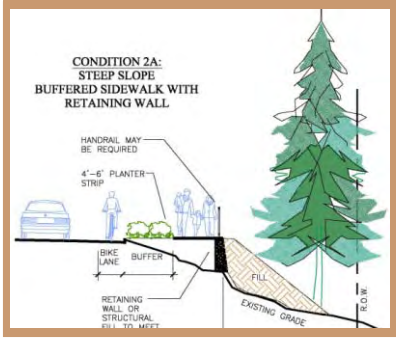
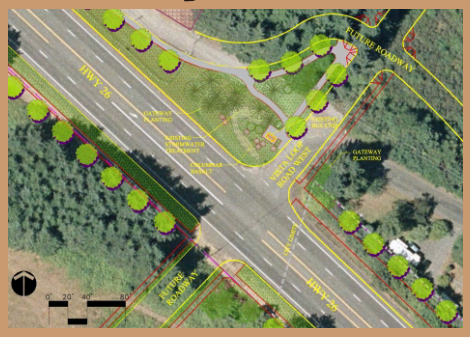
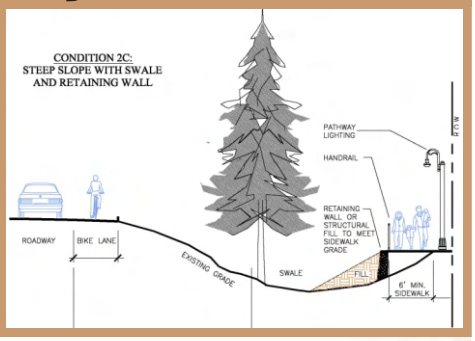
Final Report

US 26 Sandy Gateway Plan







Prepared for

City of Sandy

Prepared by

DKS Associates
TRANSPORTATION SOLUTIONS

In cooperation with

otak

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Jeanne Lawson Associates, Inc.
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The contents of this document do not necessarily reflect views or policies of the State of Oregon.

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1. Introduction

Project Purpose and Background

The city of Sandy is located in Clackamas County along US 26 between Gresham to the west and Mt Hood to the east. US 26 serves a number of roles: providing access to local Sandy businesses and homes along the corridor, serving as a major east/west transportation route between the Portland Metro Area and Mt. Hood to Central Oregon, and is the City's "main street" through the downtown area (Pioneer and Proctor Boulevards).

The highway corridor through the fully developed downtown area along Pioneer and Proctor Boulevards has been designated as a Special Transportation Area (STA). The STA designation assigns management objectives for US 26 that better accommodate high levels of pedestrian and bicycle activity, resulting in a streetscape that encourages low-speed travel and improved driver awareness. Redevelopment of the STA, including streetscape improvements and under-grounding of overhead wires is in process and planned over the next several years to revitalize the City's central business district (CBD).

In contrast, land uses at the outer ends of the City are mostly rural, transitioning to suburban and urban land uses near the downtown STA. US 26 through these areas is typically characterized as having high-speed travel on wide expanses of pavement, with gradual reductions in speed as the downtown is approached. While many lands closer to the STA are fully developed, development patterns are inconsistent closer to the edges of the urban growth boundary (UGB). Because the City is surrounded by rural lands on all sides, with high travel speeds on US 26 to the west and east, motorists are often slow to realize that they have entered an urbanized area. As development continues along US 26 outside of the STA, consistent improvements to the US 26 cross-section are needed to improve motorist awareness, enhance safety and multi-modal access, and provide aesthetic design treatments that are coordinated with the character of the STA.

The US 26 Sandy Gateway Plan will identify needed improvements to enhance highway safety and efficiency along US 26 within the City of Sandy's UGB on the west and east corridors outside of the STA (Pioneer and Proctor Boulevards). As part of this project, the highway cross-section will be refined to provide a transition from the surrounding rural lands to the downtown area, including the design of gateways to communicate to motorists that they are entering an urbanized area. When completed, this plan will serve as a guide for future development and improvement projects along the US 26 corridor.

The following section of this chapter describes the process followed for the development of the US 26 Sandy Gateway Plan, as well as the program implemented to involve the general public and key agencies. Following chapters will outline the vision and guiding principles

used to guide decision making, present the findings of the needs analysis, describe the development of the recommended design features for the US 26 corridors, and discuss procedures for plan implementation.

Planning Process/ Public and Agency Involvement

The US 26 Sandy Gateway Plan process included the following steps:

- Establish policy and regulatory framework;
- Form public and agency involvement plan;
- Inventory/data collection for a year 2007 baseline;
- Evaluate existing (2007) and future (2027) conditions and needs;
- Establish a project vision and supporting guiding principles;
- Consideration of potential design features;
- Refinement of streetscape design features and transportation improvements;
- Provision of planning-level cost estimates of improvements;
- Recommend strategies for plan implementation; and
- Presentation of Recommended Plan to Sandy Planning Commission and City Council at a joint workshop (adoption to occur later through a separate effort).

A Project Management Team (PMT) was formed as the main working body throughout plan development. The PMT was responsible for the development of the plan and interim materials and to ensure products reflected input received from public and agency stakeholders. Membership included consultant staff and representatives from the City and ODOT.

In addition to frequent coordination with City and ODOT staff, the following two committees were formed to guide the planning process:

- Technical Advisory Committee (TAC) – Representatives from ODOT, Clackamas County, the City of Sandy, the Department of Land Conservation and Development, Sandy Police Department, and the Sandy Fire Department were invited to participate in reviewing the technical methods and findings of the plan. The focus of this group was on consistency with the plans and past decisions in adjoining jurisdictions, and developing consensus on plan recommendations.
- Citizens Advisory Committee (CAC) – The Sandy Citizens Advisory Committee included community members representing a range of interests within the city and was formed to act as an advisory group to the PMT. A series of meetings was held with the CAC to report interim findings, discuss outstanding issues, and to gather input.

The committees met regularly through the plan development process to review interim work products, assist in developing and ranking design options and transportation solutions, and to refine plan elements to ensure consistency with community goals and City and ODOT policies and standards. The TAC met a total of four times throughout the planning process, while the CAC met a total of five times.

Additionally, input from the general public was encouraged throughout the project. Three public meetings were organized and held at key phases of the project to provide opportunities to offer input to the development of the plan vision and guiding principles, comment on potential design options, and to review draft recommendations. Each public meeting was advertised in the Sandy Post and over 100 notification letters were mailed prior to each meeting with mailing information updated each time using the latest business license and assessor's databases.

Further public outreach was conducted by City staff through individual meetings with property owners and tenants along the affected US 26 corridors to discuss the potential impacts of plan recommendations, including potential changes in property access. Initially, meetings were held with 16 different citizens, with additional conversations with many others throughout the project.

Finally, the City consistently maintained up-to-date project information on the City website including upcoming meeting dates and locations, meeting agendas and minutes, and draft and final reports. The website also provided contact information to reach a City representative to offer comments or ask questions at any time throughout the project.

2. Plan Vision and Guiding Principles

Overview

A defined vision and supporting guiding principles for the US 26 Sandy Gateway Plan were established to provide direction for the development of the plan and ensure the final product supports the interests of the City, ODOT, stakeholders and the community at large. The following project Vision and Guiding Principles reflect the goals and objectives from prior planning efforts in Sandy, as well as current state and local policies. As part of the project's public involvement effort, the Vision and Guiding Principles were refined based on input received from the Citizen Advisory Committee and the general public through public meetings. Improvement alternatives and strategies developed through this project were evaluated for conformance with the final Vision and Guiding Principles, as is demonstrated in the following chapters.

US 26 Gateway Plan Vision

The City of Sandy is located north and south of US 26, east of Gresham and west of the Villages of Mt Hood in Clackamas County. US 26 provides access to businesses and homes along the corridor, serving as a major east-west transportation route between the Portland Metro Area, Mt. Hood, and Central Oregon and as the City's "main street" in the downtown/central business district Special Transportation Area (STA). Redevelopment of the STA, including streetscape improvements and under-grounding of overhead wires, is planned over the next several years in order to revitalize the City's central business district.

This study is addressing those sections of US 26 both west and east of the central business district. Land uses at the outer ends of the study area are rural, transitioning to suburban and urban land uses near the downtown. As development continues on US 26 outside of the City's central business district, consistent improvements to US 26 will be needed to improve safety, eliminate conflicts, provide access, and create appropriate street frontage for new development.

The Vision for the US 26 Sandy Gateway Plan is a safe and efficient multi-modal highway with design elements that reflect the unique scenic value and historic character of the City of Sandy. Highway design elements enhance motorist awareness as they transition from rural to suburban to urban settings, support community livability as well as provide for statewide travel and freight movement.

Guiding Principles

When highway design is integrated with community planning, a kind of architecture often develops. This "roadway architecture" is bound by technical, functional, and economic considerations along with a "sense of place" for the community. The place of the community is defined by what physically surrounds the roadway. The highway becomes an approach road for the community, creating both a first and last impression for visitors. To ensure this planning effort achieves its vision, the following guiding principles were developed to act as evaluation criteria for proposed elements of the plan. The principles can continue to guide as future implementation occurs.

Highway Mobility

- US 26 must provide for safe and efficient high-speed, continuous operation, ensuring timely movement of freight.
- Unless safety or access considerations are required, the vehicle-carrying capacity of US 26 may not permanently be reduced.
- Sufficient capacity on US 26 must be provided to allow for ODOT mobility standards to be met under future traffic demands.
- Proposed improvements should address local, as well as regional and statewide transportation needs.
- Options for improving local circulation should be explored, particularly to reduce local trip demand on US 26.
- A pattern of connected local streets, and continuous sidewalks and bicycle routes should be provided.
- Traffic signals on US 26 should be located where they will provide the highest benefit for mobility/traffic operations, and improve safety and convenience for pedestrians, bicyclists, and transit riders. The location of traffic signals should be consistent with the street network in the City of Sandy Comprehensive Plan Map and Transportation System Plan and must have the approval of ODOT.

Highway Safety and Access

- The plan should reduce conflicts in the center turn lane on US 26.
- Non-traversable medians should be installed in the center turn lane on US 26, with full and directional openings at locations that meet access spacing standards.
- Property access for parcels on US 26 should be focused on local streets where available, and direct highway access limited.

- ODOT should purchase access rights to US 26 as opportunities arise.
- Shared driveways and inter-parcel circulation for adjoining parcels with compatible land uses should be facilitated.

Pedestrians, Bicycles, and Transit

- Create pedestrian and bicycle-friendly streetscapes that reflect the transition from rural to urban conditions.
- Provide for safe and comfortable transit access along the US 26 corridor.
- Provide bikeway and walkway systems that recognize their users as "design vehicles" of the transportation system.
- Reduce the barrier effect of US 26 by facilitating bicycle and pedestrian crossing.

Highway Design and Character

- Highway design should reflect adjacent land uses with transitions from rural to highway commercial to downtown commercial settings.
- As the highway nears the community it should become an approach road, transporting motorist into the city center and simultaneously providing access to connecting streets.
- Gateways should be designed to identify the entry from rural to suburban and from urban to central business district areas.
- Gateway and streetscape elements should preserve the historic character of "Old Sandy" and emphasize unique scenic resources.
- Streetscape treatments should be coordinated with those proposed in the Sandy Downtown Plan.
- The plan should reflect coordinated efforts between Sandy, Clackamas County, and ODOT and provide a unified "roadway architecture" concept for the City of Sandy.

Plan Implementation

- Provide tools to implement the highway design features and access management vision as properties develop and/or roadway projects are designed.
- Ensure that implementation is consistent with applicable adopted policies and regulations of the City of Sandy and ODOT.

3. Existing and Planned Conditions

Overview

To provide a baseline for the needs assessment, the presence and condition of existing (2007) and planned (2027) transportation facilities within the west and east US 26 study corridors must first be understood. The following sections provide detailed descriptions of facilities available for motor vehicle, pedestrian, bicycle, and transit modes of travel, in addition to presenting data collected in the field to identify travel patterns and engineering analysis to evaluate operational adequacy. A complete inventory of access points onto US 26 from abutting properties and public streets has also been provided to facilitate future planning of access and corridor management.

Study Area

Streetscape Plan Boundaries

The study area for the US 26 Sandy Gateway Plan consists of separate west and east corridors bracketing the downtown US 26 one-way couplet, which is a designated Special Transportation Area (STA). The west corridor starts at the western Sandy UGB (Orient Drive/Jarl Road) and continues to the western interface with the downtown US 26 couplet. The east corridor starts at the eastern end of the downtown US 26 couplet and continues to the eastern UGB (Luzon Lane). Figures 3.1 West and East show the city of Sandy and identify the US 26 west and east study corridors of US 26.

Surrounding Land Uses

Within the west corridor, agricultural and light industrial land uses are concentrated at the western end. Near Orient Drive and 362nd Drive, the corridor transitions to commercial uses. At University Avenue, adjacent land uses are a combination of commercial and residential, with most developments on relatively small lots.

Development density in the east corridor is generally lower, with a small amount of commercial development adjacent to US 26 east of Ten Eyck Road that transitions to residential development near Langensand Road. From Vista Loop Drive West, area development is generally agricultural and light industrial uses.

These existing land uses are generally consistent with comprehensive plan zoning, with the exception of the westernmost and easternmost areas where agricultural and light industrial uses are planned to eventually be replaced by commercial and industrial between Orient Drive and 362nd Drive and village (mixed residential and commercial), residential, commercial, and light industrial from Langensand Road to Luzon Lane. Existing zoning is displayed in Figure 3.2, with comprehensive plan zoning provided in Figure 3.3.

Transportation System Inventory

The following sections describe the presence and condition of existing and planned transportation facilities within the US 26 west and east study corridors for motor vehicle, pedestrian, bicycle, and transit modes of travel.

Motor Vehicle Facilities

Existing Roads

For the purposes of the US 26 Sandy Gateway Plan, the primary focus will be on US 26 and its intersections with major City and County streets. Characteristics describing the existing condition and intended function of the study area roadways of interest were documented through review of the City and County transportation system plans and field reconnaissance. Table 3.1 identifies the authorities for existing roadways, functional classifications, and typical roadway widths of study area roadways. Lane widths along US 26 through the study corridors are shown in Table 3.2. It should be recognized that median and shoulder widths vary in each section of highway and that the widths provided in Table 3.2 are averaged. Figures 3.4 and 3.5 (West and East) illustrate the transportation system inventory for motorized and non-motorized modes, respectively.

Within both study corridors, US 26 is classified as a Statewide Highway on the National Highway System with additional designations as a State Freight Route and Federal Truck Route along its entire length. The ODOT Motor Carrier Transportation Division has designated US 26 through the study area has a route that allows over-dimension loads, including those of widths up to 14 feet.

The west corridor is further classified as an Expressway from 362nd Drive to the west. The east corridor is classified by ODOT in the *Oregon Highway Plan*[1] (OHP) as a Clackamas County, Oregon and National Scenic Byway and is part of a designated Safety Corridor east of the east Sandy City Limits.

[1] 1999 Oregon Highway Plan, Oregon Department of Transportation. Appendix D, p. 228

Table 3.1: Existing Roadway Characteristics

Street Name	Jurisdiction	ODOT Classification	Sandy Classification[2]	Right of Way Width	Travel Lanes
US 26	State	Statewide Highway	Major Arterial	108-180 ft	4/5
SE Orient Dr.	County	-	Minor Arterial	60 ft	2
SE 362 Ave.	City	-	Minor Arterial	60 ft	2
Industrial Way	City	-	Collector	60 ft	2
Ruben Ln.	City	-	Local Street	60 ft	2
SE Bluff Rd.	City	-	Minor Arterial	60 ft	2
SE Ten Eyck Rd.	County	-	Major Arterial	50-60 ft	2
SE Langensand Rd.	City	-	Minor Arterial	60 ft	2
SE Vista Loop Dr. West	City	-	Local Street	60 ft	2
SE Vista Loop Dr. East	City	-	Local Street	60 ft	2

Table 3.2: Existing US 26 Lane Widths

Highway Section	Number of Travel Lanes	Lane Widths	Median Width	Shoulder Widths (LT / RT)
Orient Dr. to 362nd Dr.	4	12'	16'	10' / 16'
362nd Dr. to Industrial Way	4	12'	12'	10' / 10'
Industrial Way to Ruben Ln.	4	12'	16'	16' / 10'
Ruben Ln. to Bluff Rd.	4	12'	12'	10' / 10'
Ten Eyck Rd. to Langensand Rd.	4	12'	4'	8' / 8'
Langensand Rd. to Vista Loop Dr. West	4	12'	12'	4' / 4'
Vista Loop Dr. West to Vista Loop Dr. East	4	12'	4'	4' / 4'
Vista Loop Dr. East to Luzon Ln.	4	12'	12'	4' / 4'

[2] Sandy Transportation System Plan, December 1995

Nine intersections along the highway were selected for analysis of existing operating conditions:

- US 26 at SE Orient Drive,
- US 26 at SE 362nd Drive,
- US 26 at SE Industrial Way,
- US 26 at SE Ruben Lane,
- US 26 at SE Bluff Road,
- US 26 at SE Ten Eyck Road,
- US 26 at SE Langensand Road,
- US 26 at SE Vista Loop Drive West, and
- US 26 at SE Vista Loop Drive East.

