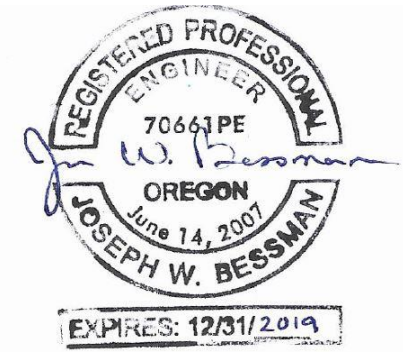
TRANSIGHT CONSULTING, LLC
Transportation Engineering and Planning Services

Date:	November 13, 2019
To:	Mike Reeder
From:	Joe Bessman, PE
Project Reference No.:	1363
Project Name:	Hawthorne Station Review



The purpose of this memorandum is to outline the results of our transportation engineering review of the safety, functionality, and viability of the current location of Cascades East Transit's (CET) Hawthorne Station.

EXECUTIVE SUMMARY

Since 2006 the City of Bend and Cascades East Transit (a division of Central Oregon Intergovernmental Council) have operated a local and regional bus system with local service operating as a "hub and spoke" system, with the Hawthorne Station as its hub. During this time the transit center has added and consolidated additional transit services and incrementally expanded its operations at this site, which is currently the only transit facility supporting bus staging and transfers in Bend.

As the regional need for transit service grows, pressure on the hub at Hawthorne Station will become more acute. This analysis concludes that the required transportation impact analysis was not conducted when the transit station was initially approved by the City of Bend; the station layout does not include the key design and layout elements that support a safe station; it is not fully ADA accessible along Hawthorne Avenue; it is located outside of a comfortable walking distance from the downtown; and based on discussions with adjacent businesses creates an undue burden on the adjacent commercial and single-family residential zones. The site itself is inadequate in location, size, and design to support expanded operations—a conclusion underscored by the transit center's use of City streets (a *Collector* and an *Arterial*) for the staging, loading and unloading of buses, which appears to be the only such station with this layout within the state of Oregon.

This report identifies the background process and decisions that followed the City's initial siting of the Hawthorne Station, including the lack of a transportation impact analysis when formally established; safety and design concerns of the facility; and recommendations for immediate and necessary resolutions to the safety, functionality and viability issues of Hawthorne Station.

Ultimately, I conclude that service in Bend has effectively outgrown this current location and new facility site(s) must be determined before transit operations can grow further. Based on field review and literature review of transit center siting and facility criteria, the following issues were identified surrounding the transit center and have formed the basis of this opinion:

- **The City of Bend approved Hawthorne Station without a transportation impact analysis of bus operations.** On May 4, 2010, COIC submitted a land-use application to convert the former Cascade Natural Gas building into administrative offices and a transit hub, but no analysis was conducted of the impact intermodal buses, local buses, taxis and other transit-related operations would have

on the surrounding transportation system and land-uses. The application describes the effect of the transit station as "negligible." The application was approved 20 days later by the City of Bend.

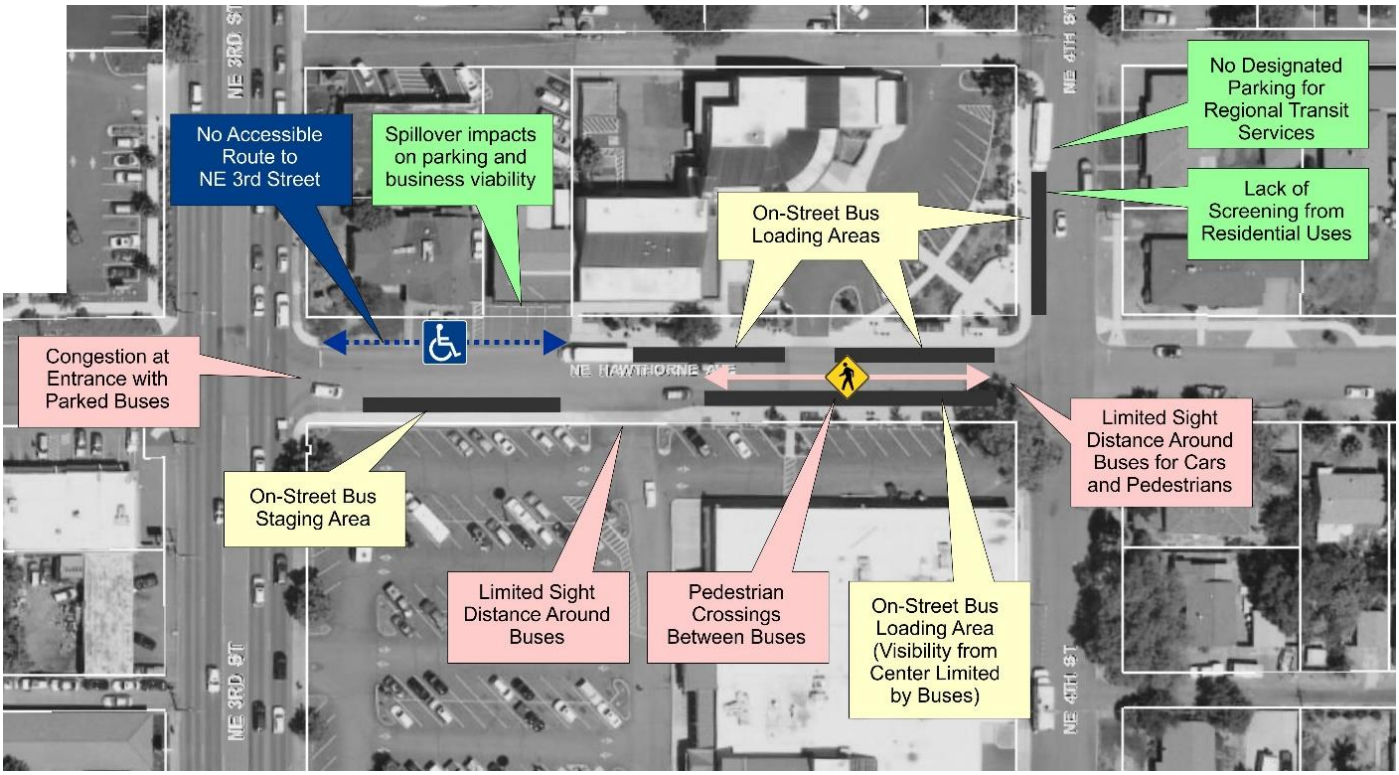


Figure 1. Safety, functionality and conflict-of-use issues at Hawthorne Station.

- **The .8-acre parcel hosting Hawthorne Station is not configured to allow operations on-site and must therefore rely on local streets.** The operations of the Hawthorne Station are reliant on Hawthorne Avenue and NE 4th Street, conflicting with their designated *Collector* and *Arterial* mobility role as higher-order streets and part of the City's grid roadway system, as well as their localized need to support the surrounding residential and commercial lands. This is highly unusual—no other such station can be identified in Oregon or elsewhere in the country. Overall this creates poor sight lines, and introduces pedestrian, bicycle and vehicular conflicts on Hawthorne Avenue.
- **Hawthorne Station is out of compliance with ODOT standards for transit stations.** In 2013, the Oregon Department of Transportation published *Transit in Small Cities*, which provides transit center design and safety guidelines to communities such as Bend. Hawthorne Station does not contain the key design elements identified by ODOT. Notably the site lacks clear sight lines throughout the facility, integration with separation of travel modes for safety, and completion of accessible routes surrounding the station.
- **Hawthorne Station is not fully ADA accessible.** The lack of sidewalks along the north side of Hawthorne Avenue west to NE 3rd Street does not support an accessible environment and results in pedestrians and disabled community members moving into the street to access the station or crossings between buses. The original land-use application for the transit station notes that the City was committed to completing this sidewalk network, but 10 years later this critical sidewalk connection has not been completed.
- **The number of crashes are elevated where the local streets serving Hawthorne Station connect to major roads.** Historical safety data shows an elevated number of crashes at major vehicular connection points onto the arterial system, even with the movement restrictions that are in place.

