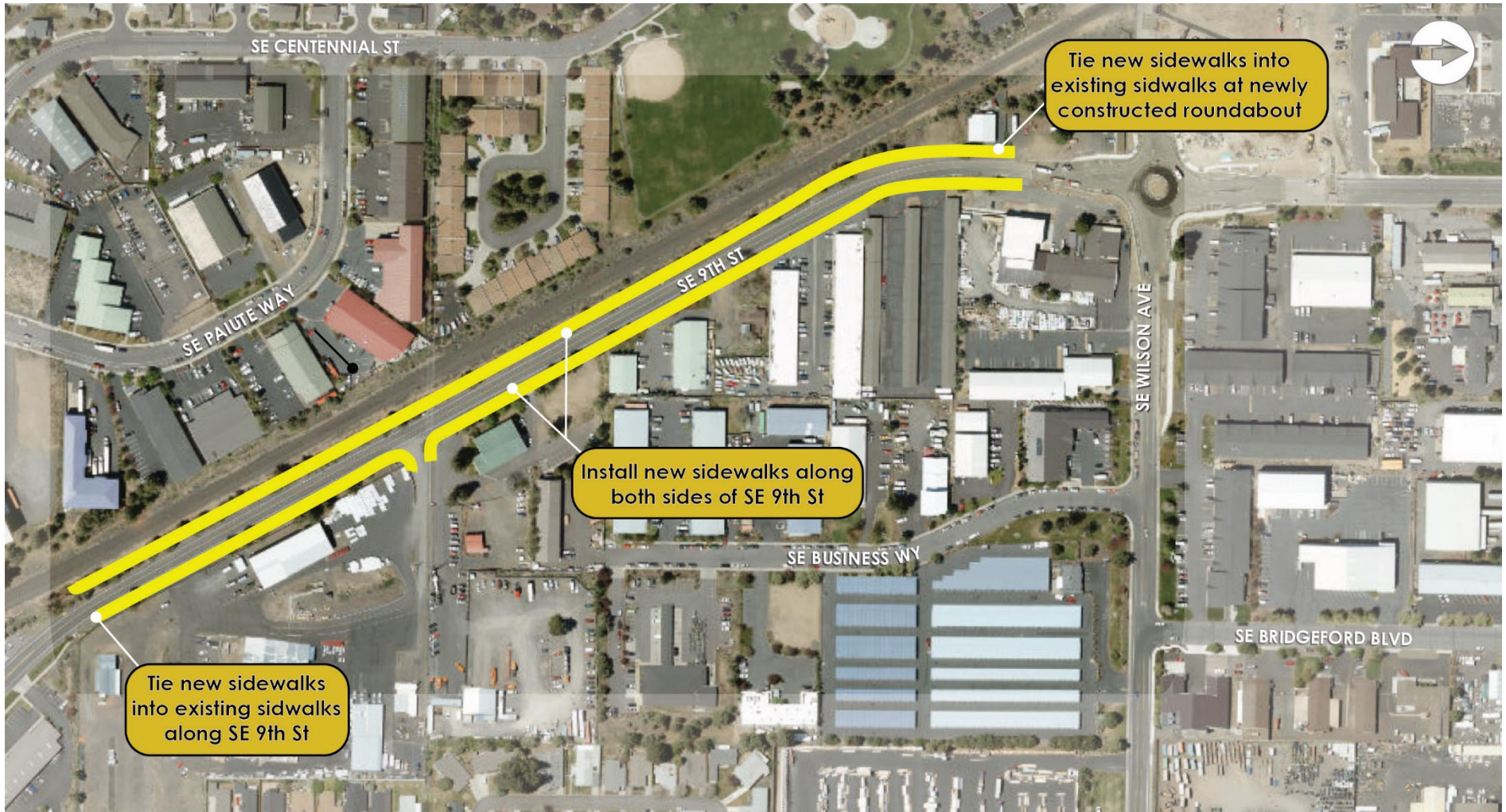


<b>From:</b>	225' north of SE Reed Market	<b>To:</b>	SE Wilson Ave
<b>Project Type:</b>	Sidewalk infill (gap both sides)		
<b>Length:</b>	0.53 Miles (2,800 feet)	<b>Planning Level Cost Estimate:</b>	\$2,370,000
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on both sides of the roadway between 225' north of SE Reed Market and SE Wilson Ave.</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ Identified on Key Route</li> <li>▶ The SE 9<sup>th</sup> St/SE Wilson Rd intersection has a newly constructed roundabout. Sidewalks approaching the roundabout have recently been installed and may not need improvements.</li> <li>▶ No transit stops are located nearby. The nearest stop is located 1 mile away along SE 3<sup>rd</sup> St, west of the project extents.</li> <li>▶ Adjacent parcels predominantly consist of industrial land use with large warehouses and storage facilities located in the east. Land use to the west of the project extents are single family homes and recreation spaces.</li> <li>▶ If funding is limited, sidewalks should be prioritized on the east side of SE 9<sup>th</sup> St due to limited connectivity on the west side because of the railroad.</li> <li>▶ Project may be addressed as part of Greenways Phase IV project.</li> </ul>		
<b>Potential Funding Sources</b>	<p>State: Safe Routes to School (SRTS), Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program.</p> <p>City: COVID Relief funds, general transportation grant funding.</p> <p>MPO: Carbon Reduction Program Funding.</p>		



### 3: SE 9th St Improvements: Graphic Rendering & Concept Illustration

The following image illustrates a concept design for the recommended improvements described above.



The following page summarizes the planning level cost estimate spread for the proposed improvements.

**Bend Pedestrian Implementation Plan**  
**SE 9th Street Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittelson & Associates, Inc.			Date: June, 2023	
This Estimate has a Rating of:			<b>3C</b> (See rating scale guide below.)	
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
Mobilization	LS	ALL	\$95,000.00	\$95,000.00
Traffic Control	LS	ALL	\$49,000.00	\$49,000.00
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00
Construction Survey	LS	ALL	\$19,000.00	\$19,000.00
Removal of Structures and Obstructions	LS	ALL	\$21,000.00	\$21,000.00
Clearing and Grubbing	LS	ALL	\$19,000.00	\$19,000.00
General Earthworks	CY	600	\$40.00	\$24,000.00
Asphalt Roadway - Full Depth	SF	11,200	\$8.20	\$91,840.00
Concrete Curbs - Standard Curb	LF	5,600	\$30.00	\$168,000.00
Concrete Walks	SF	33,600	\$10.50	\$352,800.00
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$223,000.00	\$223,000.00
Illumination System, Complete	LS	ALL	\$48,600.00	\$48,600.00
<b>TOTAL CONSTRUCTION COST \$</b>				<b>1,115,240</b>
<b>ENGINEERING SUPPORT</b>				
Design Engineering	LS	ALL	\$240,000.00	\$240,000.00
Construction Engineering & Management	LS	ALL	\$224,000.00	\$224,000.00
<b>TOTAL PROJECT SUBTOTAL \$</b>				<b>1,579,240</b>
<b>50% Contingency \$</b>				<b>789,620</b>
<b>TOTAL ESTIMATED PROJECT COST \$</b>				<b>2,368,860</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