The existing lane geometry and traffic controls present at each intersection, as well as the changes in highway cross-section through the corridor, are displayed in Figures 3.6 West and East.

Proposed Roads

The City of Sandy Transportation System Plan (TSP) identifies a number of street extensions that would influence the traffic loading along US 26, including some that would create parallel routes to the highway to improve local connectivity. When completed, a continuous route from Orient Drive to Vista Loop Drive West will be available through extensions of Dubarko Road, Champion Way, and Industrial Way. Segments yet to be constructed include Dubarko Road from Langensand Road to Vista Loop Drive West and from 362nd Drive to Champion Way, as well as an extension of Industrial Way to Orient Drive. A second planned parallel route on the south side of US 26 would be the extension of Industrial Way east to Ruben Lane, which has recently been extended to connect to Dubarko Road to the south.

A parallel route to the north of US 26 includes an extension of Bell Street between Bluff Road and 362nd Drive. 362nd Drive would also be extended from US 26 to Kelso Road. In addition, Ruben Lane and University Avenue would be extended to create a connection to the new extension of Bell Street. Figures 3.4 West and East illustrate approximate alignments for these planned streets as depicted in the TSP.

In addition to these roadway extensions, the TSP also proposes a feasibility analysis for the construction of a US 26 bypass to the south of Sandy outside of its Urban Growth Boundary (UGB).

To supplement these roads, the City of Sandy Development Code (17.84.50 B1) states that arterials should be spaced in one-mile intervals and that local streets shall maintain a minimum of 150 feet between the nearest edges of the two right-of-ways. Block lengths are limited to 400 feet without a variance, thus limiting local street spacing to a maximum of 400 feet.

Pavement Conditions

The City of Sandy maintains records of the pavement condition on all roads under their jurisdiction as part of their ongoing Pavement Management System (PMS). Pavement conditions are rated in a Pavement Condition Index (PCI), where ratings of 0 to 24 are considered "Poor", 25 to 49 are considered "Fair", 50 to 69 are considered "Satisfactory", and 70 to 100 are considered "Good". While most data on pavement conditions is collected by the City, data pertaining to US 26 is provided by ODOT. Figures 3.7 West and East show the PCI ratings for the various streets along the study corridor, along with locations of known utilities. In general, most of the City streets are in "Good" condition, with pavement on US 26 rated as "Satisfactory".

Parking

On-street parking is allowed along US 26 through most of the study corridors. In general, parking is allowed unless specifically prohibited through signing or painted on the curb, which is commonly done on a case-by-case basis where parking activity has been determined to be undesirable for safety or operational reasons. The frequency of on-street parking is often determined by the presence of nearby attractions and availability of adequate shoulder width. On-street parallel parking commonly occurs on the south side of US 26 between approximately milepoint 23.12 (nearly 210 feet east of Industrial Avenue) and milepoint 23.32 (Kate Schmitz Avenue), as well as between milepoint 23.68 (University Avenue) and milepoint 23.85 (approximately 100 feet west of Bluff Road). Areas where on-street parking is frequently observed are shown in Figure 3.4 West (none known in the east corridor).

Pedestrian & Bicycle Facilities

The locations of sidewalks and bike lanes along US 26 were inventoried and have been mapped in Figures 3.5 West and East. Along the west corridor, sidewalks are available on the south side of the highway starting approximately 900 feet west of Champion Way and running all of the way to Bluff Road, with a gap between Ruben Lane and University Avenue. On the north side of the west corridor, sidewalks begin about 400 feet west of Industrial Way and continue to Bluff Road. The majority of the sidewalks on both sides of the highway are adjacent to the curb.

In the east corridor, there are only two short segments of sidewalk. One segment on the south side of US 26 just west of Langensand Road in front of a residential development is less than 300 feet long. The other segment, on the north side of US 26 between Vista Loop East and Luzon Lane along the frontage of Fred's RV World is approximately 600 feet long.

Marked crosswalks on US 26 are present at all signalized study intersections in the west corridor, including the intersections at Orient Drive, 362nd Drive, Industrial Way, Ruben Lane, and Bluff Road. However, only the intersection at Ruben Lane has crosswalks provided on all approaches, with other intersections having only one marked crosswalk on US 26. In the east corridor, crosswalks are present on the approaches across Ten Eyck Road and Wolf Drive, with a two-stage marked crossing at the west approach of US 26. There are no other marked crosswalks at any of the other study intersections in the east corridor.

The shoulders along US 26 vary between four and twelve feet in width and have discontinuous, marked bike lanes or bike shoulders along portions of the corridor. Bike lanes are defined as lanes that have been marked on the road for exclusive bicycle use (bicycle rider decal on pavement), while bike shoulders include shoulders not marked for exclusive bicycle use, but of suitable width for bicycle use. Bike lanes should be five to six feet in width, while the recommended width of bike shoulders is six feet, with a minimum of four feet allowed where physical limitations are present. However, when adjacent to a curb, guardrail, or other roadside barrier, a minimum width of five feet must be used.[3]

Between Orient Drive (milepost 22.15) and milepost 22.20, the shoulder width on both sides of the highway is 10 feet, which is sufficient for a bike shoulder. At milepost 22.20, a bike lane heads east to just past Bluff Road. Portions of this section also have on-street parking with 16-foot shoulders (10 feet of parking adjacent to the curb, with a six-foot bike lane between the parking and travel lane). Heading westbound from Bluff Road, a marked bike lane is present until approximately 300 feet west of Industrial Way, after which the shoulder is no longer marked as a bike lane but has sufficient width for a bike shoulder.

There are no marked bike lanes along the east corridor and the shoulder width varies between four and 12 feet. Starting at Ten Eyck Road (milepost 24.61) east to milepost 25.07 (approximately ½ mile), the shoulder width on both sides of the highway is wide enough for bike lanes, but narrows to four feet between Langensand Road and Vista Loop Drive West (mileposts 25.12 and 25.65, respectively). At Vista Loop Drive West heading east, the shoulders are wide enough for bicycle travel until milepost 25.89 (approximately 1,700 feet east of Vista Loop Drive West) where they narrow back down to four feet through the rest of the study corridor.

Transit

The City of Sandy has both fixed route and demand responsive transportation options. The fixed route offers service provided by Sandy Area Metro (SAM) along US 26 between Gresham and downtown Sandy and between Estacada and downtown Sandy. SAM runs on ½-hour headways between the hours of 5:30 a.m. and 9:00 p.m. weekdays, every hour between 10:30 a.m. and 11:30 p.m. on Saturday, and has no service on Sunday. The Mountain Express, operated by Wheels Community Transportation, is a fixed route service

[3] *2003 Highway Design Manual*, Oregon Dept. of Transportation, p. 11-2.

between Sandy and Rhododendron running every two hours between 6:20 a.m. and 7:00 pm Monday through Friday.

The SAM service is supported with STAR, a demand-response service, operated by Wheels Community Transportation, for door-to-door trips (at cost of $0.50 per trip with 24-hour notice) to access local services and provides a feeder service to the fixed route. The STAR service also runs on a fixed route within Sandy city limits during commuter hours (5:30 a.m. to 7:30 a.m. and 6:30 p.m. to 8:30 p.m.) on weekdays. STAR provides demand-response service during off-peak hours (7:30 a.m. to 6:30 p.m. and 8:30 p.m. to 9:00 p.m.) on weekdays and between 10:30 a.m. to 4:30 p.m. on Saturdays, with no service on Sunday. The above mentioned transit routes and stops are depicted in Figures 3.5 West and East.

Traffic Volume Data

To further support the needs assessment, traffic volume data under existing conditions was collected in the field at key locations to be used in combination with the facilities inventory to identify opportunities and constraints within the US 26 corridors. This effort also included the preparation of forecasted traffic volumes for the planning year of 2027.

Existing Traffic Volumes

Count Data

Manual turn movement counts were collected for all of the study area intersections during the first week of January on a Friday afternoon between 3:00 and 6:00 p.m., which is reported to be the typical peak period of traffic through the City. Due to the nature of the travel through the City of Sandy and the surrounding area, two different traffic patterns emerge that are associated with commuter-based trips and recreation-based trips. In the west study corridor, commuter-based trips to and from the Metro area predominate. The east study corridor is more heavily influenced by recreation-based trips.

In addition to the manual turn movement counts, a 24-hour tube count was collected to record bi-directional traffic volumes along Langensand Road south of US 26 for the analysis of traffic signal warrants.

30th Highest Hourly Volume

Because transportation improvements are typically designed for the 30th highest annual hour of traffic volumes (30 HV) experienced within the year, a seasonal factor was applied to the January counts obtained to better represent volumes seen during that time. To determine when the 30th highest annual hour occurs, data was examined from two Automatic Traffic Recorder (ATR) stations on US 26 that record highway traffic volumes year-round.

The first ATR is located in Gresham (ATR 26-003) approximately eight miles west of Sandy.

The second ATR is located in Rhododendron (03-006) approximately 18 miles east of Sandy. The Gresham ATR showed peak travel occurring in the months of July and August, with seasonal variations no greater than 13% during any month of the year, which is typical of commuter-based travel. However, while the Rhododendron ATR also showed peak travel occurring in July, seasonal variations throughout the year reached nearly 80% during some months, which is common in corridors characterized by recreation-based travel.

While both commuter-based and recreation-based trips are common in each of the study corridors, each corridor's proximity to the Metro area, developed land within Sandy, and major area roadways (e.g., OR 212, OR 211, Bluff Road, Orient Drive, and Ten Eyck Road), affects the influence of different trip types on travel characteristics. As previously noted, the west study corridor is strongly influenced by commuter-based trips. Therefore, a seasonal factor of 1.13, derived from the Gresham ATR, was applied to the January counts to replicate 30th highest hour volumes that occur in July and August.

Because the east study corridor is more heavily influenced by recreation-based trips than travel occurring at the Gresham ATR, but still more heavily influenced by commuter-based trips than travel occurring at the Rhododendron ATR, the seasonal factor of 1.23 for this area was derived by averaging the data from both ATRs.

The final 30 HV traffic volumes developed for the study intersections are displayed in Figures 3.8 West and East.

Future Traffic Volumes

Future year traffic volumes were forecast through the study area intersections to represent conditions expected during the 30th highest annual hour in the year 2027. For future years of analysis, the 30th highest annual hour volumes are often referred to as "design hour volumes", or DHV.

The 2027 DHV for study intersections were forecast by applying an annual growth rate over twenty years to the 2007 30 HV previously developed and applying additional growth expected from approved developments that are not yet occupied. The growth rate was calculated using ODOT's 2025 Highway Future Volume Tables, which use historical rates of growth to project traffic volumes in the future. Using these tables, an annual growth rate of 2.2% per year was calculated. However, to be consistent with other recent traffic studies completed in the Sandy area, a slightly higher growth rate of 2.5% was used.

The forecasted traffic volumes for 2027 were further refined by making adjustments to account for the impact of the planned Dubarko Road extension from Langensand Road to US 26, opposite Vista Loop Drive West. These adjustments were made by following the methodology employed as part of a Traffic Impact Study[4] related with the annexation and

[4] *Trip Generation Comparison Letter for the proposed Vista Loop Properties Annexation and Development – Sandy, Oregon*, Kittelson & Associates, Inc., August 3, 2005.

development of the Vista Loop properties surrounding the future US 26/ Dubarko Road intersection, which used output from the EMME/2 model prepared for the City of Sandy TSP (1995) to measure traffic diversion caused by the Dubarko extension. The finding of this study was that 75% of traffic (local and regional) traveling between US 26 to the east and OR 211 to the south would divert to Dubarko Road, rather than pass through the US 26/ OR 2ll intersection. Therefore, appropriate adjustments were made to the study intersections on US 26 at Ten Eyck Road, Langensand Road, and Vista Loop Drive West to model this effect.

The final 2027 DHV at study intersections are displayed in Figures 3.8 West and East.

Operational and Safety Analysis

In the following sections, the physical inventory describing transportation facilities is analyzed in combination with the data collected in the field to assess operational and safety conditions and compare them to adopted and accepted standards.

Crash Analysis

The most recent five years (2001 – 2005) of available crash data for the US 26 study corridors was obtained from ODOT and used to assess the crash history. To identify potential deficiencies, crash rates for sections of US 26 were compared to statewide average crash rates for similar facilities, crash types were analyzed to identify patterns or trends, and ODOT's Safety Priority Index System was reviewed to identify potentially hazardous locations.

Corridor Analysis

Crash rates identifying the number of crashes per million vehicle-miles traveled for specified sections of US 26, as well as statewide average crash rates for various facility types, were obtained from ODOT's *2005 State Highway Crash Rate Tables*[5]. Highway sections analyzed in these tables are categorized by area type (e.g. urban city, suburban, rural) and functional classification to provide a basis for comparison between various facilities.

The reported crash rates through the US 26 corridors are shown in Table 3.3. Note that some sections of US 26 within the study corridors were not included in the predetermined highway sections from the Crash Rate Tables. However, as the remaining sections are less than a mile in length each, a reliable crash rate for each of these areas could not be calculated.

The crash rates experienced on the west corridor are much higher than that of the east corridor, but both corridors are significantly lower than the statewide average for urban non-freeway principal arterials.

[5] *2005 State Highway Crash Rate Tables (August 2006)*. Retrieved December 2006, from Oregon Dept. Transportation Web site: http://www.oregon.gov/ODOT/TD/TDATA/car/CAR_Publications.shtml

Table 3.3: US 26 5-year Crash Rate Comparison for Statewide Urban Cities

Section Limits (Mile points)	Section Description	Crashes per Million Vehicles 2005	2004	2003	2002	2001
	Statewide Average Rate	**2.25**	**2.04**	**3.15**	**2.88**	**3.59**
MP 22.60 - 23.87	US 26: West City Limits – Bluff Rd	1.94	1.59	1.60	1.90	1.54
MP 24.61 - 25.90	US 26: End Couplet to East City Limits	0.20	0.67	0.67	0.65	0.54

Even though the crash rates along both the west and east corridors are lower than the State averages, the individual crashes types were examined for each corridor to see if any patterns would emerge. Figures 3.9A and 3.9B break down the crash types and severities experienced, with percentages of each. In the west corridor, most crashes involved rear-end (51%) or turning (24%) collisions. However, in the east corridor, crashes involving collisions with fixed objects (23%) are significantly more common (only representing 2% of crashes in west corridor) and are second only in frequency to rear-end collisions (34%), with turning collisions (20%) ranking third. In both study corridors, crash severities are typically low, with approximately 80% of all crashes involving only property damage or minor injuries.

There was a single pedestrian-related crash during the five-year time span; a pedestrian was hit while trying to cross US 26 at the intersection of University Avenue. There were four fatalities in five years. The first fatal crash occurred at the Orient Drive intersection, and involved a single vehicle driving off the road and hitting a fixed object. The second fatal crash, occurred just east of Orient Drive, involving four vehicles, with the initial crash caused by someone driving on the wrong side of the road. The third fatal crash occurred at University Avenue, where a speeding vehicle collided head-on with a stopped vehicle in the two-way left turn lane. The fourth fatal crash occurred in the east study corridor just west of Vista Loop Drive West. This crash was the result of one driver not yielding the right of way and turning left from the mainline in front of an oncoming driver, resulting in three fatalities.