- **Hawthorne Station is adjacent to inappropriate zones.** The transit center is located on the border between *Standard Density Residential* and *General Commercial* zoning districts rather than within a higher density urban area. This creates a heavy burden on the single-family residents and nearby business owners. In the case of Bend Towne Center (Safeway), access to the shopping center's parking lot is in the center of a bus staging area, blocking sight lines, and mixing buses, delivery trucks, personal vehicles, bikes, and pedestrians in the same area, and interfering with deliveries and customer access. This issue is exacerbated by the limited access provided to the center onto Franklin Avenue and frequent congestion on 3rd Street. In the case of the Hutch's Bicycle Shop Annex and the High Mountain Mist Vape Shop on the north side of Hawthorne Avenue, head-in parking spots in front of the businesses cause vehicles to back directly into bus staging areas where pedestrians also navigate. These issues have led to turnover and vacancy in business uses in the area.
- **The station is distant from the urban core**. The current location of the "hub" of the CET transit system is over ¾ mile from the downtown core area and requires use of the Franklin or Greenwood undercrossings and a crossing of NE 3rd Street. Locations within or immediately adjacent to the downtown and along the Franklin Avenue corridor could significantly lessen this walking distance to keep this within a 5- to 10-minute trip (1/4 to 1/2 mile). The City of Bend existing Transportation System Plan calls for a transit station to be built in downtown, and a recent analysis by Kittelson and Associates, Inc. conducted as part of a CET 2040 Master Planning process also recommends a location closer to downtown or the Korpine site for the hub to better support integration of transit and land uses.
- **There is limited space on-site for park and ride.** While the site serves as a regional transit hub no long-term user parking was observed on-site for the regional transit services, including intermodal services such as Greyhound or The Breeze. Surface parking areas under COIC ownership is designated for COIC employees. Instead of parking on-site, riders park on nearby residential streets or within business parking lots.
- **Hawthorne Station does not remain open during all hours of operation.** For example, while there is access to the COIC building until 5:00 p.m., the buses complete their routes at 7:30 p.m. leaving no available facilities for patrons during the evening hours.

Based on my observations, the following near-term issues should be immediately implemented to improve facility safety and function:

- Elimination of on-street bus staging
- Completion of surrounding accessible routes as identified within the 2010 application
- Later building hours for restroom and waiting area access

These near-term measures, which are essential to the safety and functionality of the site, cannot accommodate the breadth of existing CET operations and anticipated growth. It appears there should be immediate further exploration of alternative sites that can accommodate the design and expansion needs of Bend and regional transit. These may include mobility hubs, which CET has identified as a critical component of an expanded service strategy, as well as a safe and adequate central transit hub.

As a critical modal service within Central Oregon and Bend these components of the CET 2040 Transit Master Plan should be integrated into the City's Transportation System Planning. A new central city transit center should conform with ODOT's siting criteria and should place the facility within closer proximity of the downtown core and higher density transit compatible uses.

TRANSIT CENTER BACKGROUND

This section presents background information on Hawthorne Station, including a timeline of its development, state siting guidelines, and findings within the ongoing CET 2040 Transit Master Planning process.

Timeline of Development

This section provides a timeline of the siting of Hawthorne Station as records could be obtained.

- In September 2006 the City of Bend launched a fixed-route transit system with six buses. The City designated the corner of NE 4th Street/Hawthorne Avenue as an enhanced bus stop ("Hawthorne Station)". No formal materials were identified by staff as to the siting of the location, but it appears that streetscape improvements were made and the right-of-way was re-designated for the transit use. It is unclear why this site was selected and limited documentation was available.
- In December 2007, the City applied to ODOT for a Connect Oregon II grant to build a regional transit hub at this site for $3.5M using the Cascade Natural Gas Building (inclusive of a $700,000 local match). The grant application described the available building features such as a "large parking area for customers, employees, and spare vehicles, a large maintenance bay, parts storage area, public restroom, staff restrooms/showers/lockers, office area, and on and off-street areas for loading platforms." The project noted that public agencies (the City of Bend) will require approval through the Community Development Department, but as a City sponsored project with Council support it was expected to receive approval. The submitted application and design, dated November 14, 2007 and prepared by Bend staff, included Bend Area Transit (BAT) bus stops along both sides of Hawthorne Avenue (see Figure 2).
- In June 2008 the Connect Oregon II grant was awarded to the City of Bend by ODOT. In a Bulletin article the City of Bend transit manager, Heather Ornelas stated, "This is a far-reaching project. It's really a regional project. It's an opportunity to connect services that are already available." Ornelas described the transit station as "one-stop shopping" that will serve as a central hub for taxis, airport shuttles, community shuttles, bike rentals, van pools and Bend Area Transit, noting that passengers could buy tickets for a wide variety of services.
- By December 2008 (during the recession) the City became worried that they did not have the ability to secure the matching funds (now shown as $554,000) that ODOT required to be able to use the grant. A public ballot measure to fund public transit was defeated and the City was in its third round of budget cuts. It was suggested that the City partner with COIC, who was already operating the regional Cascades East Transit, to take over local Bend operations.
- In February 2009, the City and COIC reached a deal for COIC to acquire the transit service and obtain the grant proceeds in exchange for providing the local match. In a Bulletin article written at the time, the City of Bend transit manager Ornelas stated, "And there can be longer-range benefits, too: a rental center for cars, a phone bank for travelers coming in being able to contact area hotels, we'll have a cab stand, a van pool location and then all the inner-city buses coming through." This statement was consistent with the grant application materials.

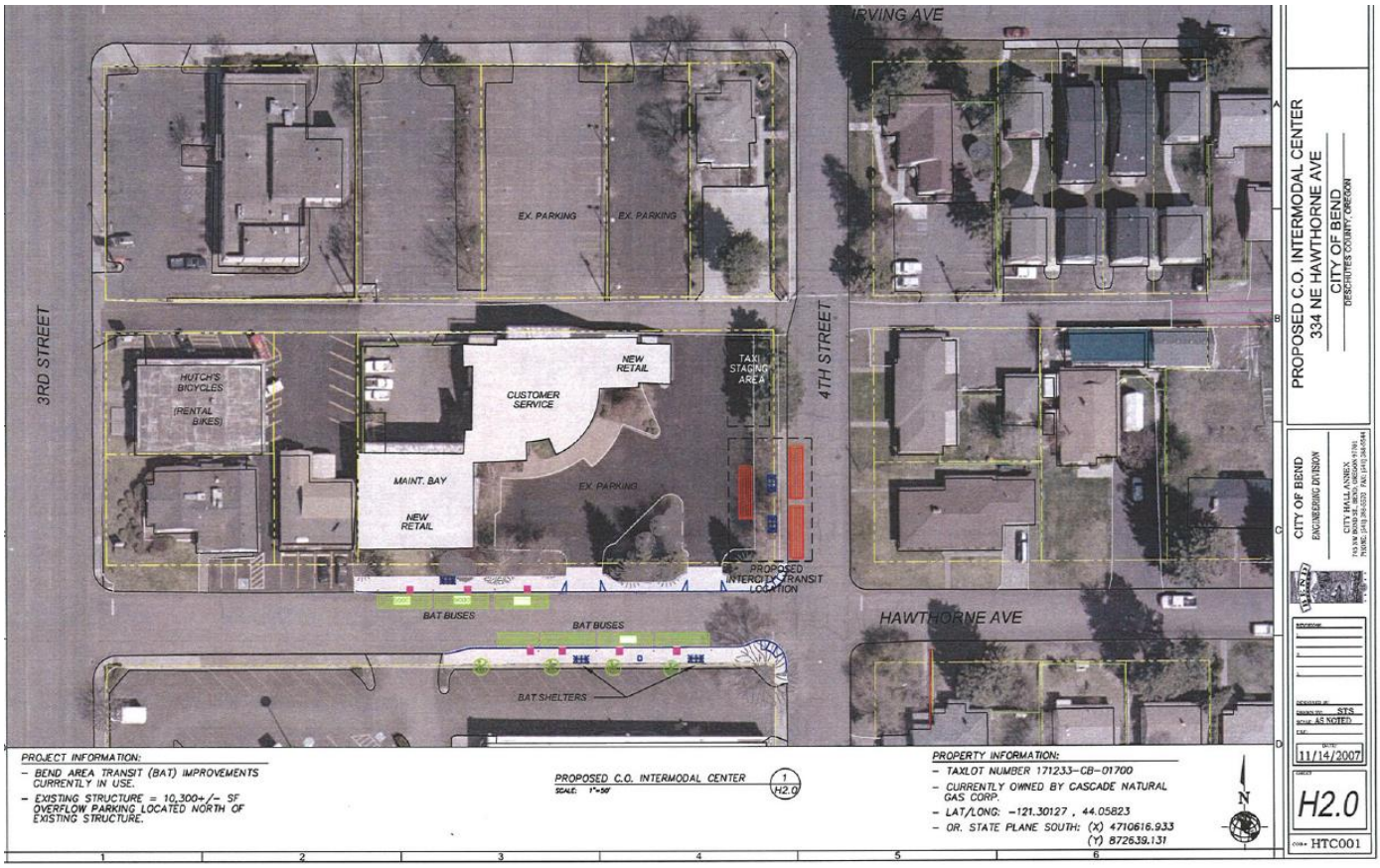


Figure 2. Layout of the Hawthorne Station in the Grant Application as prepared by Bend staff.