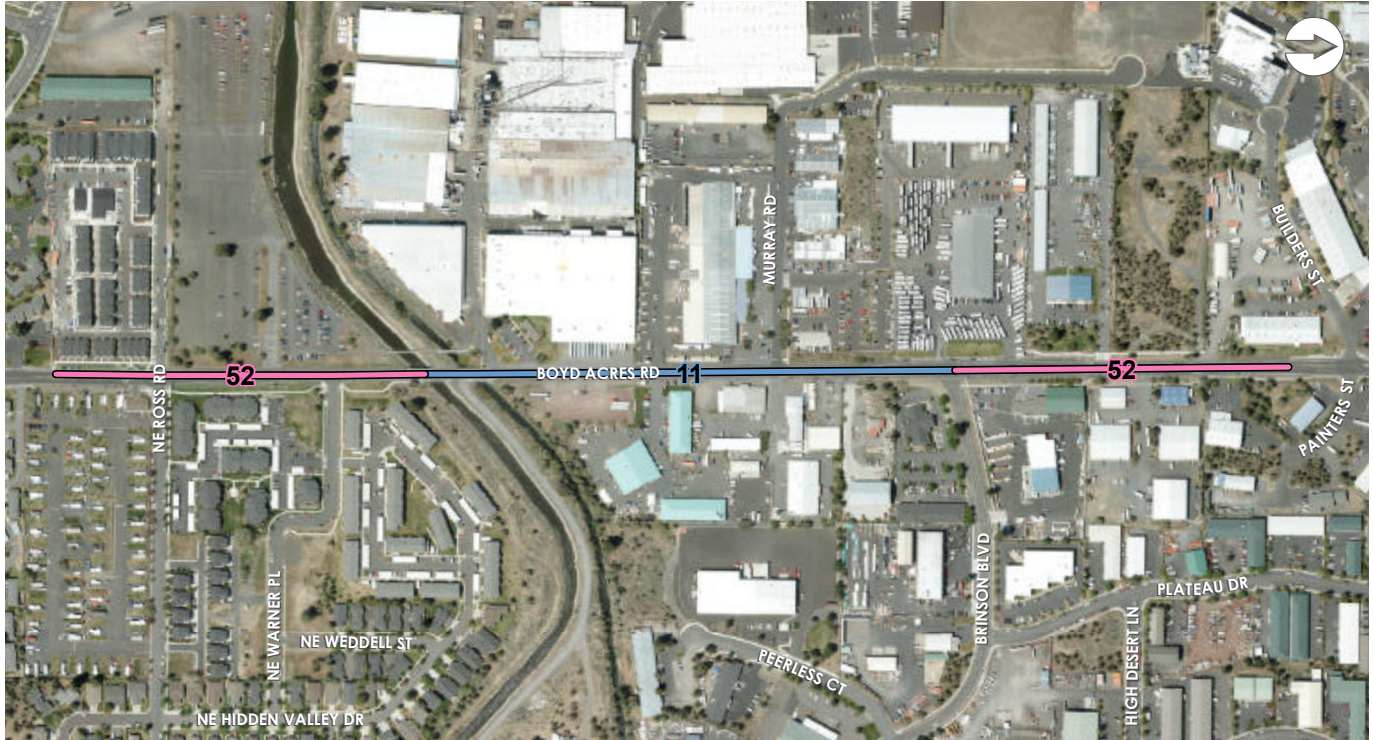
**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

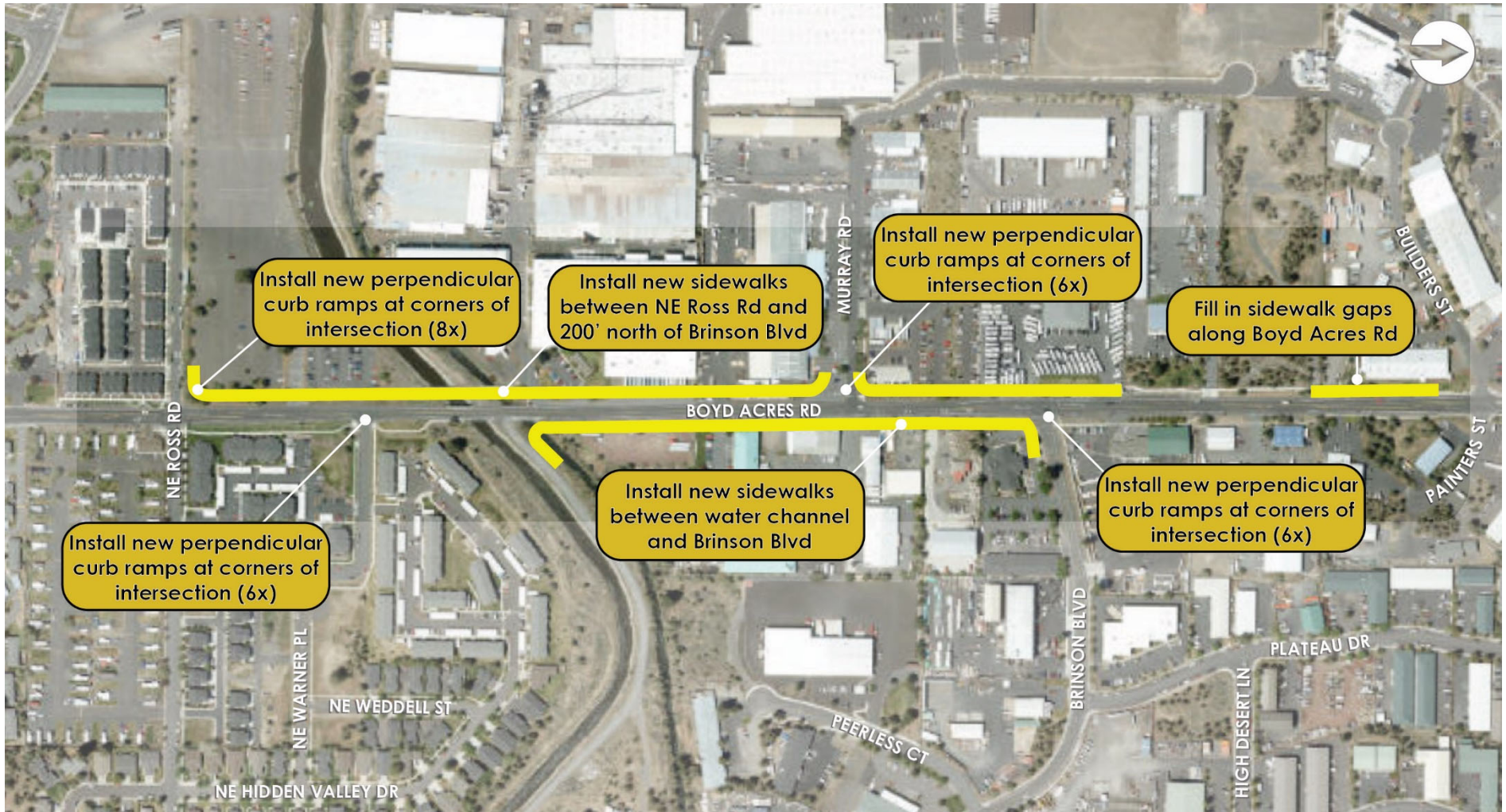
## 4: Boyd Acres Road Improvements: Segment ID 11 and 52