Figure 3.9A: Sandy US 26 West Corridor Crashes (2001-2005)

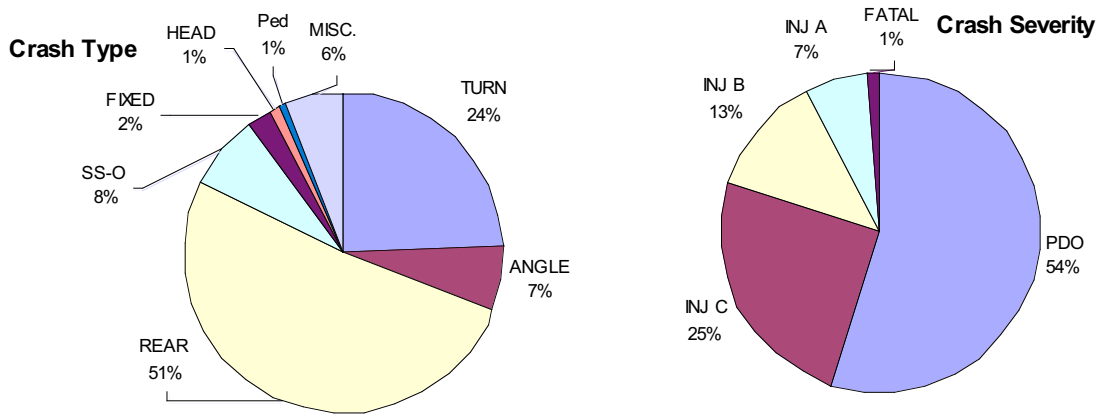
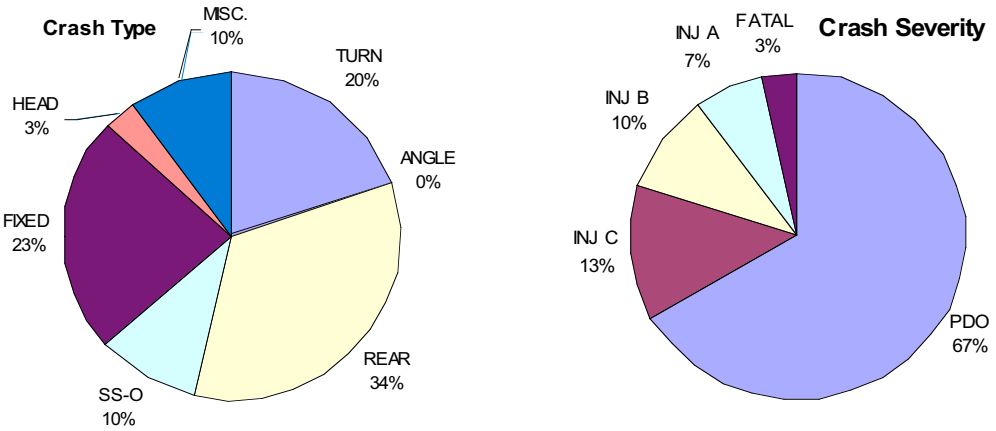


Figure 3.9B: Sandy US 26 East Corridor Crashes (2001-2005)



Key:

PED: Pedestrian
FIXED: Fixed object or other object
REAR: Rear end
ANGLE: Angle
HEAD: Head on
TURN: Turn movement
SS-O: Sideswipe - overtaking
MISC: Miscellaneous
PDO: Property Damage Only
INJA: Incapacitating Injury
INJB: Non-Incapacitating Injury
INJC: Possible Injury
FATAL: Fatal

Intersection Analysis

Crash rates at study intersections were calculated to identify problem areas in need of mitigation. Because the total number of crashes experienced at an intersection is typically proportional to the number of vehicles entering it, a crash rate describing the frequency of crashes per million entering vehicles (MEV) is used to determine if the number of crashes should be considered high. Using this technique, a crash rate of 1.0 MEV or greater is commonly used to identify when further investigation is warranted. As shown in Table 3.4, crash rates calculated at all study intersections are well below this threshold, indicating the frequency of crashes is typical for the volume of traffic served.

Table 3.4: Study Intersection Crash Rates (MEV)

Intersection on US 26	Crash Rate
SE Orient Drive	0.11
SE 362nd Drive	0.28
SE Industrial Way	0.37
SE Ruben Lane	0.34
SE Bluff Road	0.25
SE Ten Eyck Road	0.17
SE Langensand Road	0.11
SE Vista Loop Drive West	0.00
SE Vista Loop Drive East	0.00

SPIS Ratings

This analysis was supplemented by a review of ODOT Safety Priority Index System listings for locations in the study corridors ranked among the state's top 10% of hazardous locations. The Safety Priority Index System (SPIS) is a method developed by ODOT for identifying hazardous locations on state highways, with the score based on three years of crash data as well as crash frequency, rate, and severity. This rating provides a general comparison of the overall safety of the highway based on crash information for all highway segments throughout the state.

According to ODOT's 2006 SPIS ratings, only two intersections - US 26 at 362nd Drive and at University Avenue - within the study area rate within the Top 10% SPIS. In the last five years, a total of 18 crashes occurred at the former intersection and 16 crashes occurred at the latter intersection. At both intersections, the majority of the crashes involved rear-end-type crashes, 61% at the intersection of US 26/362nd Drive and 63% at the intersection of US 26/University Avenue. The circumstances behind these types of crashes are different for each intersection, as one is signalized and the other is not. The rear-end crashes at US 26/362nd Drive are most likely a result of vehicles being rear-ended while slowing down or stopping for the signal, whereas at US 26/University Avenue, the crashes are most likely a result of drivers slowing on US 26 to make a turn or drivers turning onto US 26 from University Avenue when there were insufficient gaps in traffic.

At the intersection of US 26/University Avenue, seven of the 16 crashes occurred in 2005,

with less than three per year occurring during the other years. Ten of the 16 or nearly 63% of the crashes involved an injury, including one fatality and one pedestrian injury at this intersection. The fatal crash involved a head-on collision with multiple vehicles in the center turn lane. The severity of crashes experienced and increased frequency in 2005 are the most likely result for this intersection's high SPIS rating.

At the intersection of US 26/362nd Drive, seven of the 18 crashes occurred during 2003, four in 2005, three in 2004, and two each in 2002 and 2001. Of these crashes, over 60% resulted in injury with the remainder being property damage only (PDO) crashes. No pedestrian crashes occurred at this intersection. The high SPIS rating at this intersection may be a result of the number of crashes that occurred in 2003.

The corridor crash data obtained was further broken down to relate crashes to highway access. In the west corridor, it was found that 34% of all crashes occurred at public street intersections and 10% occurred at private driveways. However, in the east corridor, 25% occurred at public street intersections, while 13% occurred at private driveways.

Existing Traffic Operations

Measures of Effectiveness

All study intersections are located along US 26 and, therefore, *1999 Oregon Highway Plan*[6] (OHP) mobility standards apply. ODOT mobility standards are based on volume-to-capacity (v/c) ratios, which are comparisons of the actual volume using the intersection (or a particular movement) to the maximum volume that could be served. A v/c ratio greater than 1.0 indicates there is more demand for the intersection than it can actually serve, which often results in long queues at the approaches. The OHP specifies v/c thresholds for each highway classification, reflecting the management objectives for that type of facility. Through the study area, US 26 is classified a Statewide highway and Freight Route within the Sandy UGB.

Because the intersections with Langensand Road, Vista Loop Drive West, and Vista Loop Drive East are unsignalized, the stop-controlled movements or those that must yield right of way may dictate whether the intersection can operate safely and efficiently. Therefore, according to the OHP, a mobility standard requiring a v/c ratio of 0.85 or lower at Langensand Road and 0.80 or lower at Vista Loop Drive West and East for those movements shall be applied.

Different standards apply at Bluff Road and Ten Eyck Road within the downtown Special Transportation Area (STA), and at Orient Drive and 362nd Drive within the designated expressway. Mobility standards for each intersection are shown in Table 3.5.

Instead of using a v/c ratio to measure the level of mobility at an intersection, the City of Sandy TSP utilizes a Level of Service performance standard. For informational purposes, the

[6] *1999 Oregon Highway Plan* – August 2005 Amendment, Oregon Department of Transportation, 2005.

LOS of each study intersection is also shown in Table 3.5. LOS is similar to a "report card" rating based upon average delay. Level of Service A, B, and C indicate conditions where vehicles can move freely. Level of Service D and E are progressively worse. Level of Service F represents conditions where drivers experience very long delays, often resulting in long queues at intersection approaches. The City of Sandy TSP sets a mobility standard of LOS D for signalized, as well as unsignalized intersections.

Capacity Analysis

Capacity analysis of the study intersections was conducted using the 2007 30HV volumes and Synchro[7] software to determine existing operating conditions based on the *Highway Capacity Manual 2000*[8] methodology. This analysis was then compared to adopted performance standards to identify system deficiencies. The results are displayed below in Table 3.5.

Table 3.5: Existing Operating Conditions (2007 30 HV)

Intersection	Delay (seconds)	LOS	v/c	ODOT Standard (v/c)
Signalized				
US 26 at SE Orient Drive	19.3	C	**0.75**	0.70
US 26 at SE 362nd Avenue	34.4	C	**0.90**	0.70
US 26 at Industrial Way	19.8	B	**0.85**	0.70
US 26 at Ruben Lane	29.7	C	**0.91**	0.75
US 26 at SE Bluff Road	38.8	D	**>1.0**	0.85
US 26 at SE Ten Eyck Road	39.1	D	**0.91**	0.85
Unsignalized				
US 26 at SE Langensand Road	>50	A/F	**>1.0**	0.85
US 26 at SE Vista Loop Drive West	14.3	A/B	0.08	0.80
US 26 at SE Vista Loop Drive East	18.2	A/C	0.01	0.80

Notes: Highlighting indicates performance standards are not met.
A/A=US 26 (Major Street) LOS/city street (minor street) LOS
Signalized and all-way stop delay = average vehicle delay in seconds for entire intersection
Unsignalized two-way stop delay = highest minor street approach delay

[7] *Synchro, Version 6*. Trafficware Ltd, 2005.

[8] *Highway Capacity Manual 2000*. Transportation Research Board, 2000.

As shown, nearly all study intersections are currently failing to meet ODOT's mobility standards, with only the intersections on US 26 at Vista Loop Drive West and Vista Loop Drive East operating acceptably. However, only the intersection at Langensand Road fails to meet City mobility standards.

Signal Warrant Analysis

A signal warrant analysis was performed for the unsignalized intersection of US 26 at Langensand Road to determine if side-street volumes are high enough to justify (i.e., warrant) the added delays that would be imposed on mainline traffic by construction of a signal. For this analysis, the *Manual on Uniform Traffic Control Devices* (MUTCD) signal Warrant #1 (8-hour warrant) was assessed using the 24-hour tube count data[9] collected on Langensand Road south of its intersection with US 26. The result of the analysis revealed that the signal is not warranted at the 100% or the 70% warrant level.

Signal warrants were not evaluated for the unsignalized intersections on US 26 at Vista Loop Drive West and Vista Loop Drive East, as peak hour traffic volumes on these stop-controlled approaches were determined by inspection to be too low to meet warrants.

95th Percentile Queues

An estimate of the 95th percentile vehicle queue for each of the signalized intersection approach movements was made using SimTraffic modeling software. This value estimates the queue length that would have only a five percent chance of being exceeded during the peak hour and is commonly used for design purposes. Queuing results are summarized in Table 3.6.

As shown below, there are several intersection movements throughout the study area that experience vehicle queues longer than can be accommodated given existing storage lengths, which should be expected given some of the high v/c ratios reflected in Table 3.5. When vehicle queues extend past available storage bays, turning queues can block through movements and through movements can block upstream intersections. The result is an increased potential for rear-end collisions and a significant loss in system capacity.

[9] 24-Hour tube count data was collected by All Traffic Data on January 5, 2007.

Table 3.6: 95th Percentile Vehicle Queue Lengths (2007 30 HV)

Intersection on US 26	Movement (US 26 EB/WE)	Available Storage (ft.)	95th % Queue (ft.)	Exceeds Storage?
SE Orient Dr.	EB Left	460	50	No
	EB Through	>1,000	375	No
	EB Right	150	50	No
	WB Left	460	25	No
	WB Through	3,100	225	No
	WB Right	150	75	No
	NB Shared	>500	50	No
	SB Shared	>500	175	No**
SE 362 Dr.	EB Right	225	375	**Yes**
	EB Through	3,100	275	No
	WB Left	430	550	**Yes**
	WB Through	1,625	2,100	**Yes**
	NB Left	100	925	**Yes**
	NB Right	100	175	**Yes**
Industrial Way	EB Left	85*	100	No
	EB Through	1,500	475	No
	WB Left	85*	125	No
	WB Through	1,500	2,475	**Yes**
	WB Right	80	225	**Yes**
	NB Shared	>500	425	No
	SB Left	200	175	No
	SB Through/Left	200	400	**Yes**
	SB Right	200	200	No
Ruben Ln.	EB Left	100	175	**Yes**
	EB Through	75*	400	No
	EB Right	225	75	No
	WB Left	100*	150	No
	WB Through	2,164	2,900	**Yes**
	WB Right	100	125	**Yes**
	NB Shared	200	875	**Yes**
	NB Left	85	75	No
	SB Left	75	150	**Yes**
	SB Through/Left	100	850	**Yes**
	SB Right	85	200	**Yes**

*Note: Does not include available storage from the center two way left turn-lane.
**Note: Queue blocks upstream intersection.

Table 3.6 (continued): 95th Percentile Vehicle Queue Lengths (2007 30 HV)

Intersection on US 26	Movement (US 26 EB/WE)	Available Storage (ft.)	95th % Queue (ft.)	Exceeds Storage?
SE Bluff Rd	EB Left	80*	200	**Yes**
	EB Through	>1,000	950	No
	EB Right	50	175	**Yes**
	WB Left	170	200	**Yes**
	WB Through	>1,000	850	No**
	WB Right	175	175	No
	NB Shared	>500	600	No**
	SB Shared	>500	775	No**
SE Ten Eyck Rd	EB Left	200	200	No
	EB Through	1,000	800	No
	EB Right	120	800	**Yes**
	WB Left	115	75	No
	WB Through	>1,000	475	No
	WB Right	75	475	**Yes**
	NB Shared	270	400	**Yes**
	SB Shared	>500	300	No
SE Langensand Rd	EB Left	115	25	No
	WB Left	150	50	No
	NB Left	150	225	**Yes**
	NB Right	150	75	No
SE Vista Loop Drive West	EB Left	150	75	No
	SB Shared	>500	75	No
SE Vista Loop Drive East	EB Left	150	20	No
	SB Shared	>500	50	No

*Note: Does not include available storage from the center two way left turn-lane.
**Note: Queue blocks upstream intersection.

Future Traffic Operations

Capacity Analysis

The 2027 DHV turn movement volumes were used to calculate the future traffic operations at the study intersections for the No Build Scenario ("No Build" assumes only planned improvements that are reasonably likely to be funded) using the same methodology as employed for the existing conditions scenario. As no projects are currently planned to modify the study area intersections, other than US 26/ Vista Loop Drive West, this scenario assumes intersection geometries will remain unchanged despite increasing traffic volumes and deteriorating operations. Table 3.7 lists the anticipated delay, LOS, v/c ratio, and applicable ODOT mobility standard for the study intersections. As shown, operating conditions will

deteriorate considerably over the next 20 years, with only the intersection on US 26 at Vista Loop Drive East meeting ODOT mobility standards. All intersections will fail to meet City mobility standards.

Table 3.7: Future No-Build Operating Conditions (2027 DHV)

Intersection	Delay (seconds)	LOS	v/c	ODOT Standard (v/c)
Signalized				
US 26 at SE Orient Drive	>80.0	F	**>1.0**	0.70
US 26 at SE 362nd Drive	>80.0	F	**>1.0**	0.70
US 26 at Industrial Way	>80.0	F	**>1.0**	0.70
US 26 at Ruben Lane	>80.0	F	**>1.0**	0.75
US 26 at SE Bluff Road	>80.0	F	**>1.0**	0.85
US 26 at SE Ten Eyck Road	>80.0	F	**>1.0**	0.85
Unsignalized				
US 26 at SE Langensand Road	>50.0	A/F	**>1.0**	0.85
US 26 at SE Vista Loop Drive West	>50.0	A/F	**>1.0**	0.80
US 26 at SE Vista Loop Drive East	>50.0	A/F	0.52	0.80

Notes: Highlighting indicates performance standards are not met.
A/A=US 26 (Major Street) LOS/city street (minor street)
LOS Signalized and all-way stop delay = average vehicle delay in seconds for entire intersection
Unsignalized two-way stop delay = highest minor street approach delay

Signal Warrant Analysis

Signal warrants were again examined for unsignalized study intersections under 2027 forecast conditions. The intersection of US 26 at Langensand Road was analyzed using the same methodology employed for the existing conditions analysis, with the 2027 traffic volumes influenced by growth and the construction of the Dubarko Road extension. Again, it was found that the minor street traffic from Langensand Road would be too low to meet warrants and that the construction of a traffic signal to serve these trips would not be justified given the delay it would cause to mainline traffic.

With the extension of Dubarko Road to US 26 opposite Vista Loop Drive West, the three-way intersection will be converted into a four-way intersection, introducing additional turning movements that could benefit from signalization. While an initial investigation indicated that traffic volumes on Dubarko Road and Vista Loop Drive West would be slightly too low to

meet warrants for signalization by 2027, other factors were taken into consideration as well. The volume of northbound left turns from Wolf Drive onto US 26 is currently very high, which may be the result of the limited availability of protected left turn movements for the residential neighborhoods south of US 26. This was confirmed by one area resident that stated that the signal at Wolf Drive was the safest and easiest way out of the neighborhood to destinations west. If even a small amount of traffic were to divert to the Dubarko Road intersection with US 26 to utilize a new traffic signal, the preliminary signal warrants could be met. Signalization of this intersection would also provide a needed pedestrian crossing within the east study corridor. Therefore, for planning purposes, it should be assumed that the intersection of US 26 at Dubarko Road/Vista Loop Drive West will be signalized by 2027.