- In March 2009, the City of Bend transferred the grant to COIC so it could build the transit station within the Cascade Natural Gas building. In an article from The Bulletin written at this time, Ornelas stated, "The City really is not losing out. We're losing the grant dollars and ownership of a property, but we're going to get the benefits. We're going to get an intermodal center operating right by where we operate all our routes, which encourages customers to flow from one provider to another, to an intercity bus line to our (bus) line to a taxi."
- A subsequent Bulletin article from December 2009 cites the COIC executive director Karen Friend as saying they are close to the purchase of the Cascade Natural Gas building. Ornelas, the Bend transit manager responsible for managing the BAT system stated, "I think what is happening in public transportation throughout this region is significant, but it's been creeping up slowly, and maybe people haven't been aware. Four years ago, there was no fixed-route system in Bend. This brings one other piece to that whole regional transit solutions puzzle, that is connecting all the bus lines, getting them all coordinated through a central transfer point." At the time, many of the regional bus lines were operating their Bend stop out of various hotel parking areas.
- On May 4, 2010, COIC submitted the required land use application to the City of Bend to convert the Cascade Natural Gas building into a transit station as part of PZ 10-116 (the only identified land use application for the site), with COIC listed as applicant. The application requested a Change of Use to allow a publicly owned transit center with accessory offices, future retail/lease space, an expansion of 860 square-free, a new entry and elevator. But though the application describes the new use as a transit center, the application doesn't identify or consider the actual operations of the multimodal center. Specifically, no transportation impact analysis of operating buses, a taxi stand, or park and ride needs on local streets adjacent to single family residential and commercial zones was conducted.

- An analysis of the submitted land use application demonstrates:
    - The overall burden of proof provided in the application considered the Cascade Natural Gas building's conversion to offices and a waiting area for transit but did not account for the then-current multimodal center operations. It was generally stated that the new use will have less "active" office space with the lobby areas and so will generate fewer trips than the previous use as the Cascade Natural Gas building. The report states, "As compared to the previous office use, the transportation impacts associated with the proposed use will be negligible…"
    - The application materials also stated that through a separately awarded grant the City would be completing sidewalks on the north side of Hawthorne Avenue west of the transit center to NE 3rd Street. This infrastructure has not yet been completed.
    - On-site parking requirements were only based on the office square-footage, and in no way accounted for the multimodal transit services that were being consolidated regionally. There was no mention of the various services as included in the Connect Oregon grant application or cited by the City of Bend transit manager in The Bulletin. The narrative does not account for CET buses on Hawthorne Avenue or regional transit on NE 4th Street, nor does it account for taxi or other rideshare services.
    - Even without an account of the actual services, the application showed more than 100 daily trips and per City Code required a Transportation Impact Analysis, yet this analysis was not prepared.
    - The application states that all clear vision areas from driveways are available and will be maintained. This did not account for the on-street bus staging and parking that blocks the sight lines from the Hawthorne Station property and the adjoining businesses.
    - While no traffic study was prepared, the staff report states that "the application includes a detailed traffic analysis of the proposed new intermodal center. Comments from the City Transportation Engineer states that there are no issues or concerns with the proposed application with the exception of the need for [four] long-term, secure bicycle parking facilities."

The history of the site shows that this location was selected by City staff as the location for the transit "hub" with little public involvement and without a land use process. This use was expanded when grant funding through Connect Oregon became available, but the impact was never assessed for its intended and current use. In fact, the siting and design of the facility conflicts with the functional classification of NE 4th Street and NE Hawthorne Avenue, which are classified as a *Minor Arterial* and *Major Collector* respectively. More will be noted about the limitations of the surrounding roadway characteristics further below, but the balance of information demonstrates that there were limitations with the selected site since its inception that prevent it from supporting transit as intended.

ODOT Guidelines for Small City Transit Stations

Research was conducted to compare the Hawthorne Station to national design practice. The most relevant reference identified is a recent publication prepared by ODOT through the Transportation and Growth Management department in 2013 titled *Transit in Small Cities*. This reference provides various design elements and siting criteria for transit centers. Within the siting and design criteria, the following are identified as "key" elements:

- Sheltered waiting area with seating and/or an enclosed lobby within a building. Clear sight lines are important between the waiting area and bus loading area for the safety of patrons.
- A defined area for passengers to load on and off buses.

- A bus staging, or parking area, separate from the loading area.
- Separation of pedestrian walkways from other modes to avoid conflicts.
- ADA accessibility integrated throughout facility.

The current location and facility layout does not provide any of these key facility elements; the dispersed loading areas are not visible from the station (especially behind parked buses), the passenger area is co-mingled with public sidewalks along the retail frontage, the bus staging area is problematic in that it blocks the adjacent Bend Towne Center driveway and other business sight lines, pedestrians are intermixed with public street traffic and result in crossing between buses, and ADA access is not present from the station to NE 3rd Street.

COIC's recent 2017 construction of the Redmond Transit Center did, however, employ the majority of these key design elements. The layout of the location on Kalama Avenue, as shown in Figure 3, shows how the site separates buses from parked vehicles and provides a building with clear sight lines to the waiting platforms. This also shows high visibility crosswalks connecting the passenger vehicle parking with the bus platforms. This layout highlights appropriate transit center design principles that can be provided as part of capital projects.

Figure 3. COIC's Redmond Transit Center Layout Employing ODOT Design Principles.

Review of other park and ride and transit center locations was also conducted. Throughout the locations in Portland, Vancouver, Salem, Eugene and Medford that were reviewed there were no facilities identified that similarly rely on both sides of a public street system (particularly one designated as a *Collector*) for transit operations.

Planning Considerations for the Future of Transit Facilities

The City of Bend and Cascades East Transit are currently developing and updating long-range transportation plans. The City of Bend and CET have both identified mobility hubs as a critical component of a transit system integrated within the overarching transportation system, but the location of these hubs is undetermined. CET's planning process has also recognized the limitations with Hawthorne Station, with a September 13, 2019, Need Analysis Supplemental Memorandum prepared by Kittelson and Associations, Inc. noting the following disadvantages and offering two options for moving forward:

- Hawthorne Station is:
    - Beyond comfortable walking distance to downtown destinations (.75 miles or more) and lacks significant transit demand generators in close proximity, which lead to a high rate of transfers in the CET Bend fixed-route system.
    - Adjacent street environment along 3rd Street is not particularly pedestrian-friendly or conducive to walking
    - Congestion on 3rd Street can delay transit vehicles and 4th Street is narrow and not optimal for transit vehicles.
    - Capacity to support future expansion is limited.
- Option 1: Relocate the transit center, maintaining an eastside location (assume vicinity of Hawthorne Avenue between Bend Parkway and 3rd street/US 97 Business.
- Option 2: A westside transit center in close proximity to downtown and/or the Old Mill District; generally, in the vicinity of Colorado/Arizona between Bend Parkway and the Bond/Wall couplet.

See full text of memo related to new siting of transit station below.

TRANSIT CENTER LOCATION IMPLICATIONS

Hawthorne Station, the current transit center in Bend for the CET system with connections to intercity services outside of the CET service area, is a relatively new facility owned by COIC, with restrooms and an indoor passenger waiting area. It serves local, Community Connector, and longer-distance intercity services and is an effective hub for routes serving Bend's eastside. However, it has disadvantages including:

- Beyond comfortable walking distance to downtown destinations (0.75 miles or more) and lacks significant transit demand generators in close proximity, which lead to a high rate of transfers in the CET Bend fixed-route system.
- Adjacent street environment along 3rd Street is not particularly pedestrian-friendly or conducive to walking (although these conditions have and are likely to continue to improve)
- Congestion on 3rd Street can delay transit vehicles and 4th Street is narrow and not optimal for transit vehicles.
- Capacity to support future expansion is limited.

Table 5 below provides a high-level qualitative assessment of two conceptual options to replace Hawthorne Station and implications for connections between the eastside and downtown Bend. The assessment does not consider interlining or other routing strategies, which could be employed irrespective of the transit center location.

Option 1: Relocate the transit center, maintaining an eastside location (assume vicinity of Hawthorne Ave between Bend Parkway and 3rd Street/US 97 Business, ideally in conjunction with a Hawthorne Avenue bike/pedestrian crossing under the Bend Parkway as proposed in the Bend Transportation System Plan (TSP).

- A new bike/pedestrian crossing under the Bend Parkway would provide a more direct, pedestrian and bicycle-friendly connection to downtown from an eastside transit center.
- Routes 1, 4, 5, 6, and 7 do not provide a direct connection between the eastside and downtown (similar to today).
- Routes 2, 3, 10, and 11 continue to provide a direct connection between the eastside and downtown (similar to today).
- Community Connector routes do not provide a direct connection to downtown.