<b>From:</b>	300' south of NE Ross Rd	<b>To:</b>	160' south of Builders St/Painters St
<b>Project Type:</b>	Sidewalk infill (gap one and both sides)		
<b>Length:</b>	0.7 Miles (3,450 feet)	<b>Planning Level Cost Estimate</b>	\$2,460,000
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on both sides of Boyd Acres Rd within segment 10 and fill sidewalk gaps on the west side within segment 49.</li> <li>▶ Upgrade existing and construct new pedestrian ramps at intersections where improvements are proposed or determined necessary (26x).</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ Identified on Key Route</li> <li>▶ No marked pedestrian crossings are provided within the project extents.</li> <li>▶ Boyd Acres Rd/NE Brinson Blvd is an all-way stop control intersection.</li> <li>▶ Adjacent land use predominantly consists of retail and industrial land use with pockets of underutilized spaces. No transit stops are located nearby.</li> <li>▶ Narrow sidewalks are provided over the canal, creating challenges with ADA accessibility.</li> <li>▶ Project likely to be addressed with the Boyd Acres and Butler Market Key Routes project.</li> </ul>		
<b>Potential Funding Sources</b>	<p>State: Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program.</p> <p>City: COVID Relief funds, general transportation grant funding</p> <p>MPO: Carbon Reduction Program Funding</p>		

#### 4: Boyd Acres Road Improvements: Graphic Rendering & Concept Illustration

The following image illustrates a concept design for the recommended improvements described above.



The following page summarizes the planning level cost estimate spread for the proposed improvements.

**Bend Pedestrian Implementation Plan**  
**Boyd Acres Road Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittelson & Associates, Inc.			Date: June, 2023		
This Estimate has a Rating of:			<b>3C</b> (See rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
Mobilization	LS	ALL	\$100,000.00	\$100,000.00	
Traffic Control	LS	ALL	\$51,000.00	\$51,000.00	
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00	
Construction Survey	LS	ALL	\$20,000.00	\$20,000.00	
Removal of Structures and Obstructions	LS	ALL	\$22,000.00	\$22,000.00	
Clearing and Grubbing	LS	ALL	\$19,000.00	\$19,000.00	
General Earthworks	CY	600	\$40.00	\$24,000.00	
Asphalt Roadway - Full Depth	SF	9,140	\$8.20	\$74,948.00	
Concrete Curbs - Standard Curb	LF	4,570	\$30.00	\$137,100.00	
Concrete Walks	SF	27,420	\$10.50	\$287,910.00	
Detectable Warnings	EA	26	\$500.00	\$13,000.00	
Pedestrian Ramps	EA	26	\$5,000.00	\$130,000.00	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$234,000.00	\$234,000.00	
Illumination System, Complete	LS	ALL	\$49,000.00	\$49,000.00	
<b>TOTAL CONSTRUCTION COST</b>				<b>\$</b>	<b>1,165,958</b>
<b>ENGINEERING SUPPORT</b>					
Design Engineering	LS	ALL	\$240,000.00	\$240,000.00	
Construction Engineering & Management	LS	ALL	\$234,000.00	\$234,000.00	
<b>TOTAL PROJECT SUBTOTAL</b>				<b>\$</b>	<b>1,639,958</b>
<b>50% Contingency</b>				<b>\$</b>	<b>819,980</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$</b>	<b>2,459,938</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- New pedestrian ramps at Ross Rd (8x), Warner Pl (6x), Murray Rd (6x), Brinson Blvd (6x)
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included
- Perpendicular pedestrian ramps assumed at intersection corners

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

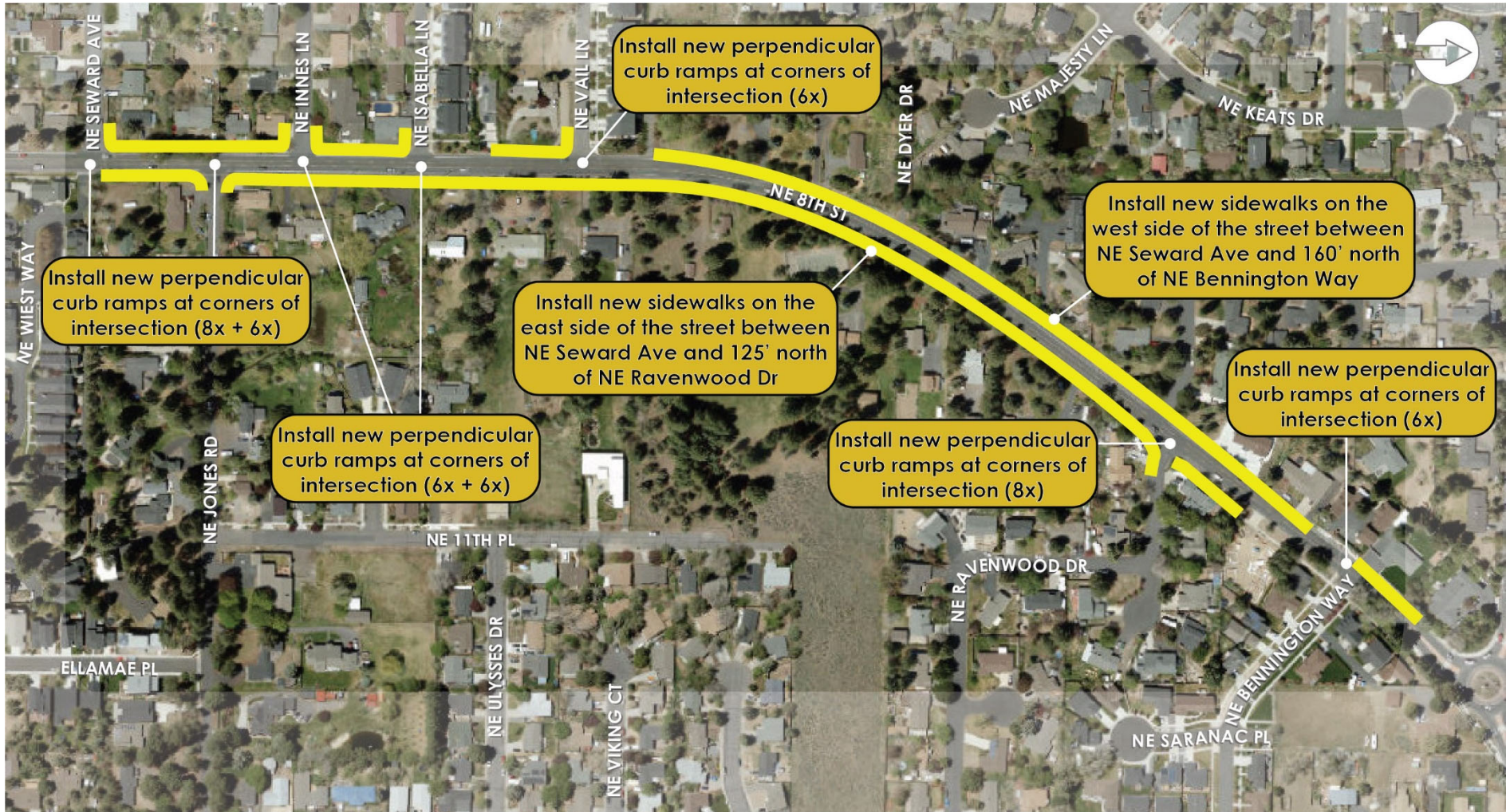
## 5: NE 8<sup>th</sup> St Improvements: Segment ID 7 and 46