Signal warrants were not evaluated for the unsignalized intersection on US 26 at Vista Loop Drive East, as peak hour traffic volumes on this stop-controlled approach were determined by inspection to be too low to meet warrants.

95th Percentile Queues

An estimate of the 95th percentile vehicle queue for each of the signalized intersection approach movements under 2027 conditions was made using the same methodology employed for existing conditions. Queuing results are summarized in Table 3.8.

As shown, there are still many intersection movements experiencing queues that exceed existing storage lengths and some very long queues along the mainline of US 26, with some greater than ¼-mile.

Table 3.8: 95th Percentile Vehicle Queue Lengths (2027 DHV)

Intersection on US 26	Movement (US 26 EB/WE)	Available Storage (ft.)	95th % Queue (ft.)	Exceeds Storage?
SE Orient Dr.	EB Left	460	600	**Yes**
	EB Through	>1,000	925	No
	EB Right	150	25	No
	WB Left	460	100	No
	WB Through	3,100	425	No
	WB Right	150	405	**Yes**
	NB Shared	>500	125	No
	SB Shared	>500	325	No
SE 362 Dr.	EB Right	225	775	**Yes**
	EB Through	3,100	325	No
	WB Left	430	650	**Yes**
	WB Through	1,625	1,600	No
	NB Left	100	1,800	**Yes**
	NB Right	100	125	**Yes**
Industrial Way	EB Left	85*	125	No
	EB Through	1,500	950	No
	WB Left	85*	75	No
	WB Through	1,500	400	No
	WB Right	80	50	No
	NB Shared	>500	225	No
	SB Left	200	125	No
	SB Through/Left	200	125	No
	SB Right	200	25	No
Ruben Ln.	EB Left	100	275	**Yes**
	EB Through	75*	650	No
	EB Right	225	250	**Yes**
	WB Left	100*	50	No
	WB Through	2,164	525	No
	WB Right	100	150	**Yes**
	NB Shared	200	775	**Yes**
	NB Left	85	100	No
	SB Left	75	125	**Yes**
	SB Through/Left	100	675	**Yes**
	SB Right	85	300	**Yes**

Table 3.8 (continued): 95th Percentile Vehicle Queue Lengths (2027 DHV)

Intersection on US 26	Movement (US 26 EB/WE)	Available Storage (ft.)	95th % Queue (ft.)	Exceeds Storage?
SE Bluff Rd	EB Left	80*	275	**Yes**
	EB Through	>1,000	1,350	No**
	EB Right	50	150	**Yes**
	WB Left	170	100	No
	WB Through	>1,000	1,825	No**
	WB Right	175	250	**Yes**
	NB Shared	>500	875	No**
	NB Shared	>500	1,750	No**
SE Ten Eyck Rd	EB Left	200	175	No
	EB Through	1,000	1,050	**Yes**
	EB Right	120	1,075	**Yes**
	WB Left	115	100	No
	WB Through	>1,000	850	No
	WB Right	75	850	**Yes**
	NB Shared	270	700	**Yes**
	SB Shared	>500	750	No**
SE Langensand Rd	EB Let	115	50	No
	WB Left	150	50	No
	NB Left	150	1,000	**Yes**
	NB Right	150	1,025	**Yes**
SE Vista Loop Drive West	EB Left	150	75	No
	EB Through	>1,000	25	No
	WB Through	>1,000	400	No
	WB Right	200	375	**Yes**
	NB Shared	500	1,750	**Yes**
	SB Shared	>500	900	No**
SE Vista Loop Drive East	EB Left	150	50	No
	SB Shared	>500	50	No

*Note: Does not include available storage from the center two way left turn-lane.
**Note: Queue blocks upstream intersection.

Existing US 26 Access Conditions

Part of the facilities inventory effort included the compilation of a comprehensive database of access to US 26 under existing conditions in the study areas, including physical descriptions of driveways and public street intersections, abutting property descriptions and ownerships, legal status of approaches, and delineation of access control. Using this database,

opportunities and constraints for reducing the amount of direct access to US 26 will be identified for use in developing the access management element in a later stage of this project.

Access Inventory

Table A, enclosed in the appendix, contains a physical inventory of existing approaches in the west and east study corridors. The information presented was obtained through field surveys and data supplied by the City of Sandy. Every approach to US 26 was assigned a unique approach number that will be used consistently throughout the development of this plan for identification purposes. The legal status of all existing approaches and access rights of each property abutting US 26 have been compiled and presented in Table B (also enclosed in appendix). Information related to approach permits and grandfathered status was researched at ODOT's District 2C Maintenance office, while access rights and access control locations were provided by ODOT's Right-of-Way unit in Salem.

Approaches were identified as "permitted" where valid approach permits could be reasonably associated with existing approach locations. Existing approaches serving developments constructed prior to 1949 were considered to maintain grandfathered status, which indicates the approach is assumed to have been constructed before the legal requirement to obtain written permission from ODOT was enacted. Approaches that did not qualify for permitted or grandfathered designations were labeled as "unauthorized".

ODOT has previously acquired access control throughout the entire project area. Where access control exists, no right of access between the property and the highway remains, as it may have been acquired or eliminated by law. Where no right of access is present, an application for an approach permit cannot be accepted. Table B identifies all locations within the study corridors where reservations of access remain. Reservations of access represent specific locations where access rights remain, include maximum approach widths allowed, and sometimes include use restrictions. A reservation of access affords the property owner the right to apply for an approach permit, which is reviewed under current ODOT access management regulations (OAR 734-051) but does not guarantee ODOT approval for a driveway at that location for the proposed use of the property. Existing reservations of access can be relocated or slightly modified upon approval from ODOT through a process called an "indenture of access".

To facilitate the use of the information provided in Tables A and B, Figures 3.10A through 3.10F were developed to graphically display key inventory data. The approach numbers shown in these figures correspond to the approach numbers used in Tables A and B.

Opportunities and Constraints

As previously described, the Oregon Highway Plan establishes access management spacing standards for US 26 that reflect the management objectives associated with the Statewide Highway designation. These standards vary depending on the posted speeds and the character of the surrounding land uses. Because the study area includes a short segment designated as an expressway and maintains several posted speed changes, the access management spacing standards for US 26 will vary. Table 3.9 breaks the study area into different zones characterized by changes in access management spacing standards, with the applicable spacing standard for each zone provided.

Table 3.9: Study Area Access Management Spacing Standards

Zone	Highway Segment	Classification	Segment Designation	Urban/ Rural	Posted Speed	Access Spacing Standard
1	MP 22.15 – 22.74	Statewide Hwy	Expressway	Urban	45 - 55 mph	2,640 ft.
2	MP 22.74 – 23.78	Statewide Hwy	Other	Urban	40 - 45 mph	990 ft.
3	MP 23.78 – 23.87	Statewide Hwy	Other	Urban	25 mph	520 ft.
4	MP 24.61 – 24.67	Statewide Hwy	Other	Urban	25 mph	520 ft.
5	MP 24.67 – 25.34	Statewide Hwy	Other	Urban	40 mph	990 ft.
6	MP 25.34 – 26.33	Statewide Hwy	Other	Urban	55 mph	1,320 ft.

Using the physical approach inventory displayed in Table A (see appendix), a comparison of existing conditions to ODOT's access management spacing standards was made to evaluate areas needing improvement. Tables 3.10A and 3.10B provide the results of this investigation, displaying the number of approaches found in the zones identified above for each side of the study highways and comparing the average approach spacing per section to the applicable access management spacing standard. While this level of analysis cannot be used to identify potential improvements to approach spacing, it does reflect the degree to which the spacing standards are being met and provides an indication of the extent of improvements needed.

The rightmost column in the table indicates the approximate number of driveway or public street approaches that would be allowed to fully comply with access spacing standards. Because this type of analysis does not account for access spacing between zone boundaries, the actual numbers shown are not as important as the magnitudes of differences between the actual number of approaches and the number that would be allowed according to the spacing standards.

Table 3.10A: US 26 Existing Westbound (north side of highway) Approach Spacing

Zone	Number of Approaches	Segment Length (ft.)	Average Approach Spacing (ft.)		Number of Approaches Able to Meet Standard
			Actual	Standard	
1	5	3,115	625	2,640	1
2	18	5,490	305	990	5
3	2	475	235	520	1*
4	2	315	110	520	1*
5	10	3,540	355	990	3
6	8	5,225	655	1,320	4
Totals	45	18,160	-	-	15

* Segment Length is shorter than Spacing Standard

Table 3.10B: US 26 Existing Eastbound (south side of highway) Approach Spacing

Zone	Number of Approaches	Segment Length (ft.)	Average Approach Spacing (ft.)		Number of Approaches Able to Meet Standard
			Actual	Standard	
1	3	3,115	1,040	2,640	1
2	12	5,490	460	990	5
3	3	475	160	520	1*
4	3	315	105	520	1*
5	5	3,540	710	990	3
6	11	5,225	475	1,320	4
Totals	37	18,160	-	-	15

* Segment Length is shorter than Spacing Standard

From these tables, it can be seen that the actual average approach spacing in all zones is less than the adopted standards require, leaving much room for improvement. Approach spacing is currently greatest in zones 1 and 5 on the south side of the highway, which are largely characterized by agriculturally-based land uses adjacent to the highway on large lots.

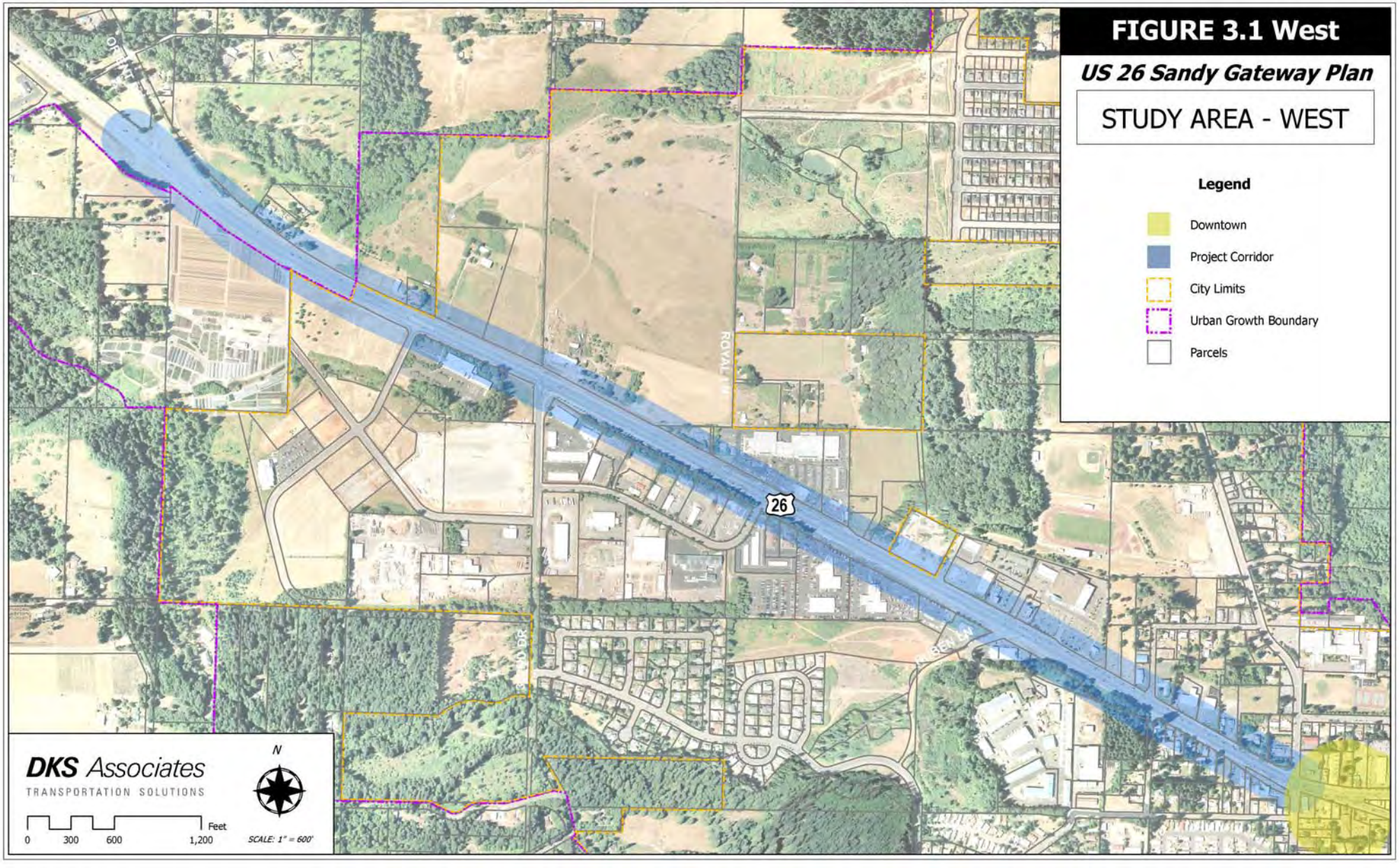


FIGURE 3.1 West
US 26 Sandy Gateway Plan
STUDY AREA - WEST
Legend
Downtown
Project Corridor
City Limits
Urban Growth Boundary
Parcels
26
ROYAL AVE
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

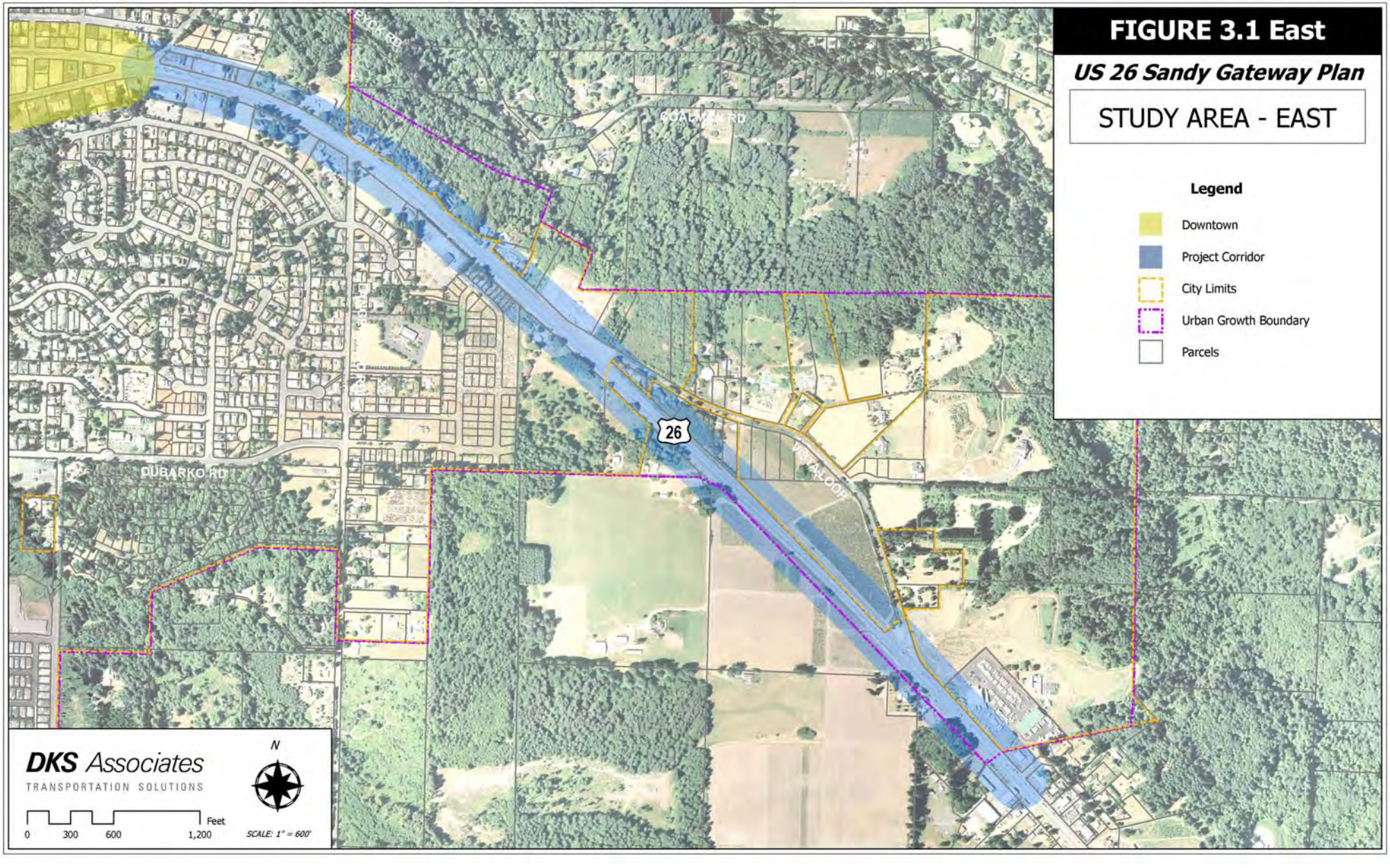


FIGURE 3.1 East
US 26 Sandy Gateway Plan
STUDY AREA - EAST
Legend
Downtown
Project Corridor
City Limits
Urban Growth Boundary
Parcels
26
DUBARKO RD
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