Option 2: A westside transit center in close proximity to downtown and/or the Old Mill District; generally, in the vicinity of Colorado/Arizona between Bend Parkway and the Bond/Wall couplet. One or more mobility hubs in the central eastside could be created to facilitate transfers between routes.

- Routes 1, 4, 5, and 6 could be redesigned to provide a direct connection to downtown; this might increase travel times for some passenger currently traveling on the east side of the Bend Parkway.
- Route 7 could logically be extended to serve a westside transit center, likely primarily benefiting existing riders.
- Routes 2, 3, 10, and 11, which currently cross the Bend Parkway, would likely end at the westside transit center. Passengers wishing to travel between the westside and eastside would need to transfer; however, most of these passengers likely need to do so today as well.

- Community Connector routes would be able to provide more direct service to downtown; however, similar to today, passengers traveling to other destinations would likely need to transfer.

Table 5: Transit Center Implications

Area / Corridor	Option 1: Relocate Transit Center - Maintain Eastside Location	Option 2: Relocate Transit Center to a Westside Location
Local Fixed-Routes		
1 – South 3rd St	▶ Does not provide direct access to downtown area	▶ Could provide direct access to downtown area
2 – Brookswood	▶ Currently routed through downtown (no change from today)	▶ Would require a transfer to access eastside destinations beyond the central eastside (similar to today).
3 – Newport	▶ Currently routed through north end of downtown (no change from today)	▶ Would require a transfer to access eastside destinations beyond the central eastside (similar to today).
4 – North 3rd St	▶ Does not provide direct access to downtown area (no change from today)	▶ Could provide direct access to downtown area
5 – Well Acres	▶ Does not provide direct access to downtown area (no change from today)	▶ Could provide direct access to downtown area
6 – Reed Market	▶ Does not provide direct access to downtown area (no change from today)	▶ Could provide direct access to downtown area
7 – Greenwood	▶ Does not provide direct access to downtown area (no change from today)	▶ Could provide direct access to downtown area
10 – Colorado	▶ Currently routed through downtown (no change from today)	▶ Would require a transfer to access eastside destinations beyond the central eastside (similar to today).
11 – Galveston	▶ Currently routed through downtown (no change from today)	▶ Would require a transfer to access eastside destinations beyond the central eastside (similar to today).
Community Connector		
North: Redmond (24), Madras (22), Prineville (26), Sisters (28/29), Warm Springs (20)	▶ Does not provide direct access to downtown area	▶ Would provide more direct access to downtown destinations.
South: La Pine (30)	▶ Does not provide direct access to downtown area	▶ Would provide more direct access to downtown destinations.

Note: Shaded cells indicate routes where a westside transit center would provide the potential for direct access to downtown.

EXISTING HAWTHORNE STATION CHARACTERISTICS

This section describes the current site, highlighting land use context, demonstrating conflicts with the roadway designations and adopted Bend Central District roadway standards, and illustrating the current zoning designations.

Site Context

The Hawthorne Station is located on an approximately 0.80-acre parcel at 334 NE Hawthorne Avenue, Bend, OR 97701, tax lot 171233CB01700, as shown in Figure 3. Because of the small size and layout of the parcel, all bus loading and staging occurs on the collector and arterial streets that are adjacent to the transit station.

The parcel is approximately 250 feet east of the NE 3rd Street corridor and one block north of the NE Franklin Avenue corridor. The parcel is shared with Central Oregon Intergovernmental Council's (COIC) administration offices, with the transit center occupying approximately half an acre within the overall property.

Figure 4 illustrates the location of the property and the general service areas that surround it, and Figure 5 illustrates the surrounding zoning designations, and street functional classifications surrounding the property are summarized in Table 1.

Figure 4. Site Vicinity Map. *Aerial Source: Deschutes County Property Information, DIAL)*

Adjacent Land Uses and Surrounding Roadway Characteristics

In its current layout the Hawthorne Station is ill-suited to its location in large part due to its conflict with nearby land uses and transportation needs along the surrounding roadways, upon which the station relies for the entirety of its busing operations.

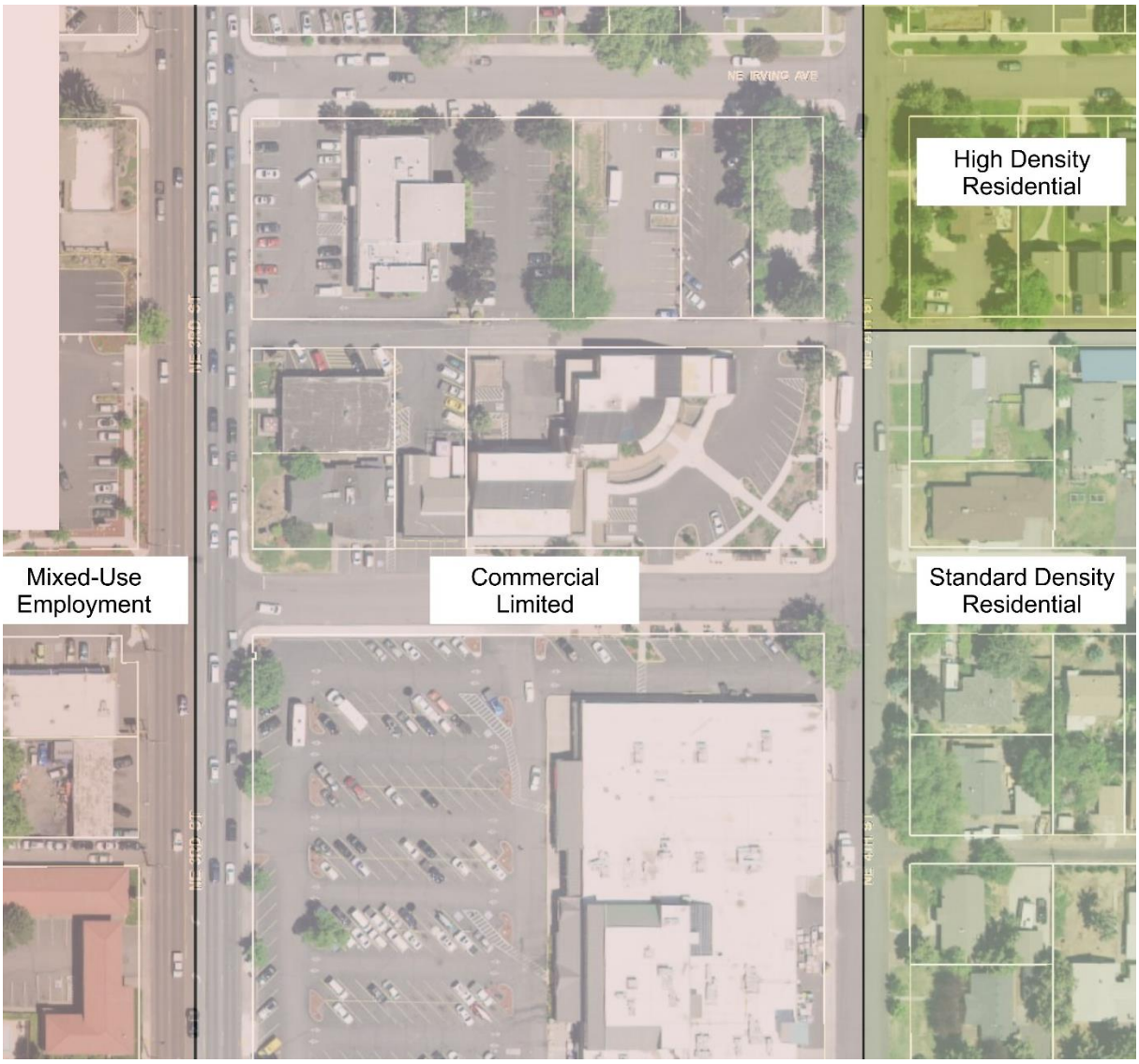


Figure 5. Surrounding Zoning Districts. *Aerial Source: Deschutes County Property Information, DIAL)*

The site of the Hawthorne Transit Center is at the boundary of *Commercial Limited* and *Standard Density Residential* zoning. Immediately west of the transit center is the former Hutch's Bicycle Shop annex, the High Mountain Mist vape store, and Hutch's Bicycle Shop. A Wells Fargo branch is located to the north separated from the site by an alley, and COIC staff parking lots are located east of the bank. A denture business (Denture In) is located to the north along the alley east of the COIC parking. The most prominent development in the area is the Bend Towne Center, which is anchored by Safeway and Ace Hardware, and is located directly south of the Hawthorne Station with access to Bend Towne Center located between bus staging and loading areas. Juniper Park is located approximately one block east with the direct access into the park provided from the terminus of Hawthorne Avenue. On the west side of 3rd Street are various motels and fast food restaurants.