<b>From:</b>	NE Seward Ave	<b>To:</b>	160' north of NE Bennington Way
<b>Project Type:</b>	Sidewalk infill (gap one and both sides)		
<b>Length:</b>	0.54 Miles (2,900 feet)	<b>Planning Level Cost Estimate:</b>	\$3,010,000
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on both sides of the street between NE Seward Ave and NE Bennington Way within segment 7. Install sidewalk gaps along the segments marked 46 (varies east and west sides).</li> <li>▶ Upgrade existing and construct new pedestrian ramps at intersections where improvements are proposed or determined necessary (46x).</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ No marked pedestrian crossings are provided within the project extents.</li> <li>▶ No transit stops are located nearby.</li> <li>▶ Adjacent land use predominantly consists of single-family housing with parks and recreation centers. A school is located within 0.2 miles of the project extents.</li> </ul>		
<b>Potential Funding Sources</b>	<p>State: Safe Routes to School (SRTS), Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program.</p> <p>City: COVID Relief funds, general transportation grant funding</p> <p>MPO: Carbon Reduction Program Funding</p>		

## 5\_NE 8<sup>th</sup> St Improvements: Graphic Rendering & Concept Illustration

The following image illustrates a concept design for the recommended improvements described above.



The following page summarizes the planning level cost estimate spread for the proposed improvements.

**Bend Pedestrian Implementation Plan**  
**NE 8th Street Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittelson & Associates, Inc.			Date: June, 2023		
This Estimate has a Rating of:			<b>3C</b> (See rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
Mobilization	LS	ALL	\$126,000.00	\$126,000.00	
Traffic Control	LS	ALL	\$65,000.00	\$65,000.00	
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00	
Construction Survey	LS	ALL	\$26,000.00	\$26,000.00	
Removal of Structures and Obstructions	LS	ALL	\$27,000.00	\$27,000.00	
Clearing and Grubbing	LS	ALL	\$24,000.00	\$24,000.00	
General Earthworks	CY	600	\$40.00	\$24,000.00	
Asphalt Roadway - Full Depth	SF	10,390	\$8.20	\$85,198.00	
Concrete Curbs - Standard Curb	LF	5,195	\$30.00	\$155,850.00	
Concrete Walks	SF	31,170	\$10.50	\$327,285.00	
Detectable Warnings	EA	46	\$500.00	\$23,000.00	
Pedestrian Ramps	EA	46	\$5,000.00	\$230,000.00	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$296,000.00	\$296,000.00	
Illumination System, Complete	LS	ALL	\$58,000.00	\$58,000.00	
<b>TOTAL CONSTRUCTION COST</b>				<b>\$</b>	<b>1,471,333</b>
<b>ENGINEERING SUPPORT</b>					
Design Engineering	LS	ALL	\$240,000.00	\$240,000.00	
Construction Engineering & Management	LS	ALL	\$295,000.00	\$295,000.00	
<b>TOTAL PROJECT SUBTOTAL</b>				<b>\$</b>	<b>2,006,333</b>
<b>50% Contingency</b>				<b>\$</b>	<b>1,003,170</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$</b>	<b>3,009,503</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- New pedestrian ramps at Seward Ave (8x), Jones Rd (6x), Innes Ln (6x), Isabella Ln (6x), Vail Ln (6x), Ravenwood Dr (8x), Bennington (6x)
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included
- Perpendicular pedestrian ramps assumed at intersection corners

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

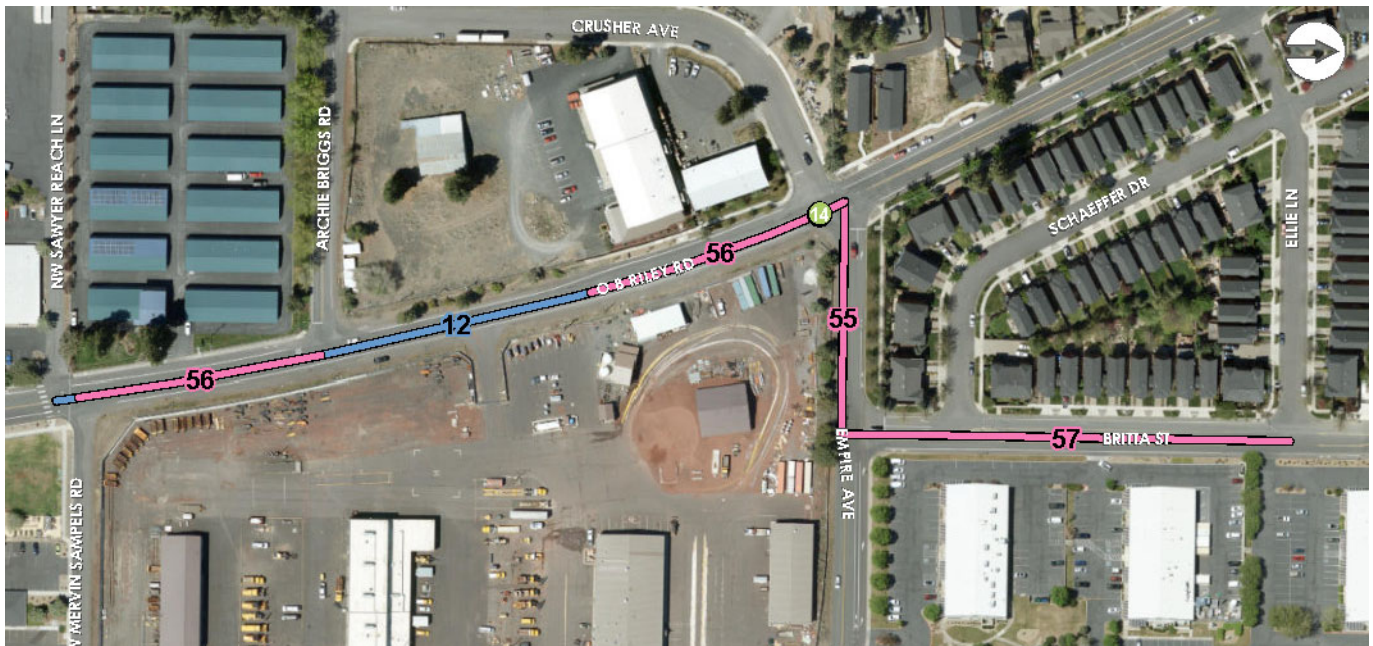
**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.