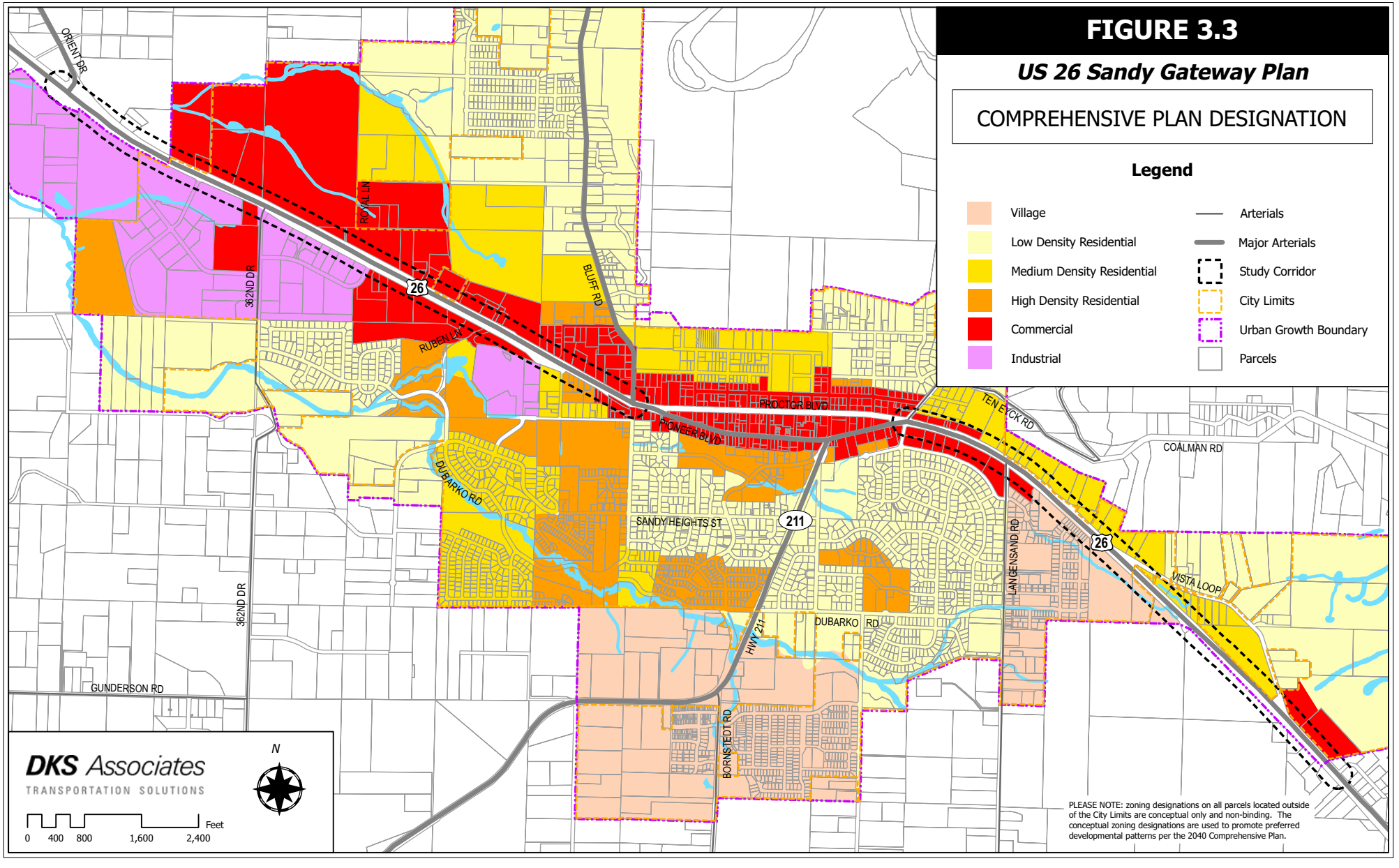


FIGURE 3.3
US 26 Sandy Gateway Plan
COMPREHENSIVE PLAN DESIGNATION
Legend
Village
Low Density Residential
Medium Density Residential
High Density Residential
Commercial
Industrial
Arterials
Major Arterials
Study Corridor
City Limits
Urban Growth Boundary
Parcels
ORIENT DR
362ND DR
ROYAL LN
BLUFF RD
RUBEN LN
PROCTOR BLVD
PIONEER BLVD
TEN EYCK RD
COALMAN RD
DUBARKO RD
SANDY HEIGHTS ST
211
LANGENSAND RD
VISTA LOOP
DUBARKO RD
HWY 211
BORNSTEDT RD
GUNDERSON RD
26
DKS Associates
TRANSPORTATION SOLUTIONS
N
0 400 800 1,600 2,400 Feet
PLEASE NOTE: zoning designations on all parcels located outside of the City Limits are conceptual only and non-binding. The conceptual zoning designations are used to promote preferred developmental patterns per the 2040 Comprehensive Plan.

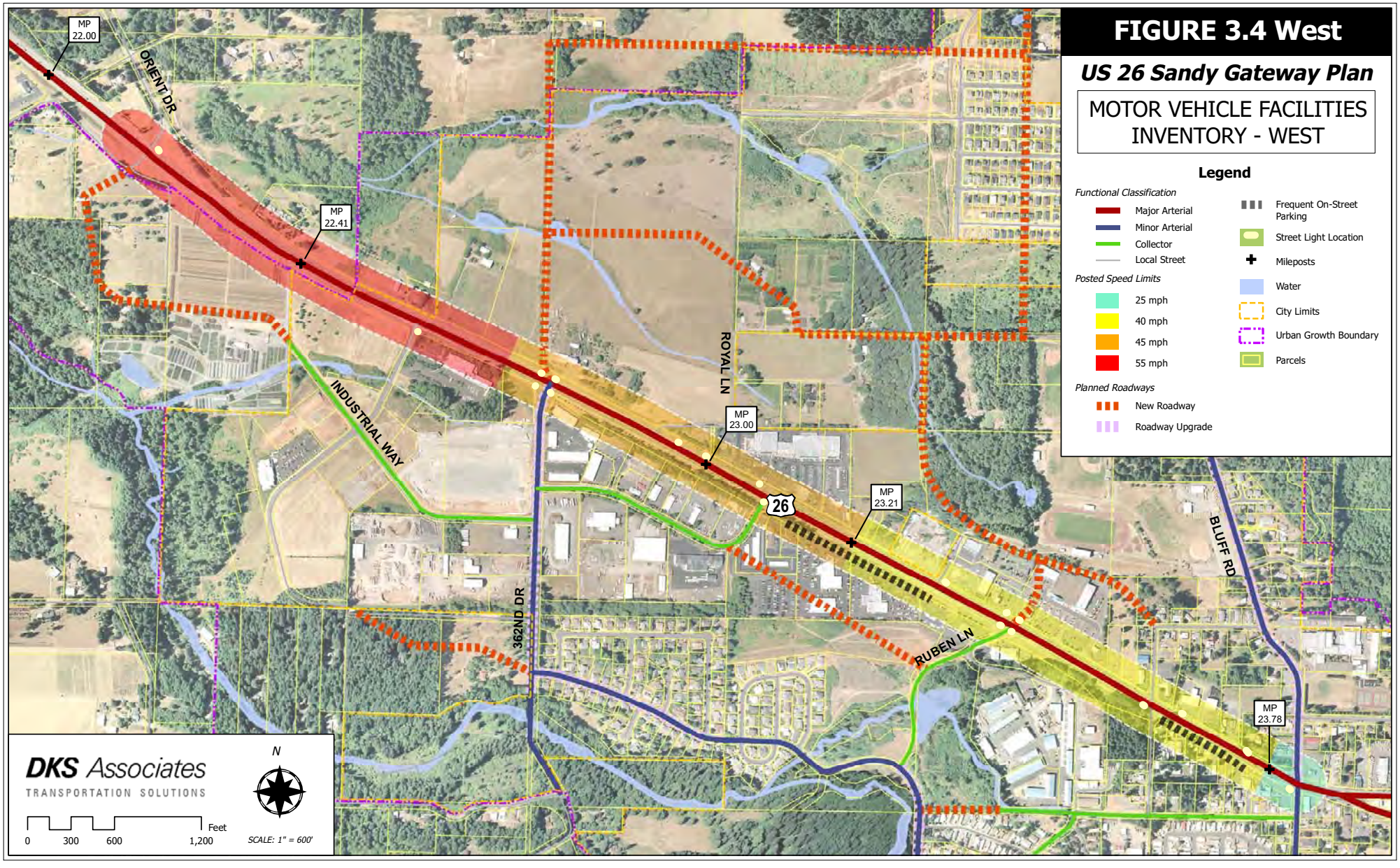


FIGURE 3.4 West
US 26 Sandy Gateway Plan
MOTOR VEHICLE FACILITIES INVENTORY - WEST
Legend
Functional Classification
Major Arterial
Minor Arterial
Collector
Local Street
Posted Speed Limits
25 mph
40 mph
45 mph
55 mph
Planned Roadways
New Roadway
Roadway Upgrade
Frequent On-Street Parking
Street Light Location
Mileposts
Water
City Limits
Urban Growth Boundary
Parcels
MP 22.00
MP 22.41
MP 23.00
MP 23.21
MP 23.78
ORIENT DR
INDUSTRIAL WAY
ROYAL LN
362ND DR
RUBEN LN
BLUFF RD
26
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

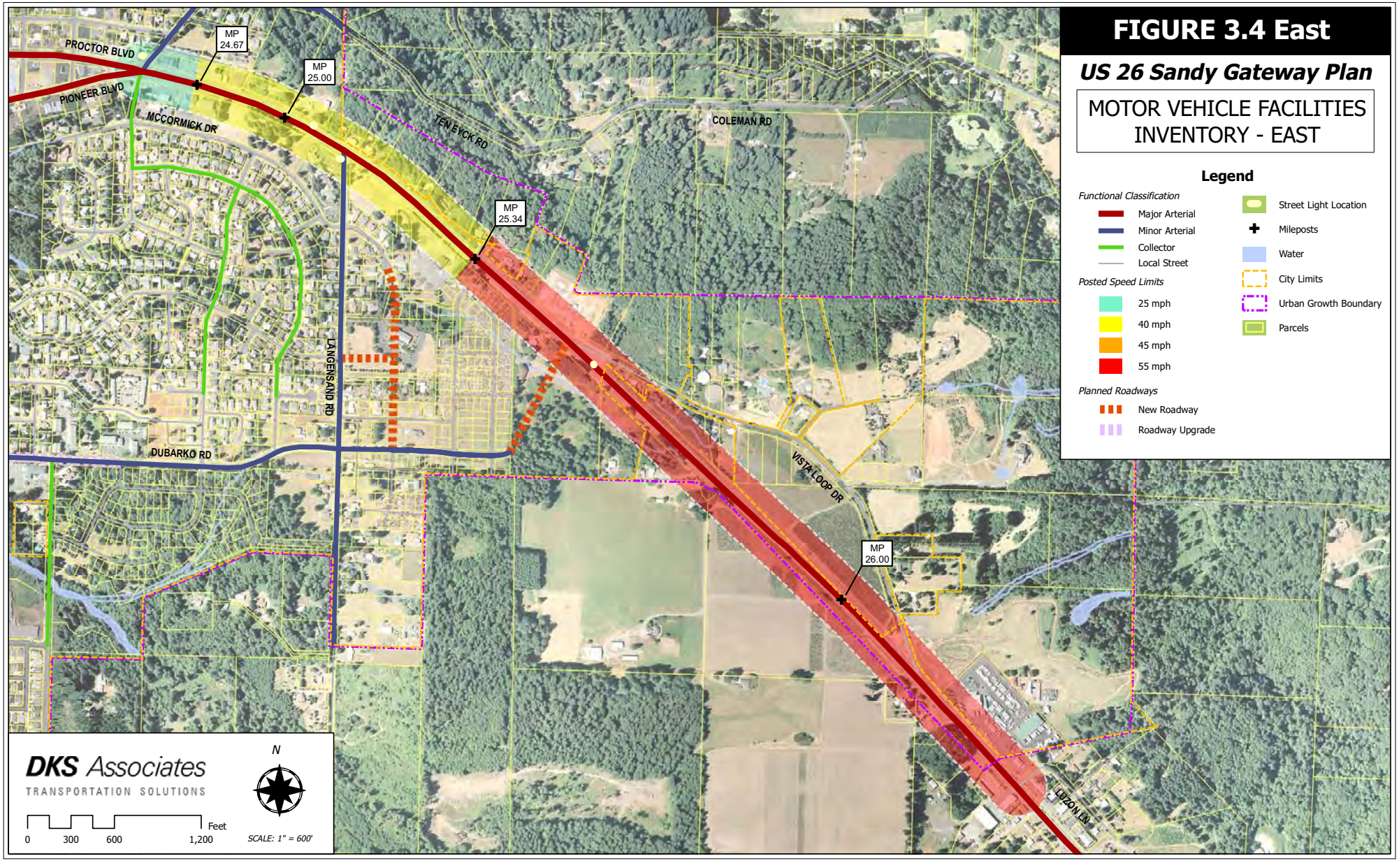


FIGURE 3.4 East
US 26 Sandy Gateway Plan
MOTOR VEHICLE FACILITIES INVENTORY - EAST
Legend
Functional Classification
Major Arterial
Minor Arterial
Collector
Local Street
Posted Speed Limits
25 mph
40 mph
45 mph
55 mph
Planned Roadways
New Roadway
Roadway Upgrade
Street Light Location
Mileposts
Water
City Limits
Urban Growth Boundary
Parcels
PROCTOR BLVD
PIONEER BLVD
MCCORMICK DR
TEN EYCK RD
COLEMAN RD
LANGENSAND RD
DUBARKO RD
VISTA LOOP DR
LUZON LN
MP 24.67
MP 25.00
MP 25.34
MP 26.00
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

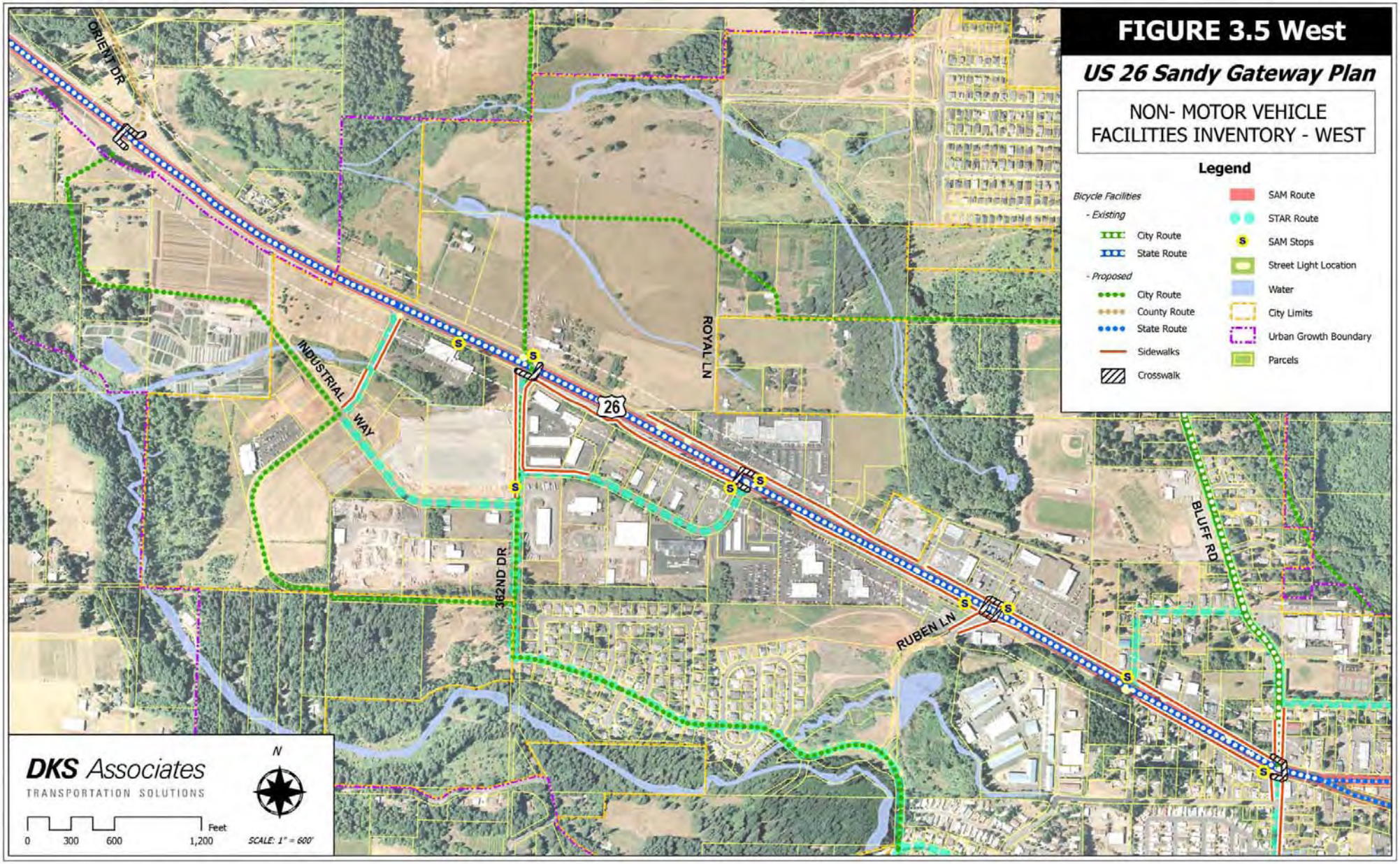


FIGURE 3.5 West
US 26 Sandy Gateway Plan
NON- MOTOR VEHICLE FACILITIES INVENTORY - WEST
Legend
Bicycle Facilities
- Existing
City Route
State Route
- Proposed
City Route
County Route
State Route
Sidewalks
Crosswalk
SAM Route
STAR Route
SAM Stops
Street Light Location
Water
City Limits
Urban Growth Boundary
Parcels
ORIENT DR
INDUSTRIAL WAY
ROYAL LN
362ND DR
RUBEN LN
BLUFF RD
26
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