In addition to the commercial uses that are north and south of the transit center there are single-family residential uses directly across NE 4th Street. The layout of the transit center is oriented toward the residences, and the bus stops along NE 4th Street are directly opposite the lower-density residential uses with no screening or vegetation to buffer between these generally incompatible uses.

While NE 4th Street is designated as a *Major Arterial* (the same designation as Franklin Avenue) the streetscape, connections, and even the adopted cross-section design does not support this classification's level of mobility or connectivity. Arterials are intended to support a high level of vehicular mobility; they require striped on-street bicycle lanes and do not allow on-street parking, and most forms of traffic calming would be discouraged.

Despite this, NE 4th Street is identified for additional narrowing treatments per the adopted Bend Central District Special Planned District street standards as separately discussed. When implemented, this will make it even more difficult for buses (and trucks serving the commercial areas) to navigate these streets.

NE Hawthorne Avenue is designated as a *Major Collector,* similar to Bond Street through the Old Mill and downtown area. Again, this is an aspirational designation and poses conflicts with the transit station as the level of throughput contemplated with this *Major Collector* designation is not possible with the streetscape design and bus loading.

Table 1. Roadway Functional Classification

Street	Functional Classification
NE 3rd Street	Principal Arterial
NE 4th Street	Minor Arterial
NE Hawthorne Avenue	Major Collector

Site Connectivity

A critical aspect of a transit center is its connectivity with the pedestrian and cycling system. Major destinations within the area include Juniper Park, Bend High School, the downtown core area, and the major arterial and collector corridors. The following was observed:

- The site is 2,300 feet from the Franklin Avenue undercrossing and 4,100 feet from the downtown core (Bond Street). Access constraints along this route includes the lack of sidewalks on the north side of Hawthorne Avenue to connect to NE 3rd Street and the current design of the Franklin Undercrossing.
- Cycling routes to the downtown core are also limited by the Franklin undercrossing design and high cycling stress levels along the 3rd Street corridor. Use of NE 4th Street provides more comfortable north-south travel to Franklin Avenue or the Greenwood Avenue corridor, but access west on Greenwood into the downtown would require "wrong-way" riding to the traffic signal due to the difficulty of crossing the corridor.
- Complete sidewalks are available to Juniper Park, with a complete sidewalk system in place connecting into the park's trail system.
- Connections are also provided to Bend High School through use of BPRD's trails through Juniper Park and existing marked crosswalks on Franklin Avenue.
- A complete sidewalk system is provided on the west side of NE 4th Street to the US 20 corridor and south to Franklin Avenue.

NE 4th Street

NE 4th Street is classified as a *Minor Arterial* with the goal of providing a parallel route to NE 3rd Street. The facility was designed and built as a local street. This road includes a 29-foot paved width that widens

to 36-feet along the Hawthorne Station to support the regional on-street bus parking and loading area, as shown in Figure 6. The road is designated as a *Minor Arterial* but has distinct design standards that were recently adopted within City Code that mimic those of a local street.

Complete sidewalks are provided along the west side of NE 4th Street between Franklin Avenue and Greenwood Avenue. The City recently added "Sharrows" to this road to support a lower-stress alternative for cyclists than the parallel 3rd Street corridor (see Figure 6), but this provides a lesser standard than on-street bicycle lanes that are required for all collector and arterial roadways. Movements at the connection of NE 4th Street with Greenwood Avenue are limited to right-turns, so with these restrictions the roadway traffic volumes are fairly low despite the length of the roadway and its functional designation.

When the Hawthorne Station was formally approved in 2010 the alternative street section for NE 4th Street was not yet adopted. Figure 7 illustrates a typical *Minor Arterial* and Figure 8 illustrates the revised cross-section that was adopted within the Bend Central District Special Planned District. This revised cross-section is nearly identical to the City's *Local Street* standards, indicating no desire to fulfill the roadway's designated mobility function, yet no efforts by the City to modify the roadway classification as is now necessary.

Figure 6. NE 4th Street Cross-Section (Facing North).

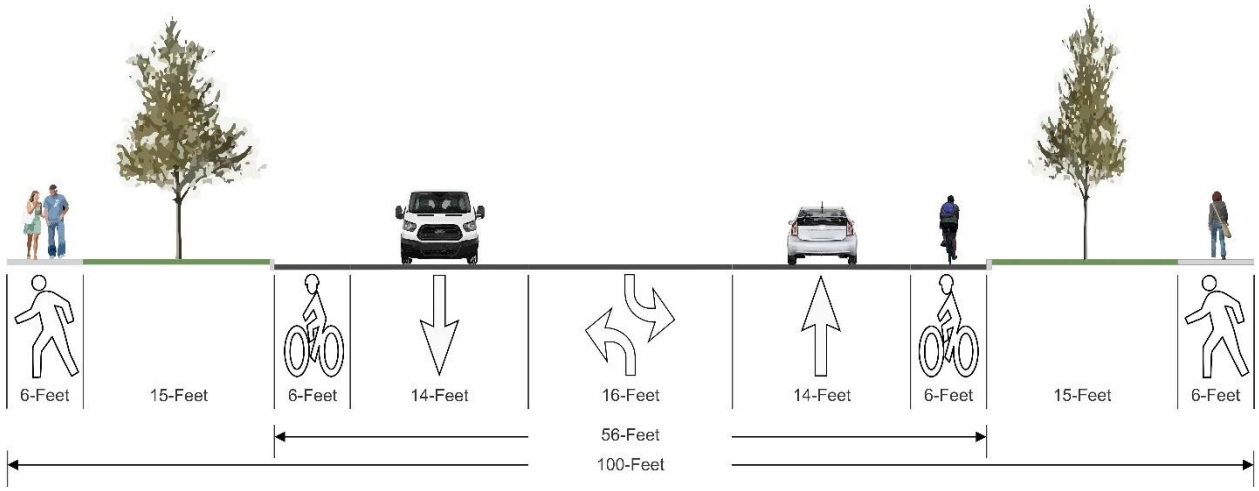


Figure 7. Standard City of Bend *Minor Arterial* (As originally designated for NE 4th Street)

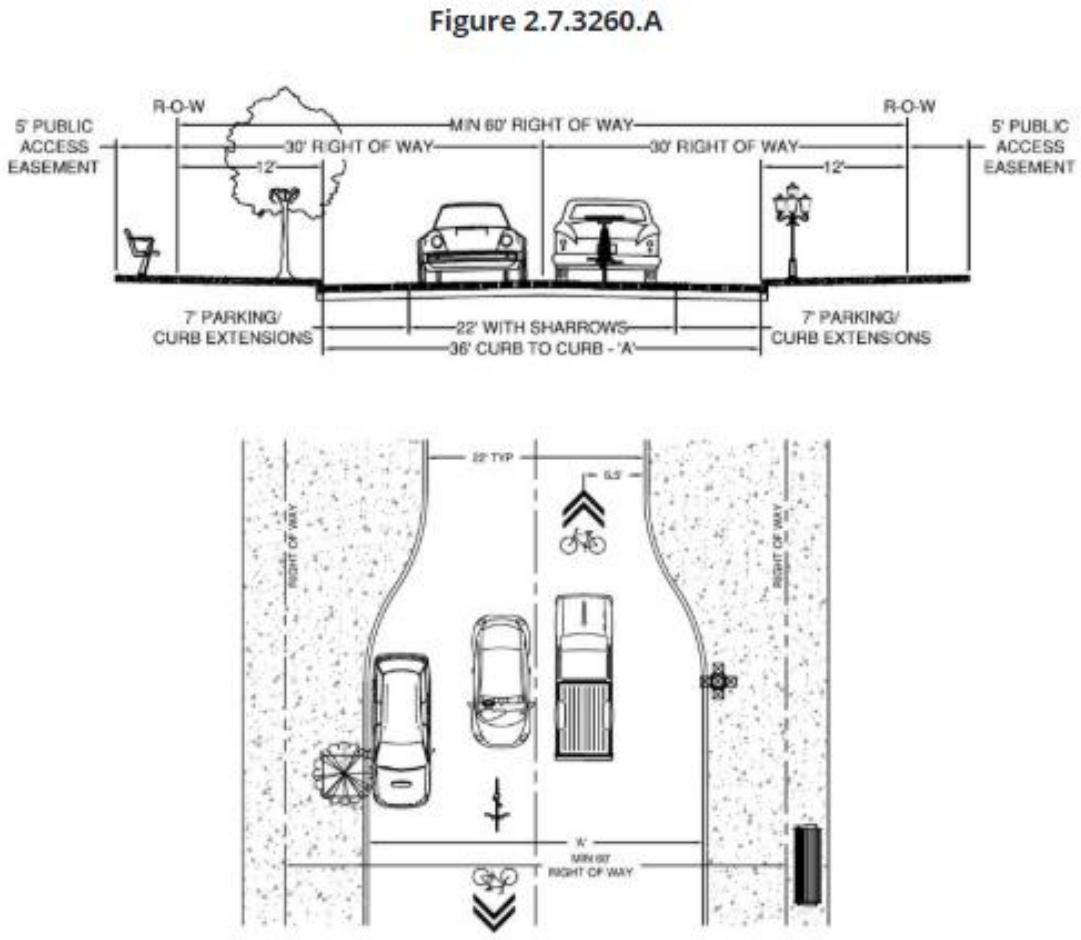


Figure 8. Adopted NE 4th Street roadway cross-section within Bend Central District Special Planned District. *Source: Bend Development Code 2.7.3260.*

NE Hawthorne Avenue

Currently, NE Hawthorne Avenue is a public local street containing a pavement width of 32-feet along the Hawthorne Station frontage, which widens to a standard 36-foot width toward the west where no public parking is allowed. Public on-street parking is also precluded on-street east of the Safeway entrance to maintain this parking for buses.