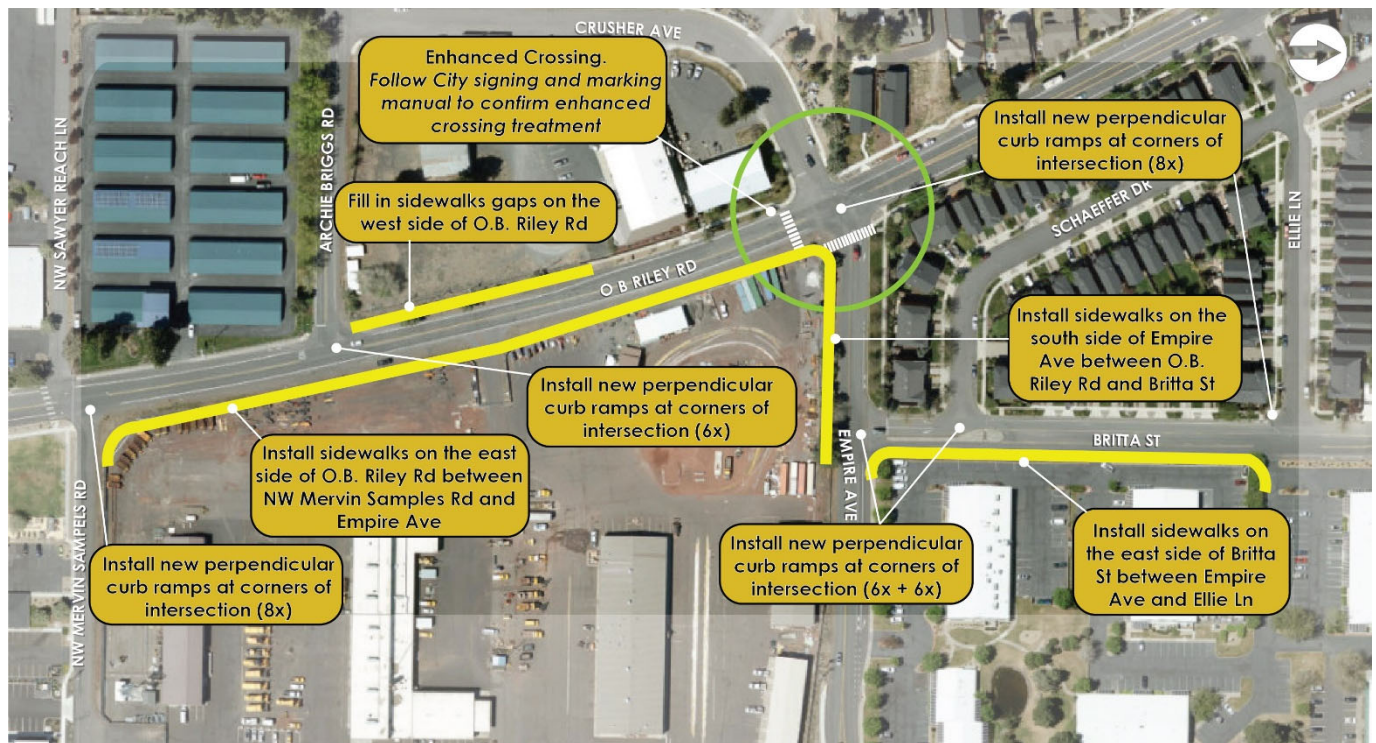
6: O.B. Riley Rd/Empire Ave/Britta St Improvements: Segment ID 12, 55, 56, 57 | Crossing ID 14



<b>From:</b>	Sawyer Reach Ln O.B. Riley Rd Empire Ave	<b>To:</b>	Empire Ave (O.B. Riley Rd) Britta St (Empire Ave) Ellie Ln (Britta St)
<b>Project Type:</b>	Sidewalk infill (gap one and both sides); Enhanced crossing		
<b>Length:</b>	0.36 Miles (1,900 feet)	<b>Planning Level Cost Estimate</b>	\$1,900,000
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on both sides of O.B. Riley Rd within segment 12 and sidewalk gaps on the east side of O.B. Riley Rd within segment 56.</li> <li>▶ Install sidewalks on the south side of Empire Ave within segment 55.</li> <li>▶ Install sidewalks on the east side of Britta St within segment 57.</li> <li>▶ Install an enhanced pedestrian crossing at Crusher Ave/Empire Ave/O.B. Riley Rd.</li> <li>▶ Upgrade existing and construct new pedestrian ramps at intersections where improvements are proposed or determined necessary (40x).</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ Identified on Key Route</li> <li>▶ No marked pedestrian crossings are provided within the project extents.</li> <li>▶ Adjacent land use consists of a mix of industrial and residential.</li> <li>▶ No transit stops are located nearby.</li> </ul>		
<b>Potential Funding Sources</b>	State: Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program. City: COVID Relief funds, general transportation grant funding MPO: Carbon Reduction Program Funding		









## 6: O.B. Riley Rd/Empire Ave/Britta St Improvements: Graphic & Concept Illustration

The following image illustrates a concept design for the recommended improvements described above.



O.B. RILEY RD /  
EMPIRE AVE



LEGEND	 Proposed new perpendicular curb ramps	 Proposed high visibility crosswalk markings	Crossing priority  Tier I  Tier II  Tier III	 NORTH
	 Proposed sidewalks	 Existing high visibility crosswalk markings		

**Bend Pedestrian Implementation Plan**  
**O.B. Riley/Empire Ave/Britta St Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittelson & Associates, Inc.			Date: June, 2023		
This Estimate has a Rating of:			3C (See rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
Mobilization	LS	ALL	\$73,000.00	\$73,000.00	
Traffic Control	LS	ALL	\$38,000.00	\$38,000.00	
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00	
Construction Survey	LS	ALL	\$15,000.00	\$15,000.00	
Removal of Structures and Obstructions	LS	ALL	\$16,000.00	\$16,000.00	
Clearing and Grubbing	LS	ALL	\$14,000.00	\$14,000.00	
General Earthworks	CY	600	\$40.00	\$24,000.00	
Asphalt Roadway - Full Depth	SF	4,400	\$8.20	\$36,080.00	
Concrete Curbs - Standard Curb	LF	2,200	\$30.00	\$66,000.00	
Concrete Walks	SF	13,200	\$10.50	\$138,600.00	
Detectable Warnings	EA	40	\$500.00	\$20,000.00	
Pedestrian Ramps	EA	40	\$5,000.00	\$200,000.00	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$170,000.00	\$170,000.00	
Illumination System, Complete	LS	ALL	\$39,900.00	\$39,900.00	
<b>TOTAL CONSTRUCTION COST</b>				<b>\$</b>	<b>854,580</b>
<b>ENGINEERING SUPPORT</b>					
Design Engineering	LS	ALL	\$240,000.00	\$240,000.00	
Construction Engineering & Management	LS	ALL	\$171,000.00	\$171,000.00	
<b>TOTAL PROJECT SUBTOTAL</b>				<b>\$</b>	<b>1,265,580</b>
<b>50% Contingency</b>				<b>\$</b>	<b>632,790</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$</b>	<b>1,898,370</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- New pedestrian ramps at Mervin Sampels Rd (8x), Archile Briggs Rd (6x), Empire Ave/O.B. Riley (8x), Empire Ave/Britta St (6x), Schaeffer Dr (6x), Ellie Ln
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included
- Perpendicular pedestrian ramps assumed at intersection corners

**Scope Accuracy:**

- Level 1:** Project scope well understood and well defined.
- Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.
- Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

- Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.
- Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.
- Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