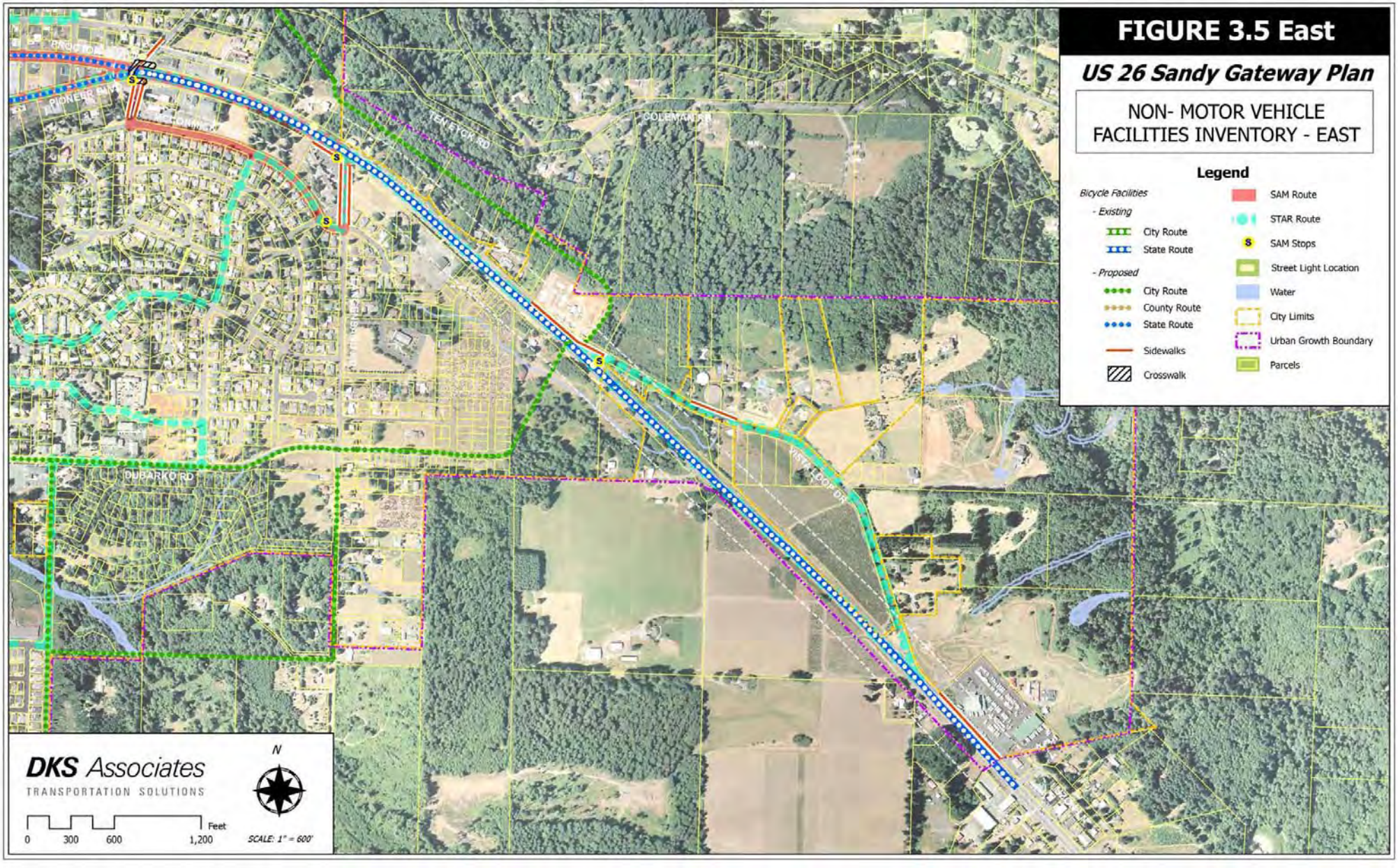


FIGURE 3.5 East
US 26 Sandy Gateway Plan
NON- MOTOR VEHICLE FACILITIES INVENTORY - EAST
Legend
Bicycle Facilities
- Existing
City Route
State Route
- Proposed
City Route
County Route
State Route
Sidewalks
Crosswalk
SAM Route
STAR Route
SAM Stops
Street Light Location
Water
City Limits
Urban Growth Boundary
Parcels
PIONEER BLVD
TEN EYCK RD
COLEMAN DR
DUBARKO RD
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

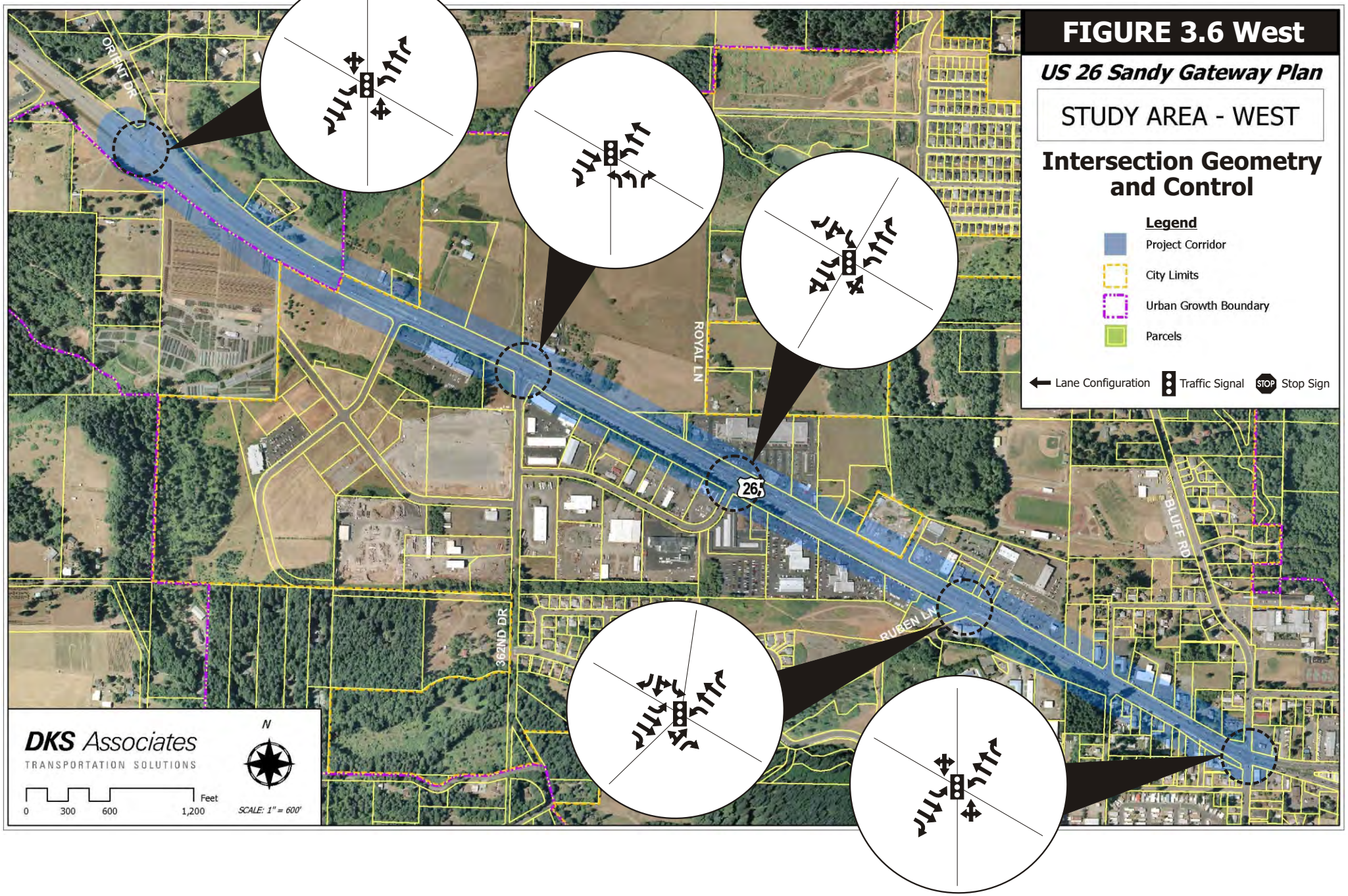


FIGURE 3.6 West
US 26 Sandy Gateway Plan
STUDY AREA - WEST
Intersection Geometry and Control
Legend
Project Corridor
City Limits
Urban Growth Boundary
Parcels
Lane Configuration
Traffic Signal
Stop Sign
ORIENT DR
ROYAL LN
362ND DR
RUBEN LN
BLUFF RD
26
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

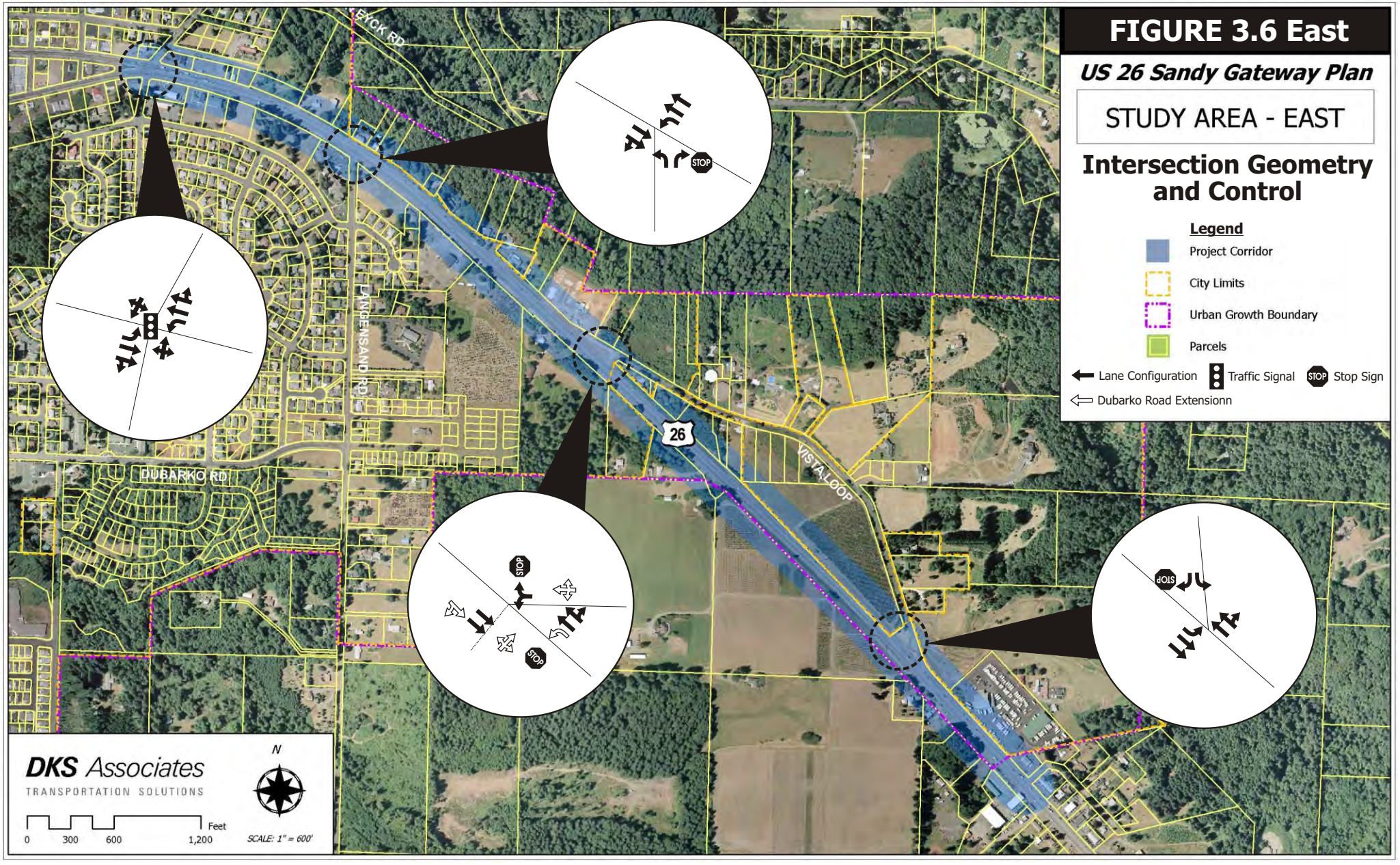


FIGURE 3.6 East
US 26 Sandy Gateway Plan
STUDY AREA - EAST
Intersection Geometry and Control
Legend
Project Corridor
City Limits
Urban Growth Boundary
Parcels
Lane Configuration
Traffic Signal
Stop Sign
Dubarko Road Extensionn
EYCK RD
DUBARKO RD
LANGENSAND RD
VISTA LOOP
26
STOP
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

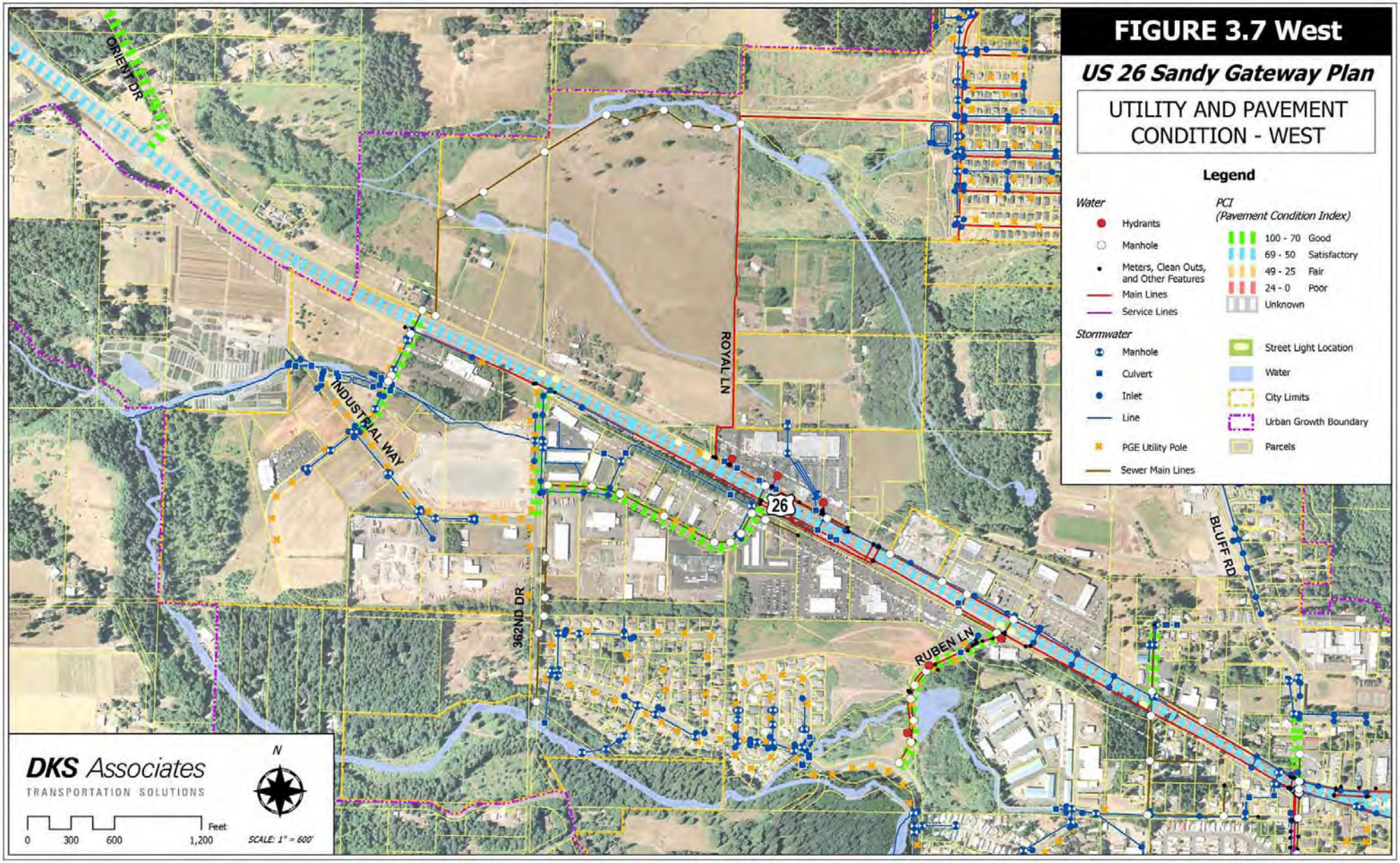


FIGURE 3.7 West
US 26 Sandy Gateway Plan
UTILITY AND PAVEMENT CONDITION - WEST
Legend
Water
Hydrants
Manhole
Meters, Clean Outs, and Other Features
Main Lines
Service Lines
PCI (Pavement Condition Index)
100 - 70 Good
69 - 50 Satisfactory
49 - 25 Fair
24 - 0 Poor
Unknown
Stormwater
Manhole
Culvert
Inlet
Line
PGE Utility Pole
Sewer Main Lines
Street Light Location
Water
City Limits
Urban Growth Boundary
Parcels
ORIENT DR
INDUSTRIAL WAY
ROYAL LN
362ND DR
26
BLUFF RD
RUBEN LN
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