Sidewalks along Hawthorne Avenue are complete along the south side of the road to NE 3rd Street adjacent to the Bend Towne Center but are not provided along the transit center frontage (see Figure 9). On the north side of the street there is head-in parking for businesses and the sidewalks are discontinued. This design creates an extended conflict area for pedestrians, requires that drivers backing out of the stalls clear the buses before obtaining clear views along the street. This design also requires that pedestrians walk in the roadway or through the vape shop landscape area to access the transit center from the NE 3rd Street corridor. Field observation showed a transit center patron in a wheelchair that used the street, and when they entered the sidewalk system at the west end of the property they had to relocate a construction sign that had been placed across the entire sidewalk width.

Figure 9. NE Hawthorne Avenue Streetscape.

With transit platforms provided on both sides of Hawthorne Avenue there is approximately a 14-foot roadway width remaining, which is less than the 20-foot minimum width for two-way travel (24-feet is standard for two-way travel). This makes it very difficult to maneuver through the center, which is also where pedestrians are making their way through the traffic to cross the street as they exit the southern platform to access the building, taxi area, or northern transit platforms. Figure 10 illustrates the current streetscape.

There are no special street standards adopted within the Bend Central District for NE Hawthorne Avenue, and so per City and State policy this road should include striped on-street bicycle lanes, property tight sidewalks, a three-lane cross-section, and preclude on-street parking, as shown in the standard *Major Collector* design within Figure 11.

Figure 10. Current NE Hawthorne Avenue Streetscape.

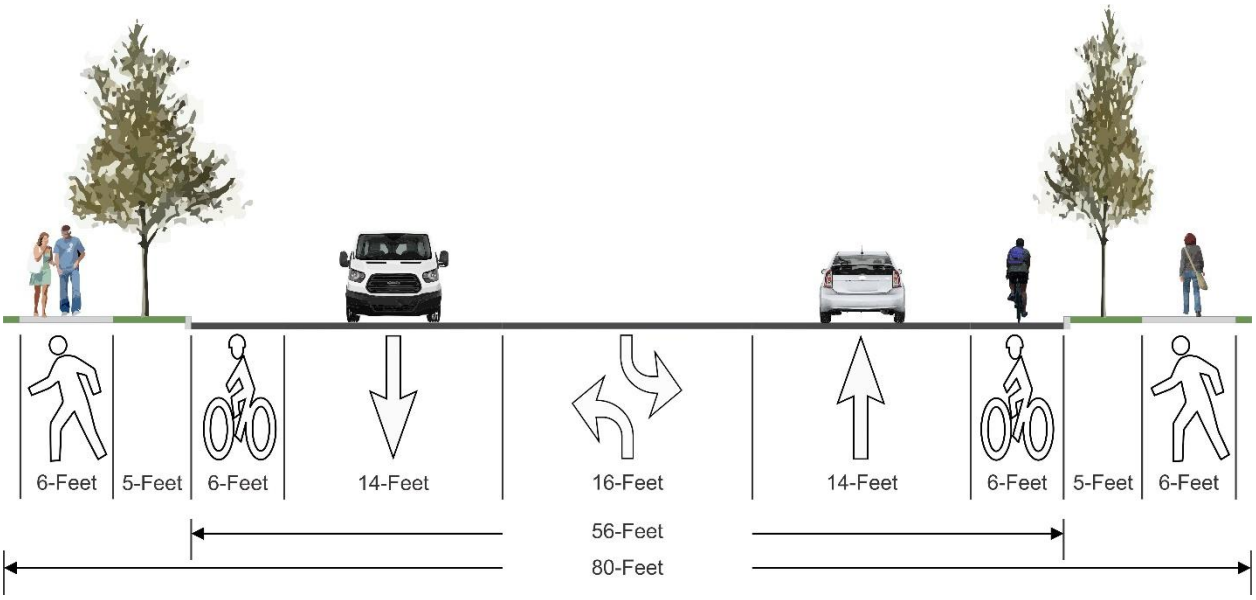


Figure 11. Standard City of Bend *Major Collector* (Applicable section for NE Hawthorne Avenue).

Hawthorne Station Operations

The transit center relies on its location within the Central Business District for all of its routes. The entire CET fixed-route bus system converges along NE Hawthorne Avenue as the "hub," then radiates out along the 3rd and 4th Street corridors to access the major roadway corridors that surround the transit center (Franklin Avenue, Greenwood Avenue, and 3rd Street).

The transit center operations rely on bus service along both sides of Hawthorne Avenue and the west side of NE 4th Street. The on-site parking is designated for taxis, although very low utilization of this space was observed during the field review (it appeared that as many as three vehicles were parked in these stalls during the field review). On site, the station offers a lobby with restrooms and vending machines.

The site includes a one-way circulation pattern, with the parking lot entrance located on the mid-block alley between NE 3rd Street and NE 4th Street as shown in Figure 12. The site exits south onto Hawthorne Avenue between two bus stops. There are 13 on-site parking stalls including two ADA designated stalls that are intended to serve short-term taxis and shuttles. COIC staff are provided additional parking north of the alley. Throughout the site there are a combined total of seven covered shelters with benches along the north and south side of Hawthorne Avenue and the west side of 4th Street, and various other low walls and benches within the southeast corner of the site.

There is no on-site parking for buses; all transit stops are located along both sides of Hawthorne Avenue and the west side of NE 4th Street. Bus stops along Hawthorne Avenue serve the City of Bend fixed transit routes, while the stops along NE 4th Street are dedicated to inter-city routes. Figure 12 also shows the general layout of the site and areas used for parking and loading.

Figure 12. View facing west along Hawthorne Avenue showing typical on-street parking.

A review of the bus schedules shows that buses are in operation at the Hawthorne Transit Station weekdays beginning at 6:00 a.m., with the latest drop-off at the station occurring at 7:30 p.m. Throughout the day buses return to the station and park, awaiting their next scheduled route.

With the schedules outlined online the percentage of time parked for each bus ranges from 19% to 67% of the service time, with buses parked at the station for an average of 35% of the day. Headway times for the various routes alternate, but throughout the day there are times in which schedules converge increasing the number of on-site buses. These peak times occur approximately every hour and a half beginning at 6:00 a.m. This allows more efficient transfers between routes but produces a higher volume of parked buses along Hawthorne Avenue with more impacts to adjacent uses, pedestrian crossing demands, and pedestrian conflicts with the provided design. Table 2 and Figure 13 summarize bus operations at the Hawthorne Station excluding regional routes; the purpose is to highlight how bus arrival patterns vary throughout the day with multiple arrivals and departures in any given hour.