## 7: Juniper Park Access Improvements: Segment ID 4, 5, 43



<b>From/To:</b>	See map above (blue = sidewalk need both sides; pink = sidewalk need on side).		
<b>Project Type:</b>	Sidewalk infill (gap one and both sides)		
<b>Length:</b>	0.7 Miles (6,000 feet)	<b>Planning Level Cost Estimate</b>	\$3,620,000
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on both sides of segment(s) 4 and 5 and fill sidewalk gaps on segment(s) 43</li> <li>▶ Upgrade existing and construct new pedestrian ramps at intersections where improvements are proposed or determined necessary (66x).</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ Fills sidewalk gaps providing access to Juniper Park</li> <li>▶ Identified on Key Route (SE 6<sup>th</sup> Street)</li> <li>▶ Adjacent land use predominantly consists of residential and open space/recreational.</li> <li>▶ Transit is provided along NE 3<sup>rd</sup> St an NE Franklin Ave.</li> <li>▶ Identified on Key Route (Hawthorne St and portions of NE 5<sup>th</sup>, Irving Ave, NE 6<sup>th</sup> St.</li> </ul>		
<b>Potential Funding Sources</b>	State: Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program. City: COVID Relief funds, general transportation grant funding MPO: Carbon Reduction Program Funding		

## 7: Juniper Park Access Improvements: Graphic & Concept Illustration

The following image illustrates a concept design for the recommended improvements described above.



**Bend Pedestrian Implementation Plan**  
**Juniper Park Access Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittleson & Associates, Inc.			Date: June, 2023	
This Estimate has a Rating of:			<b>3C</b> (See rating scale guide below.)	
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
Mobilization	LS	ALL	\$155,000.00	\$155,000.00
Traffic Control	LS	ALL	\$79,000.00	\$79,000.00
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00
Construction Survey	LS	ALL	\$31,000.00	\$31,000.00
Removal of Structures and Obstructions	LS	ALL	\$34,000.00	\$34,000.00
Clearing and Grubbing	LS	ALL	\$30,000.00	\$30,000.00
General Earthworks	CY	600	\$40.00	\$24,000.00
Asphalt Roadway - Full Depth	SF	12,000	\$8.20	\$98,400.00
Concrete Curbs - Standard Curb	LF	6,000	\$30.00	\$180,000.00
Concrete Walks	SF	36,000	\$10.50	\$378,000.00
Detectable Warnings	EA	66	\$500.00	\$33,000.00
Pedestrian Ramps	EA	66	\$5,000.00	\$330,000.00
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$366,000.00	\$366,000.00
Illumination System, Complete	LS	ALL	\$67,900.00	\$67,900.00
<b>TOTAL CONSTRUCTION COST</b>				<b>\$ 1,810,300</b>
<b>ENGINEERING SUPPORT</b>				
Design Engineering	LS	ALL	\$240,000.00	\$240,000.00
Construction Engineering & Management	LS	ALL	\$363,000.00	\$363,000.00
<b>TOTAL PROJECT SUBTOTAL</b>				<b>\$ 2,413,300</b>
<b>50% Contingency</b>				<b>\$ 1,206,650</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$ 3,619,950</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- New pedestrian ramps at Irving Ave/4th St (8x), Irving Ave/5th St (8x), Irving Ave/6th St (8x), Irving Ave/7th St (8x), Irving Ave/8th St (8x), Hawthorne Ave/4th St (6x), Hawthorne Ave/5th St (8x), Greeley Ave/4th St (6x), Greeley Ave/5th St (6x)
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included
- Perpendicular pedestrian ramps assumed at intersection corners

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear. (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

## 8: 18<sup>th</sup> Street Improvements: Segment ID 15, 53 | Crossing ID 26



<b>From:</b>	NE Sierra Dr	<b>To:</b>	160' east of Lithic Ct
<b>Project Type:</b>	Sidewalk infill (gap one and both sides); Enhanced crossing		
<b>Length:</b>	0.24 Miles (1,250 feet)	<b>Planning Level Cost Estimate</b>	\$1,280,000
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on both sides of 18<sup>th</sup> St within segment 15 and fill sidewalk gaps on the east side of 18<sup>th</sup> Street within segment 53.</li> <li>▶ Upgrade existing and construct new pedestrian ramps at intersections where improvements are proposed or determined necessary (14x).</li> <li>▶ Install an enhanced pedestrian crossing at NE Sierra Dr.</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ No marked pedestrian crossings are provided within the project extents.</li> <li>▶ Consider connectivity to trail crossing over canal (east of 18<sup>th</sup> St)</li> <li>▶ Adjacent land use primarily consists of residential.</li> <li>▶ No transit stops are located nearby.</li> </ul>		
<b>Potential Funding Sources</b>	State: Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program. City: COVID Relief funds, general transportation grant funding MPO: Carbon Reduction Program Funding		









## 8: 18th Street Improvements: Graphic & Concept Illustration

The following image illustrates a concept design for the recommended improvements described above.



18 TH ST /  
NE SIERRA DR



LEGEND	 Proposed new perpendicular curb ramps	 Proposed high visibility crosswalk markings	Crossing priority	 Tier I  Tier II  Tier III	 NORTH
	 Proposed sidewalks	 Existing high visibility crosswalk markings			



**Bend Pedestrian Implementation Plan**  
**18th Street Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittleson & Associates, Inc.			Date: June, 2023		
This Estimate has a Rating of:			<b>3C</b> (See rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
Mobilization	LS	ALL	\$43,000.00	\$43,000.00	
Traffic Control	LS	ALL	\$23,000.00	\$23,000.00	
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00	
Construction Survey	LS	ALL	\$9,000.00	\$9,000.00	
Removal of Structures and Obstructions	LS	ALL	\$10,000.00	\$10,000.00	
Clearing and Grubbing	LS	ALL	\$9,000.00	\$9,000.00	
General Earthworks	CY	600	\$40.00	\$24,000.00	
Asphalt Roadway - Full Depth	SF	3,300	\$8.20	\$27,060.00	
Concrete Curbs - Standard Curb	LF	1,650	\$30.00	\$49,500.00	
Concrete Walks	SF	9,900	\$10.50	\$103,950.00	
Detectable Warnings	EA	14	\$500.00	\$7,000.00	
Pedestrian Ramps	EA	14	\$5,000.00	\$70,000.00	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$99,000.00	\$99,000.00	
Illumination System, Complete	LS	ALL	\$29,700.00	\$29,700.00	
<b>TOTAL CONSTRUCTION COST</b>				<b>\$</b>	<b>508,210</b>
<b>ENGINEERING SUPPORT</b>					
Design Engineering	LS	ALL	\$240,000.00	\$240,000.00	
Construction Engineering & Management	LS	ALL	\$102,000.00	\$102,000.00	
<b>TOTAL PROJECT SUBTOTAL</b>				<b>\$</b>	<b>850,210</b>
<b>50% Contingency</b>				<b>\$</b>	<b>425,110</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$</b>	<b>1,275,320</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- New pedestrian ramps at Sierra Dr (8x) and Watercress Way (6x).
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included
- Perpendicular pedestrian ramps assumed at intersection corners