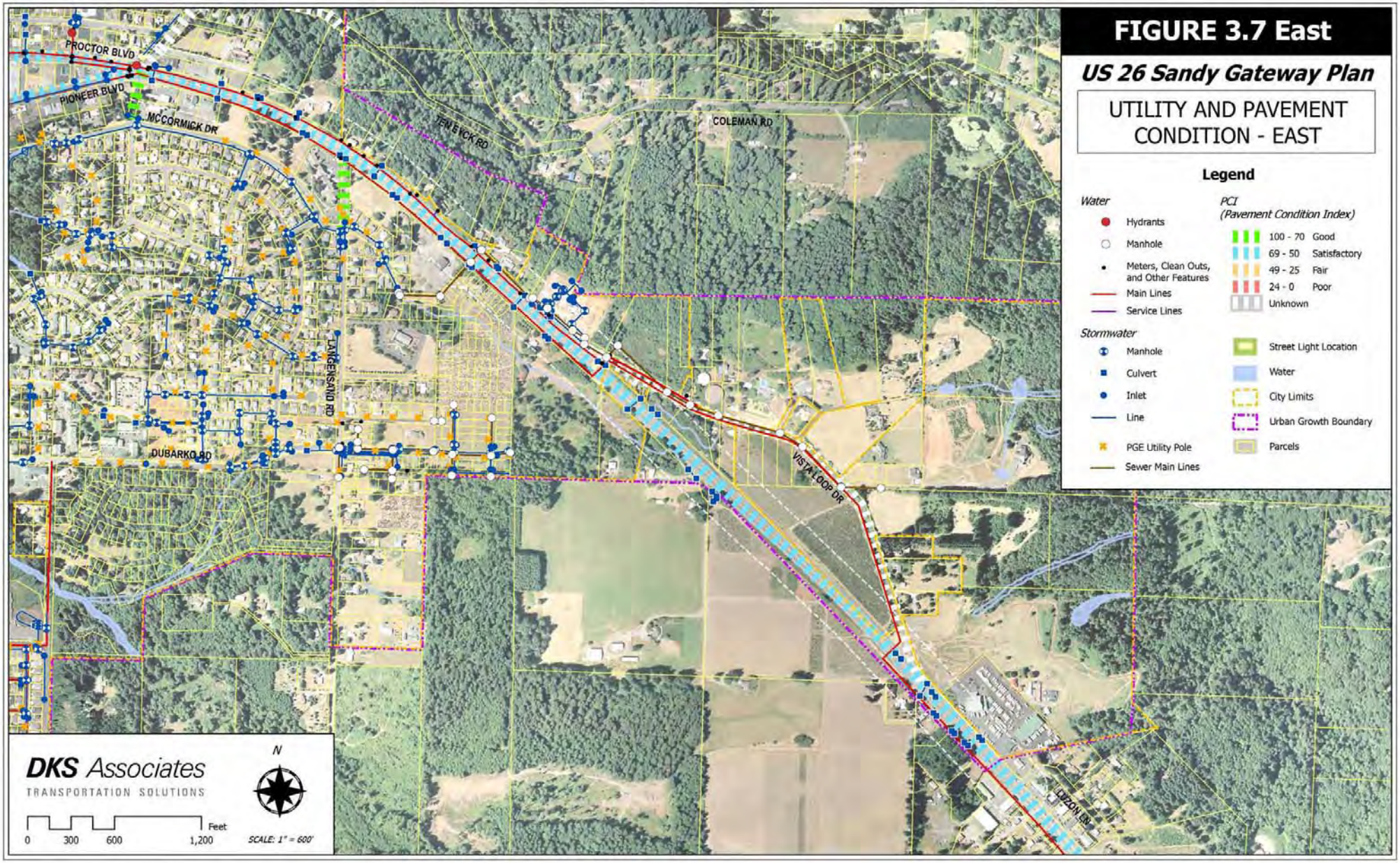


FIGURE 3.7 East

US 26 Sandy Gateway Plan

UTILITY AND PAVEMENT CONDITION - EAST

Legend

Water
- Hydrants
- Manhole
- Meters, Clean Outs, and Other Features
- Main Lines
- Service Lines

Stormwater
- Manhole
- Culvert
- Inlet
- Line
- PGE Utility Pole
- Sewer Main Lines

PCI (Pavement Condition Index)
- 100 - 70 Good
- 69 - 50 Satisfactory
- 49 - 25 Fair
- 24 - 0 Poor
- Unknown

- Street Light Location
- Water
- City Limits
- Urban Growth Boundary
- Parcels

DKS Associates
TRANSPORTATION SOLUTIONS

N

0 300 600 1,200 Feet

SCALE: 1" = 600'

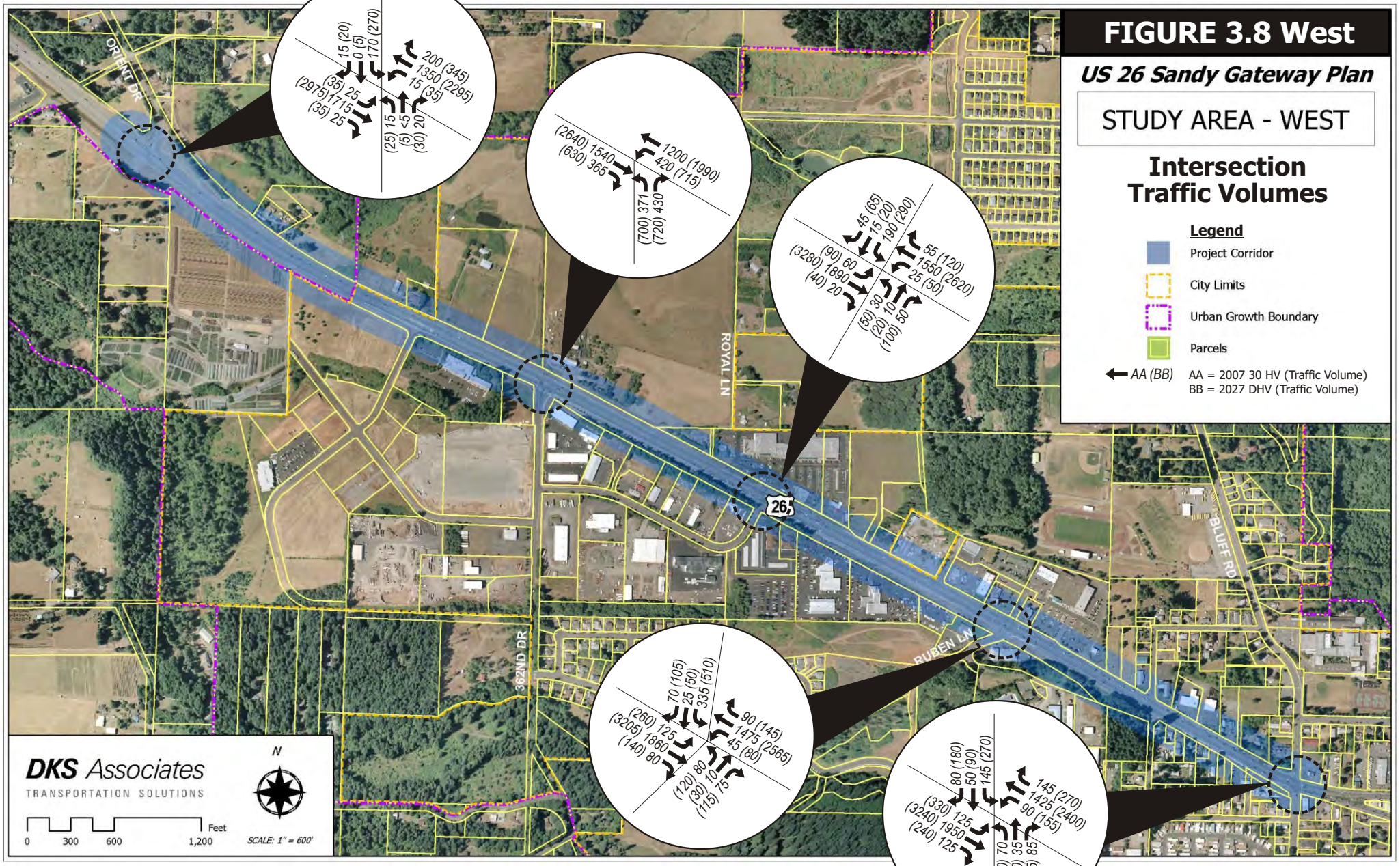


FIGURE 3.8 West
US 26 Sandy Gateway Plan
STUDY AREA - WEST
Intersection Traffic Volumes
Legend
Project Corridor
City Limits
Urban Growth Boundary
Parcels
AA (BB)
AA = 2007 30 HV (Traffic Volume)
BB = 2027 DHV (Traffic Volume)
ORIENT DR
ROYAL LN
362ND DR
RUBEN LN
BLUFF RD
26
15 (20)
0 (5)
170 (270)
(35) 25
(2975) 1715
(35) 25
200 (345)
1350 (2295)
15 (35)
(25) 15
(5) <5
(30) 20
(2640) 1540
(630) 365
1200 (1990)
420 (715)
(700) 371
(720) 430
45 (65)
15 (20)
190 (290)
(90) 60
(3280) 1890
(40) 20
55 (120)
1550 (2620)
25 (50)
(50) 30
(20) 10
(100) 50
70 (105)
25 (50)
335 (510)
(260) 125
(3205) 1860
(140) 80
90 (145)
1475 (2565)
45 (80)
(120) 80
(30) 10
(115) 75
80 (180)
50 (90)
145 (270)
(330) 125
(3240) 1950
(240) 125
145 (270)
1425 (2400)
90 (155)
(170) 70
(60) 35
(145) 85
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

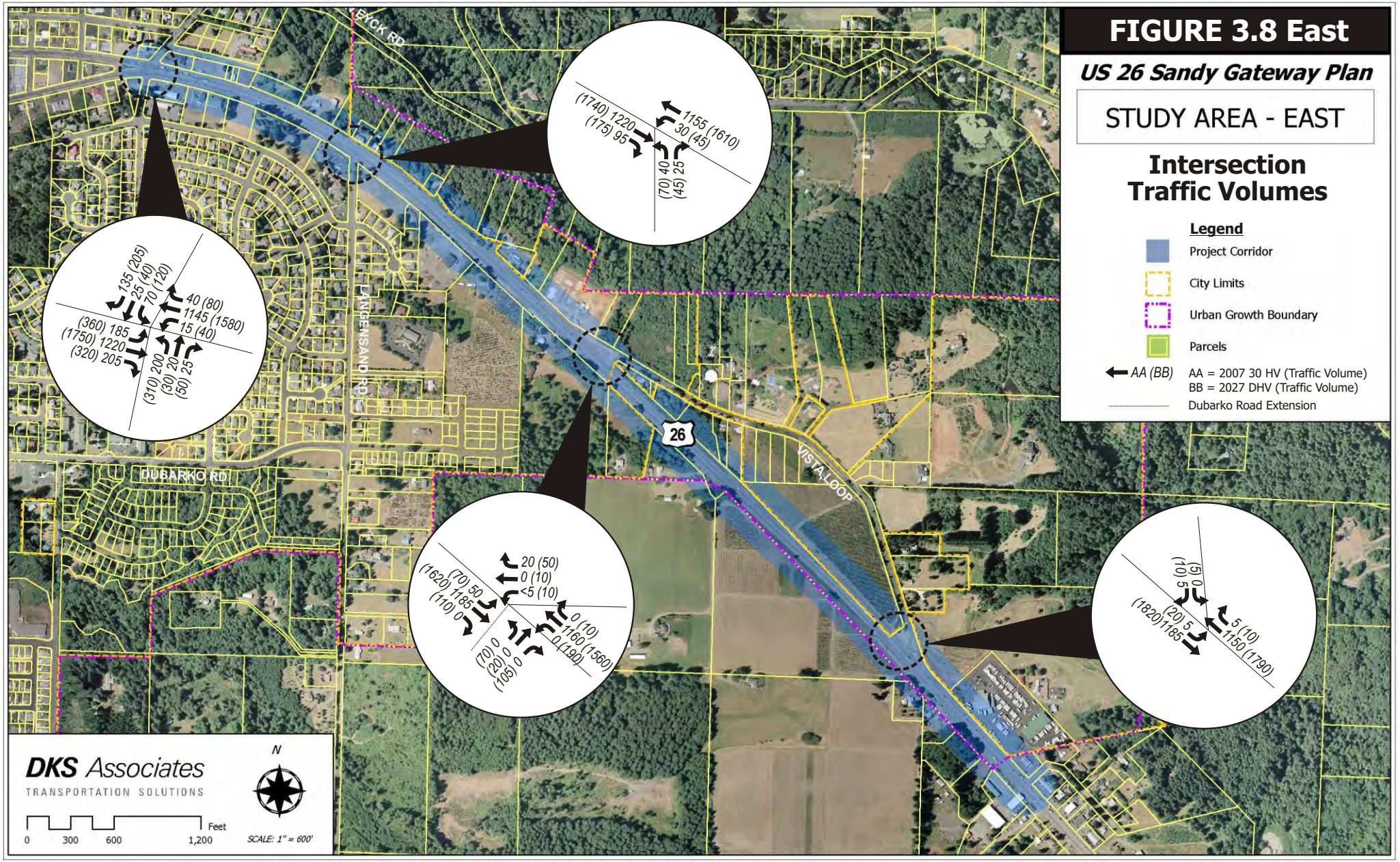


FIGURE 3.8 East
US 26 Sandy Gateway Plan
STUDY AREA - EAST
Intersection Traffic Volumes
Legend
Project Corridor
City Limits
Urban Growth Boundary
Parcels
AA (BB)
AA = 2007 30 HV (Traffic Volume)
BB = 2027 DHV (Traffic Volume)
Dubarko Road Extension
DUBARKO RD
LANGENSAND RD
VISTA LOOP
26
(1740) 1220
(175) 95
1155 (1610)
30 (45)
(70) 40
(45) 25
135 (205)
25 (40)
70 (120)
(360) 185
(1750) 1220
(320) 205
40 (80)
1145 (1580)
15 (40)
(310) 200
(30) 20
(50) 25
(1620) 1185
(70) 50
(110) 0
20 (50)
0 (10)
<5 (10)
0 (10)
1160 (1560)
0 (190)
(70) 0
(20) 0
(105) 0
(1820) 1185
(20) 5
(10) 5
(5) 0
5 (10)
1150 (1790)
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