Table 2. City of Bend Weekday Fixed-Route Transit Routes, Parking Percentages

Route Number	Time Spent Enroute (min)	Time Spent Parked (min)	% of Time Parked
1	486	312	39%
2	584	228	28%
3	567	234	29%
4	594	208	26%
5	594	219	27%
6	594	219	27%
7	648	156	19%
10	247	492	67%
11	350	455	57%

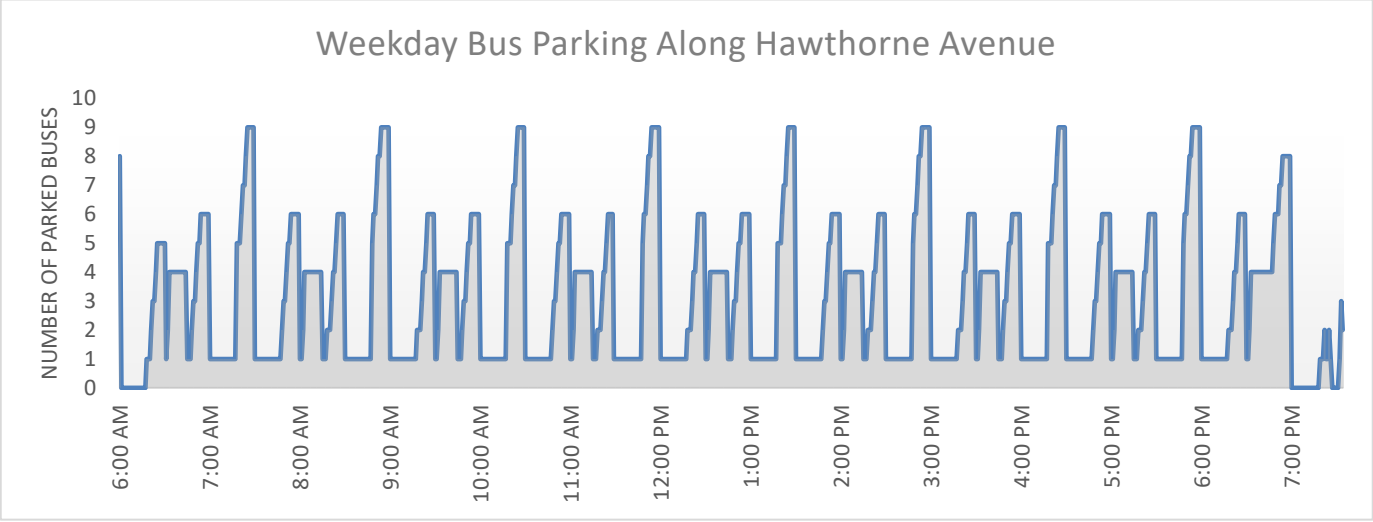


Figure 13. Weekday Bus Storage Volumes at Hawthorne Station.

SAFETY REVIEW

The safety review was conducted through review of historical crash information and field observations. Each of these are described below.

Historical Crash Data

A safety review was conducted that included historical crash information as maintained by ODOT Crash Analysis and Reporting unit, and this review was supplemented with field review. The historical crash records include all reported crashes between January 2013 and December 2017. Crashes required for reporting during this period include those involving any level of personal injury or property damage exceeding $1,500. This information can be helpful in identifying trends but is not a complete representation of all the crashes nor is it reflective of recent area or operational changes. Table 3 provides an overall summary of the crash experience, additional details on each location are presented below.

Table 3. Intersection Crash History (January 2013 through December 2017)

Intersection	# of Crashes	Severity		Crash Type				
		Injury	Non-Injury	Angle	Sideswipe	Rear-End	Turning Movement	Other
NE Greenwood Ave/ NE 4th Street	17	12	5	8	1	5	2	1 *Pedestrian*
NE 4th Street/ NE Irving Avenue	4	1	3	2	1	0	1	0
NE 3rd Street/ NE Hawthorne Ave	21	10	11	2	2	11	4	2 *Fixed-object*
NE 4th Street/ NE Hawthorne Ave	0	0	0	0	0	0	0	0
NE 3rd Street/ NE Franklin Ave	51	23	28	3	3	30	13	2 *Pedestrian*
NE 4th Street/ NE Franklin Avenue	9	4	5	4	0	2	3	0

The historical crash patterns show high total number of crashes throughout this review period near Hawthorne Station. The intersection of NE 3rd Street/NE Franklin Avenue had the highest number of crashes, most of which were rear-end collisions. This is expected on a high-volume corridor that experiences heavy commute patterns and congestion as one of the primary portals to the downtown core area. Over the past five years the City has implemented various geometric and striping changes at this intersection to improve pedestrian and cyclist visibility.

However, the NE 3rd Street/NE Hawthorne Avenue intersection contains a very high number of crashes for a lower-volume unsignalized intersection. Much of this is due to the “back of queue” crashes that are occurring near the intersection but are likely associated with the Franklin Avenue or Greenwood Avenue traffic signals. The reported turning and angle collisions (which are most likely to be associated with stop sign control) comprise six of the total crashes. The crash patterns have remained fairly consistent over the past five years, with approximately five total crashes experienced annually.

The City recently completed a pedestrian crossing project on the south side of the intersection that removes the northbound left-turn lane and replaces this space with a pedestrian refuge island, as shown

in Figure 14. Without completion of the sidewalk system on the north side of Hawthorne Avenue this will either require that pedestrians walk in the street or stay on the Bend Towne Center sidewalks and cross by the parked buses. While our team recognizes the importance of NE 3rd Street crossings the missing sidewalks that are immediately adjacent to the site should also be a very high priority.

Figure 14. NE 3rd Street/Hawthorne Avenue intersection.

Similar to conditions within the crash reports, it was noted that northbound queuing along NE 3rd Street extended beyond the Hawthorne Avenue intersection during limited portions of the Greenwood Avenue signal cycle.

As noted previously, the primary safety concern observed in the area is the dangerous lack of sight lines around the buses. Unlike passenger cars that are parked on the street, the size of the buses prevents motorists from viewing approaching pedestrians, cyclists, and vehicles around, over, or through the vehicles, increasing the risk of crashes.

The on-street parking for staging and loading of buses on both sides of Bend Towne Center's Hawthorne Avenue access, and immediately adjacent to the vape shop and annex building access make these parking maneuvers constrained, also increasing the risk of crashes. The incomplete sidewalk system and lack of an accessible route from the transit center to 3rd Street increases mid-block pedestrian crossings, and the operations of the transit center on the public street system adds additional conflicts that limit the ability to use these roads.

Field Review

Field observations occurred in October and November 2013 during fair weather conditions. A summary of the observations and findings is presented below.

Figure 15. Hawthorne Avenue activity and congestion.

- The Hawthorne Avenue access to the Bend Towne Center is significantly impacted by the staging and loading buses. Public on-street parking is prohibited east of the access to reserve this area for buses, but the bus staging area was observed extending west of the access as well. This makes it more difficult to enter and exit the site as motorists are unable to obtain clear views around the buses.
- The internal circulation within the transit center is designated for one-way travel southbound. This forces any taxis that park on-site to pull onto NE Hawthorne Avenue between the platforms and parked buses, adding to inconsistent and unpredictable vehicular movements that increase safety risks at the station.

- The southern Bend Towne Center access onto Franklin Avenue is very constrained with only right-in, right-out only movements allowed. An alternate access is provided to the east, but the proximity to NE 4th Street makes this access less functional. This increases the burden on NE Hawthorne Avenue to support the retail uses.
- The 3rd Street entrances to the Bend Towne Center can be limited by queuing and congestion on NE 3rd Street. During the site visit there were periods when the queues at the 3rd Street/Greenwood Avenue intersection extended south beyond Hawthorne Avenue and to the northern site driveway.
- Westbound buses made it more difficult for eastbound trips to access NE Hawthorne Avenue around the parked buses.
- The head-in parking for the vape shop and adjacent building and lack of sidewalks along Hawthorne west of the transit station create an extended conflict area for pedestrians along the north side of Hawthorne Avenue. This design is inappropriate adjacent to a transit center where an accessible environment is critical. This design forces users onto the south side of Hawthorne Avenue, into the street itself, or to walk through the retail parking areas as was observed. With the parked buses and delivery vehicles there was substantial congestion observed for a period of time. Access to the businesses is highly constrained, particularly for any backing maneuvers next to the parked buses. These factors create a highly unsafe environment for pedestrians around the transit station.

It appears that the surrounding commercial uses were designed to rely on Hawthorne Avenue for much of its access. This corridor provides a route between NE 3rd Street and NE 4th Street, which connects Franklin Avenue with Greenwood Avenue. With the Bend Towne Center's right-in, right-out only access restrictions at the Franklin Avenue connection it is critical that full turning movements be maintained onto Hawthorne Avenue. The presence of the transit center and its spillover impacts onto the public street limit the ability for the retail uses to access this corridor. The head-in parking next to the vape shop and former Hutch's annex becomes very difficult to use, as motorists are required to almost fully enter the street before they are able to see around the parked buses. The Bend Towne Center traffic has similar issues looking west toward NE 3rd Street with the bus staging that was observed west of the access, and when there are inbound or outbound buses any use of the access is very difficult, as shown in Figure 16.

Figure 16. Existing Congestion on Hawthorne Avenue facing east (Bend Towne Center Access is east of the parked bus).

The design of the station itself is reliant on the public street system for its normal operations, and this design conflicts with the City's on-street parking standards. The parking being monopolized is not adjacent to the facility, the parking area is not located in a pull-out on a Collector roadway (the road is narrowed where the loading areas are designated), and the road does not contain the required bicycle lanes or complete sidewalks. Most importantly, the design creates conflicts between roadway users, pedestrians, and buses, and conflicts with the use of the street by the neighboring properties.