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

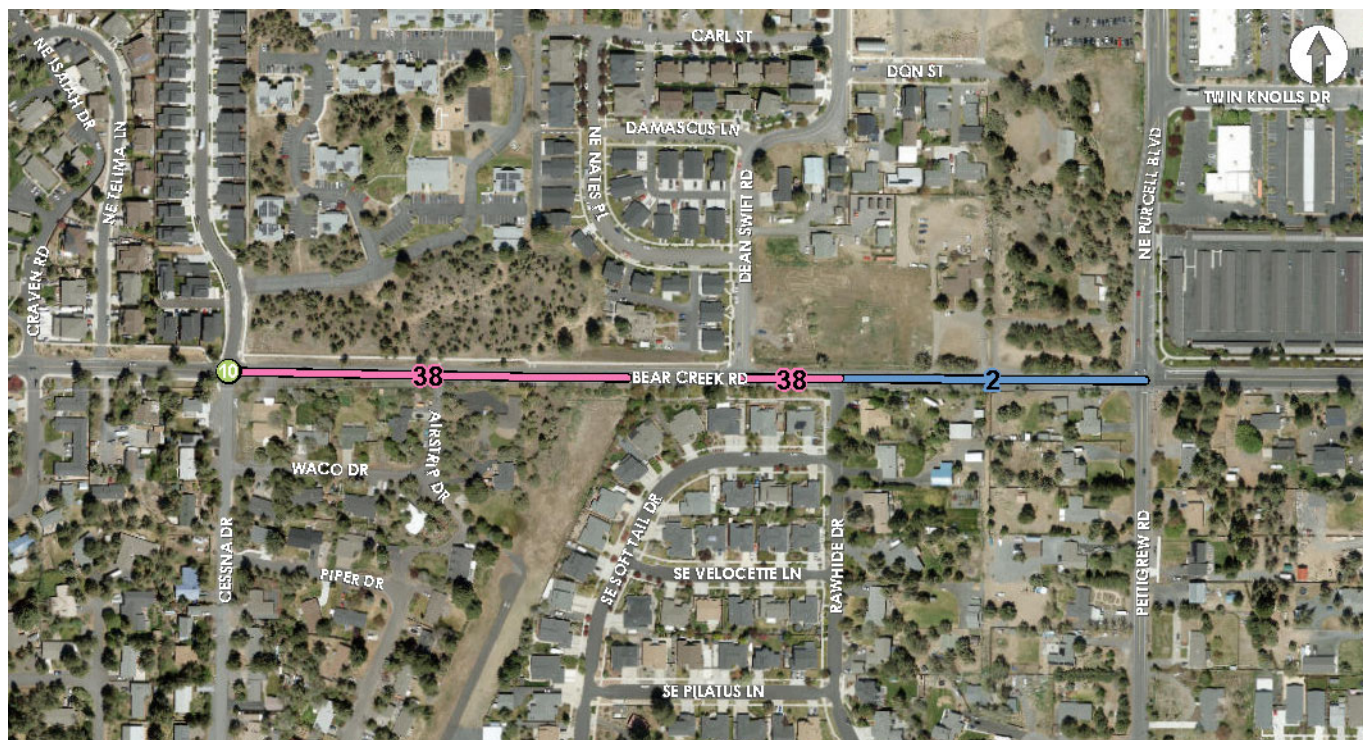
**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

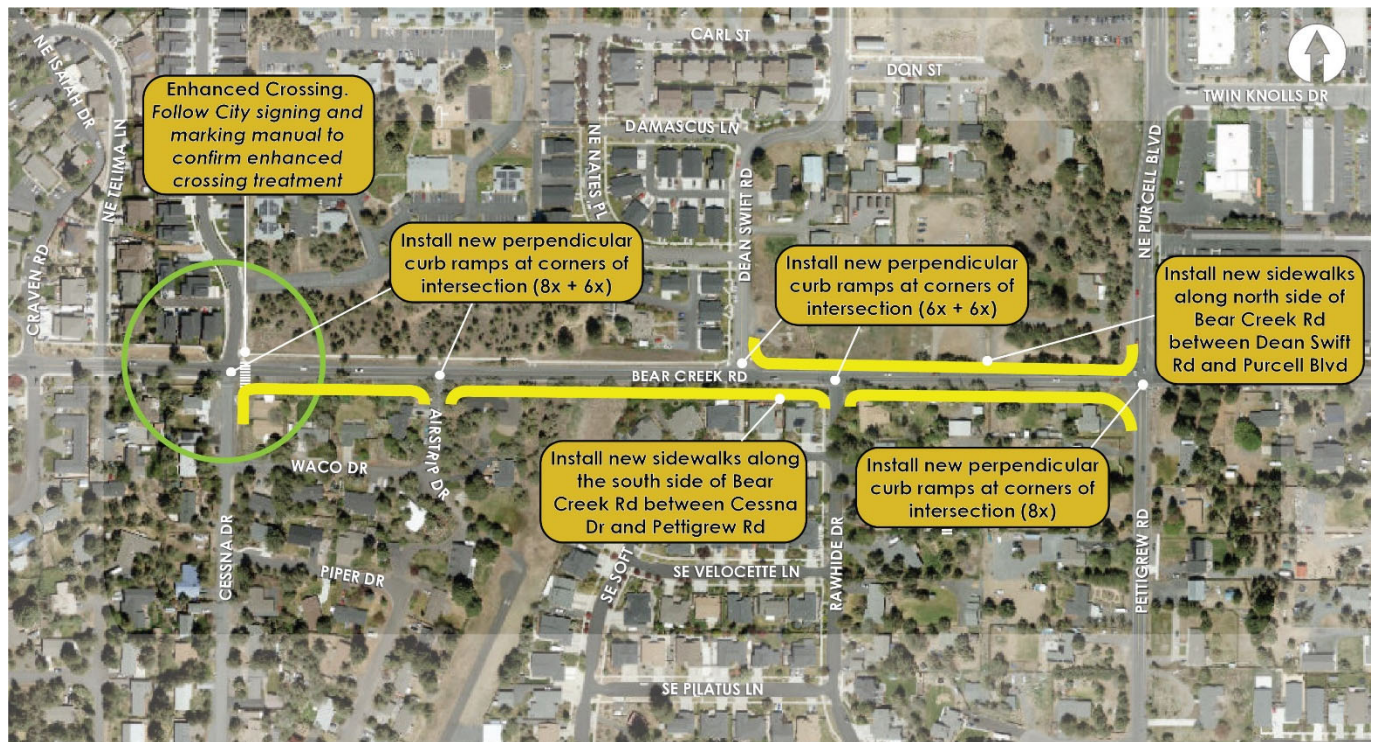
## 9: Bear Creek Rd Improvements: Segment ID 2, 38 | Crossing ID 10



<b>From:</b>	Cessna Dr	<b>To:</b>	Pettigrew Rd/NE Purcell Blvd
<b>Project Type:</b>	Sidewalk infill (gap one and both sides); Enhanced crossing		
<b>Length:</b>	0.37 Miles (2,000 feet)	<b>Planning Level Cost Estimate</b>	\$1,860,000
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on both sides of Bear Creek Rd within segment 2 and fill sidewalk gaps on the south side within segment 38.</li> <li>▶ Upgrade existing and construct new pedestrian ramps at intersections where improvements are proposed or determined necessary (34x).</li> <li>▶ Install an enhanced pedestrian crossing at Cessna Dr.</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ Identified on Key Route</li> <li>▶ Project may be addressed as part of the Bear Creek and 27th Street Improvements project</li> <li>▶ No marked pedestrian crossings are provided within the project extents.</li> <li>▶ Pettigrew Rd/NE Purcell Blvd/Bear Creek Rd is an all-way stop control intersection.</li> <li>▶ Adjacent land use predominantly consists of residential.</li> <li>▶ No transit stops are located nearby.</li> </ul>		
<b>Potential Funding Sources</b>	<p>State: Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program.</p> <p>City: COVID Relief funds, general transportation grant funding</p> <p>MPO: Carbon Reduction Program Funding</p>		









## 9: Bear Creek Rd Improvements: Graphic & Concept Illustration

The following image illustrates a concept design for the recommended improvements described above.