As transit service needs increase throughout the region the problems at Hawthorne Station are likely to grow, further elevating safety concerns, limiting growth of transit operations and impacting nearby residents and business owners. While our team recognizes that the use is a critical service to the City of Bend (and regionally), the site was not designed to accommodate the layout as it currently exists and it appears these impacts were not evaluated through a design process or the required transportation impact analysis at the time of the siting of this regional transit station.

FINDINGS AND RECOMMENDATIONS

Based on this review of the existing system operations and safety, the following is recommended as immediate area improvements while planning and funding can be earmarked to initiate a more involved transit center siting assessment:

- The current Hawthorne Station layout creates conflicts between roadway users and transit center patrons crossing between parked buses and does not provide adequate width to maintain the functionality of the road. In addition, the layout of the site and platform behind parked buses prevents clear sight lines of the entire transit center. This is a dangerous environment in which safety issues are of great concern.
- To reduce the immediate and apparent safety issues at Hawthorne station, the site should be reconfigured with bus staging eliminated on the public streets.
- The taxi parking should be relocated to an area within the COIC staff parking area.
- Sidewalks should be completed along the north side of Hawthorne Avenue to connect the site to the NE 3rd Street corridor and prevent mid-block crossings between parked buses.
- Changes to the Bend Towne Center access onto Franklin Avenue should be reviewed. The current configuration is limited to right-in, right-out movements, allowing left-turns only by traveling east to a secondary access located immediately adjacent to NE 4th Street. Improving the main Franklin Avenue access could help reduce the current layout's reliance on Hawthorne Avenue.
- The transit lobby should remain open during all hours of operation at the station, including times when intermodal carriers such as Greyhound and The Breeze drop patrons at the station.
- Treatments and/or services that improve safety and comfort at the station should be considered. On-site security personnel were noted during various field observations.

This overall review shows that the transit center is located on a small parcel and within an area of the City's transportation system that is already constrained. The transit center is currently reliant on the public street system to meet its daily operational needs and this use is conflicting with the functional role of the street system. This creates an unsafe environment, prevents the growth and expansion of the transit system, and places an undue burden on adjacent residential and commercial neighbors.

While the above immediate changes will improve Hawthorne Station and reduce impacts on other uses to some degree, the site is not properly designed to support the role that is needed; the current operations have outgrown the available space. The current design and operations along Hawthorne Avenue conflict with the roadway's designated function and should not have been approved as it exists, a conclusion that a Transportation Impact Analysis for formal site selection process would have determined if it had been required by the City of Bend through the land-use process at the original siting.

The Bend Transportation System Plan and the current CET 2040 Master Plan have identified a need for a station near the downtown core in a more accessible, transit supportive, and appropriate location. Mobility hubs have also been identified as an important component of an integrated multimodal transportation plan by the City of Bend, but the sites of these facilities have not been determined. These factors point to the need for a substantial effort to review, identify, and relocate the Hawthorne Station to a more suitable location that meets national and State recommendations for a regional transit station. This effort should also determine the ideal location of mobility hubs to ensure the ability of transit to support local and regional growth.

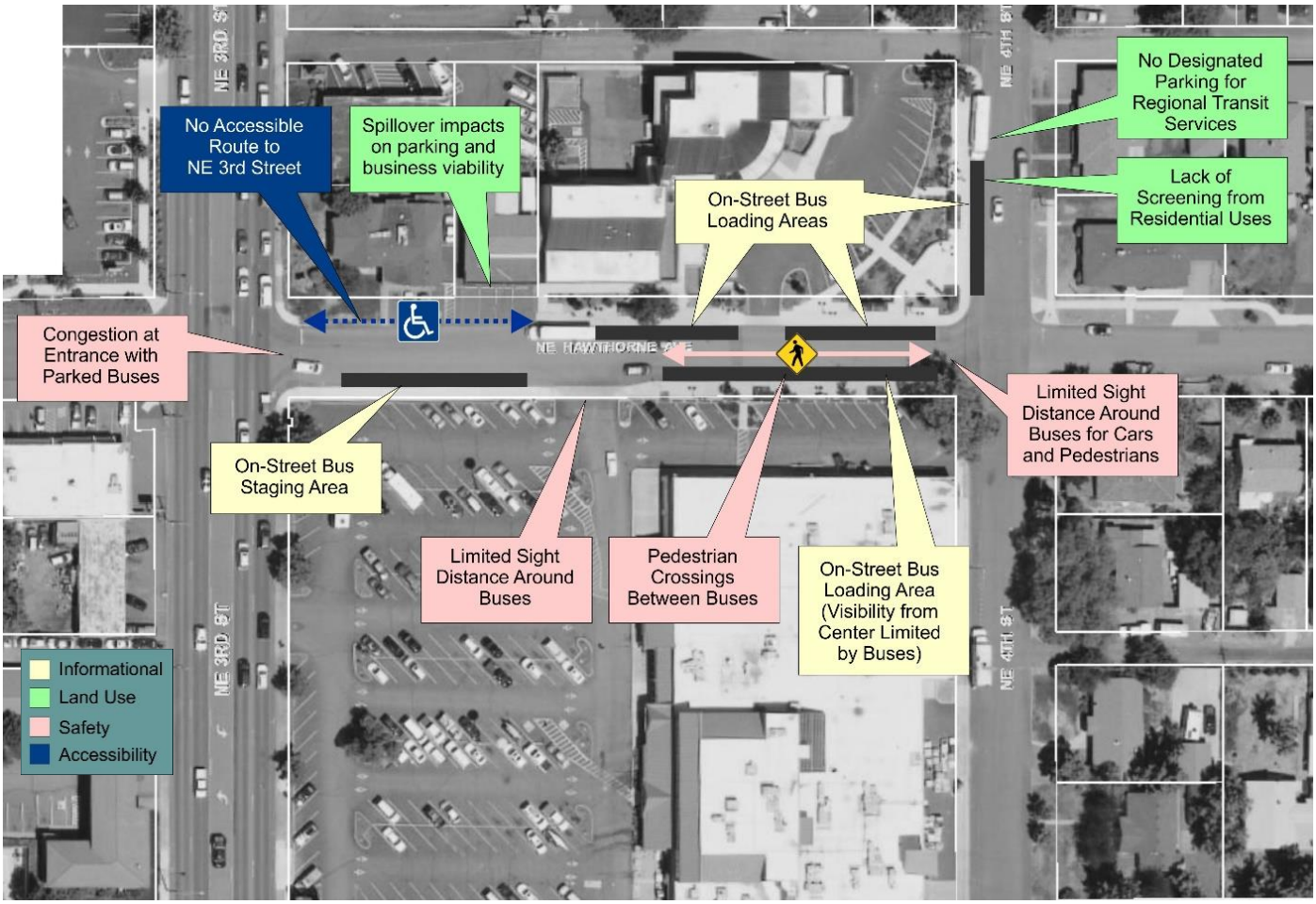


Figure 17. Safety, functionality and conflict-of-use issues at Hawthorne Station

NEXT STEPS

This memorandum identifies current limitations of the existing Hawthorne Transit Center, which serves as the "hub" for the regional transit service throughout Central Oregon. This site was informally established as a transit center in 2006 by City staff and did not include adequate siting studies or analysis prior to its approval. Significant expansion and investment in regional transit has occurred beyond what was initially contemplated within the original application, and the current location is not suitable to support the needed and planned transit service expansion.

The current site does not address the key design elements for a transit center as defined by ODOT, and creates unanticipated and dangerous conflicts between buses, vehicles, and pedestrians along NE Hawthorne Avenue along with sight line issues for surrounding businesses. The facility is reliant on Hawthorne Avenue (classified as a *Major Collector* in the City's Transportation System Plan) and NE 4th Street (a *Minor Arterial*) to support its facility operations, conflicting with the functional roles of these streets and impacting the access and operations of adjacent land uses.

While there are near-term enhancements that should be implemented to improve safety, security, visibility, and accessibility, the site is not adequate to support long-term growth of needed transit services in Bend. Its location is beyond a comfortable walking distance of the downtown core, and as it continues

to grow as a critical transportation service the current issues will become more prevalent. New transit facilities adequate to meet the current and forecast needs must be sited, designed and implemented in the near term.

Please let me know if you have any questions on this initial review at (503) 997-4473 or via email at joe@transightconsulting.com.

References:

1. Transit in Small Cities, ODOT Transportation Growth Management Program, March 2013.
2. 2040 CET Transit Master Plan, September 2013, Central Oregon Intergovernmental Council.