BEAR CREEK RD /  
CESSNA DR



LEGEND		Crossing priority	
	Proposed new perpendicular curb ramps		Tier I
	Proposed high visibility crosswalk markings		Tier II
	Existing high visibility crosswalk markings		Tier III
	Proposed sidewalks		NORTH

**Bend Pedestrian Implementation Plan**  
**Bear Creek Rd Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittleson & Associates, Inc.			Date: June, 2023		
This Estimate has a Rating of:			<b>3C</b> (See rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
Mobilization	LS	ALL	\$71,000.00	\$71,000.00	
Traffic Control	LS	ALL	\$37,000.00	\$37,000.00	
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00	
Construction Survey	LS	ALL	\$15,000.00	\$15,000.00	
Removal of Structures and Obstructions	LS	ALL	\$16,000.00	\$16,000.00	
Clearing and Grubbing	LS	ALL	\$14,000.00	\$14,000.00	
General Earthworks	CY	600	\$40.00	\$24,000.00	
Asphalt Roadway - Full Depth	SF	4,720	\$8.20	\$38,704.00	
Concrete Curbs - Standard Curb	LF	2,360	\$30.00	\$70,800.00	
Concrete Walks	SF	14,160	\$10.50	\$148,680.00	
Detectable Warnings	EA	34	\$500.00	\$17,000.00	
Pedestrian Ramps	EA	34	\$5,000.00	\$170,000.00	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$165,000.00	\$165,000.00	
Illumination System, Complete	LS	ALL	\$39,100.00	\$39,100.00	
<b>TOTAL CONSTRUCTION COST</b>				<b>\$</b>	<b>830,284</b>
<b>ENGINEERING SUPPORT</b>					
Design Engineering	LS	ALL	\$240,000.00	\$240,000.00	
Construction Engineering & Management	LS	ALL	\$167,000.00	\$167,000.00	
<b>TOTAL PROJECT SUBTOTAL</b>				<b>\$</b>	<b>1,237,284</b>
<b>50% Contingency</b>				<b>\$</b>	<b>618,650</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$</b>	<b>1,855,934</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- New pedestrian ramps at Cessna Dr (8x), Airstrip Dr (6x), Dean Swift Rd (6x), Rawhide Dr (6x), Pettigrew/Purcell Blvd (8x).
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included
- Perpendicular pedestrian ramps assumed at intersection corners

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

## 10: SE 2<sup>nd</sup> St Improvements: Segment ID 3, 37



<b>From:</b>	SE Cleveland Ave	<b>To:</b>	185' north of Taft Ave
<b>Project Type:</b>	Sidewalk infill (gap one and both sides)		
<b>Length:</b>	0.22 Miles (1,150 feet)	<b>Planning Level Cost Estimate</b>	\$1,380,000
<b>Description:</b>	<ul style="list-style-type: none"> <li>▶ Install sidewalks on both sides of SE 2<sup>nd</sup> Ave within segment 3 and fill sidewalk gaps on both sides within segment 37.</li> <li>▶ Upgrade existing and construct new pedestrian ramps at intersections where improvements are proposed or determined necessary (30x).</li> </ul>		
<b>Considerations &amp; Constraints:</b>	<ul style="list-style-type: none"> <li>▶ Identified on Key Route</li> <li>▶ No marked pedestrian crossings are provided within the project extents.</li> <li>▶ Adjacent land use predominantly consists of retail and residential</li> <li>▶ Transit stops are located along SE 3<sup>rd</sup> Street.</li> </ul>		
<b>Potential Funding Sources</b>	<p>State: Multimodal Active Transportation Fund, Statewide Transportation Improvement Program (STIP), All-Road Safety (ARTS) Program.</p> <p>City: COVID Relief funds, general transportation grant funding</p> <p>MPO: Carbon Reduction Program Funding</p>		

## 10: SE 2nd St Improvements: Graphic & Concept Illustration

The following image illustrates a concept design for the recommended improvements described above.



**Bend Pedestrian Implementation Plan**  
**SE 2nd St Improvements**  
 City of Bend



**Engineer's Conceptual Estimate**

Prepared By: Kittelson & Associates, Inc.			Date: June, 2023		
This Estimate has a Rating of:			<b>3C</b> (See rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST	
Mobilization	LS	ALL	\$48,000.00	\$48,000.00	
Traffic Control	LS	ALL	\$25,000.00	\$25,000.00	
Erosion Control	LS	ALL	\$4,000.00	\$4,000.00	
Construction Survey	LS	ALL	\$10,000.00	\$10,000.00	
Removal of Structures and Obstructions	LS	ALL	\$11,000.00	\$11,000.00	
Clearing and Grubbing	LS	ALL	\$10,000.00	\$10,000.00	
General Earthworks	CY	600	\$40.00	\$24,000.00	
Asphalt Roadway - Full Depth	SF	2,300	\$8.20	\$18,860.00	
Concrete Curbs - Standard Curb	LF	1,150	\$30.00	\$34,500.00	
Concrete Walks	SF	6,900	\$10.50	\$72,450.00	
Detectable Warnings	EA	30	\$500.00	\$15,000.00	
Pedestrian Ramps	EA	30	\$5,000.00	\$150,000.00	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$111,000.00	\$111,000.00	
Illumination System, Complete	LS	ALL	\$31,400.00	\$31,400.00	
<b>TOTAL CONSTRUCTION COST</b>				<b>\$</b>	<b>565,210</b>
<b>ENGINEERING SUPPORT</b>					
Design Engineering	LS	ALL	\$240,000.00	\$240,000.00	
Construction Engineering & Management	LS	ALL	\$114,000.00	\$114,000.00	
<b>TOTAL PROJECT SUBTOTAL</b>				<b>\$</b>	<b>919,210</b>
<b>50% Contingency</b>				<b>\$</b>	<b>459,610</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$</b>	<b>1,378,820</b>

**Assumptions:**

- No right-of-way impacts included
- New sidewalks assumed to be curb tight (no landscape buffer)
- New pedestrian ramps at Cleveland Ave (6x), McKinley Ave (8x), Roosevelt Ave (8x), Taft Ave (8x).
- Pedestrian ramps not included for private driveways
- Cost for private driveway not included
- Perpendicular pedestrian ramps assumed at intersection corners

**Scope Accuracy:**

**Level 1:** Project scope well understood and well defined.

**Level 2:** Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

**Level 3:** Project scope is a "vision" with limited detail.

**Engineering Effort:**

**Level A:** Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

**Level B:** Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

**Level C:** No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.