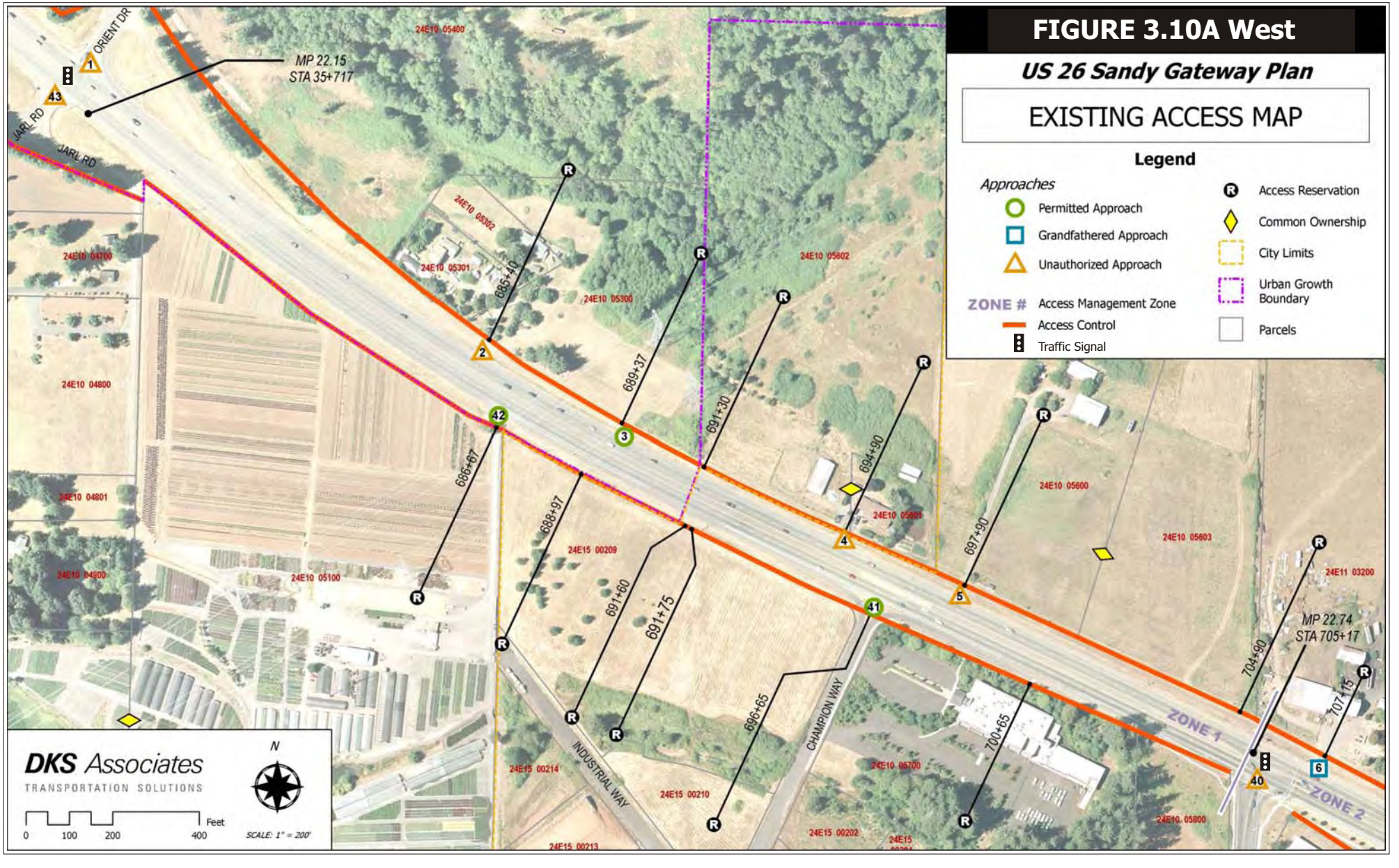


FIGURE 3.10A West
US 26 Sandy Gateway Plan
EXISTING ACCESS MAP
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
ZONE # Access Management Zone
Access Control
Traffic Signal
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
MP 22.15
STA 35+717
MP 22.74
STA 705+17
ORIENT DR
JARL RD
INDUSTRIAL WAY
CHAMPION WAY
ZONE 1
ZONE 2
685+40
689+37
691+30
694+90
697+90
686+67
688+97
691+60
691+75
696+65
700+65
704+90
707+15
DKS Associates
TRANSPORTATION SOLUTIONS
N
0 100 200 400 Feet
SCALE: 1" = 200'

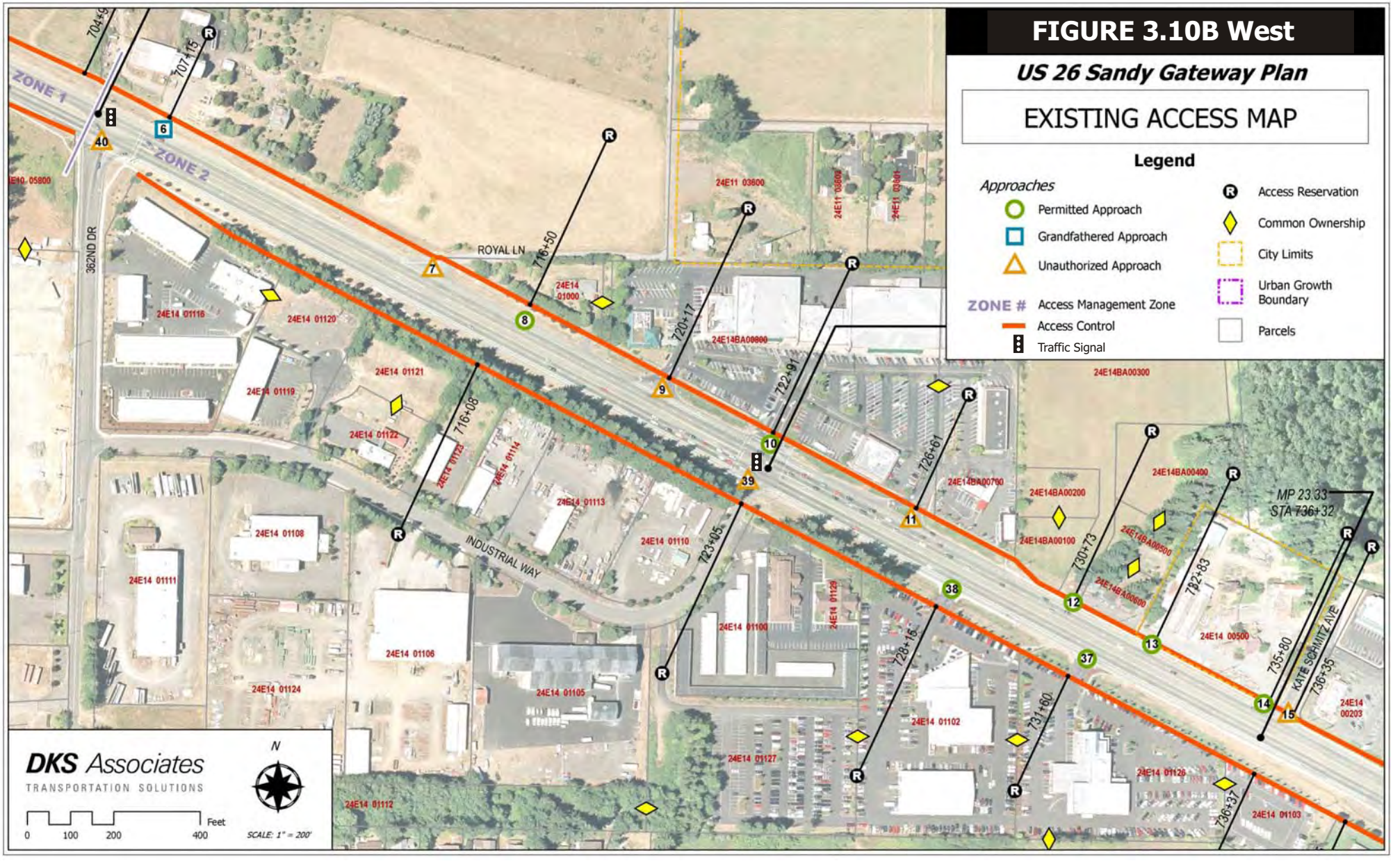


FIGURE 3.10B West
US 26 Sandy Gateway Plan
EXISTING ACCESS MAP
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
ZONE # Access Management Zone
Access Control
Traffic Signal
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
ZONE 1
ZONE 2
362ND DR
ROYAL LN
INDUSTRIAL WAY
KATE SCHMITZ AVE
MP 23.33
STA 736+32
704+95
707+15
716+50
716+08
720+17
722+91
723+05
726+61
728+16
730+73
731+60
735+80
736+35
736+37
782+83
DKS Associates
TRANSPORTATION SOLUTIONS
N
0 100 200 400 Feet
SCALE: 1" = 200'

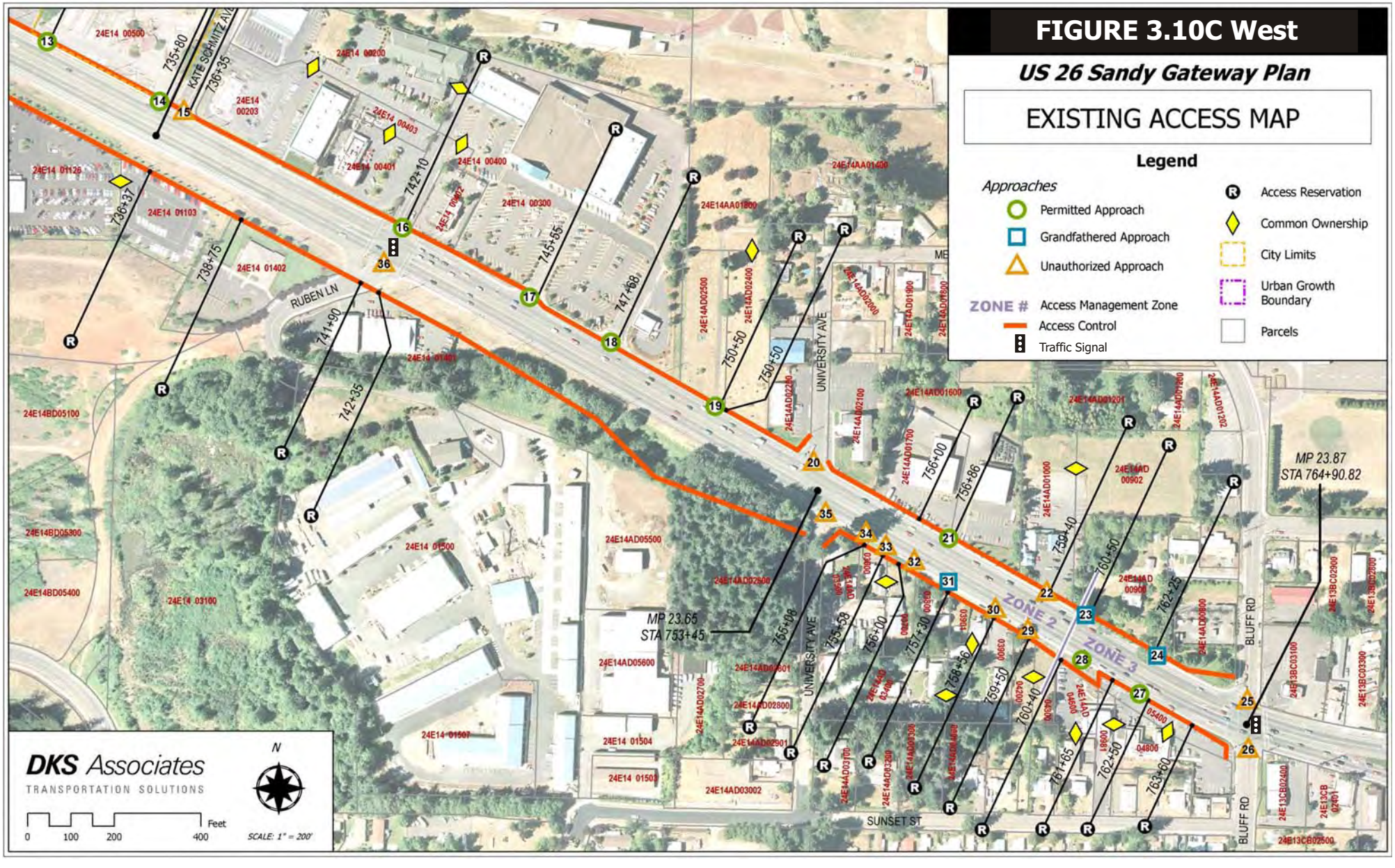


FIGURE 3.10C West
US 26 Sandy Gateway Plan
EXISTING ACCESS MAP
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
ZONE # Access Management Zone
Access Control
Traffic Signal
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
RUBEN LN
UNIVERSITY AVE
KATE SCHMITZ AVE
BLUFF RD
SUNSET ST
ZONE 2
ZONE 3
MP 23.65
STA 753+45
MP 23.87
STA 764+90.82
DKS Associates
TRANSPORTATION SOLUTIONS
N
0 100 200 400 Feet
SCALE: 1" = 200'

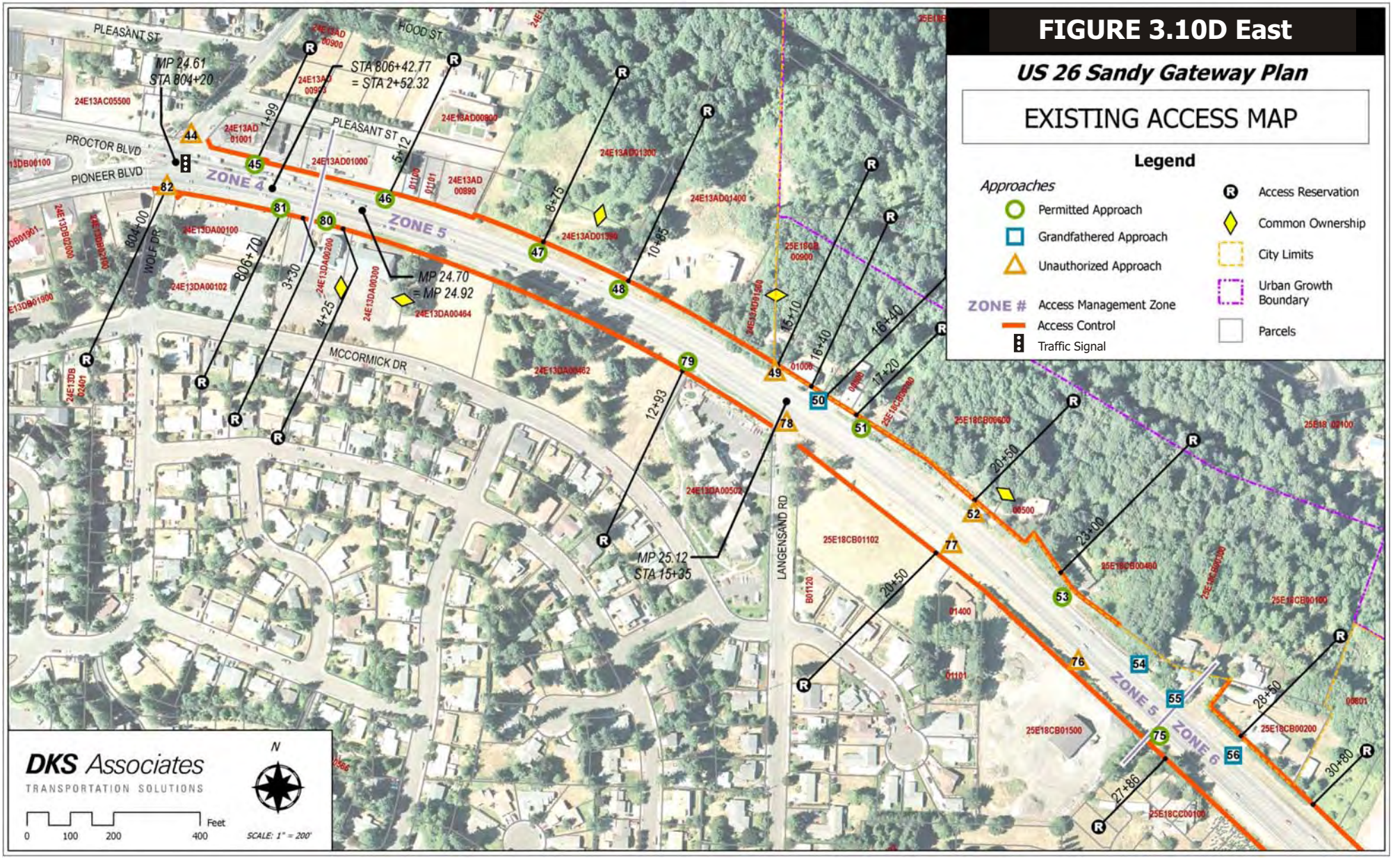


FIGURE 3.10D East
US 26 Sandy Gateway Plan
EXISTING ACCESS MAP
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
ZONE # Access Management Zone
Access Control
Traffic Signal
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
PLEASANT ST
HOOD ST
PROCTOR BLVD
PIONEER BLVD
WOLF DR
MCCORMICK DR
LANGENSAND RD
ZONE 4
ZONE 5
ZONE 6
MP 24.61
STA 804+20
STA 806+42.77
= STA 2+52.32
MP 24.70
= MP 24.92
MP 25.12
STA 15+35
DKS Associates
TRANSPORTATION SOLUTIONS
N
0 100 200 400 Feet
SCALE: 1" = 200'

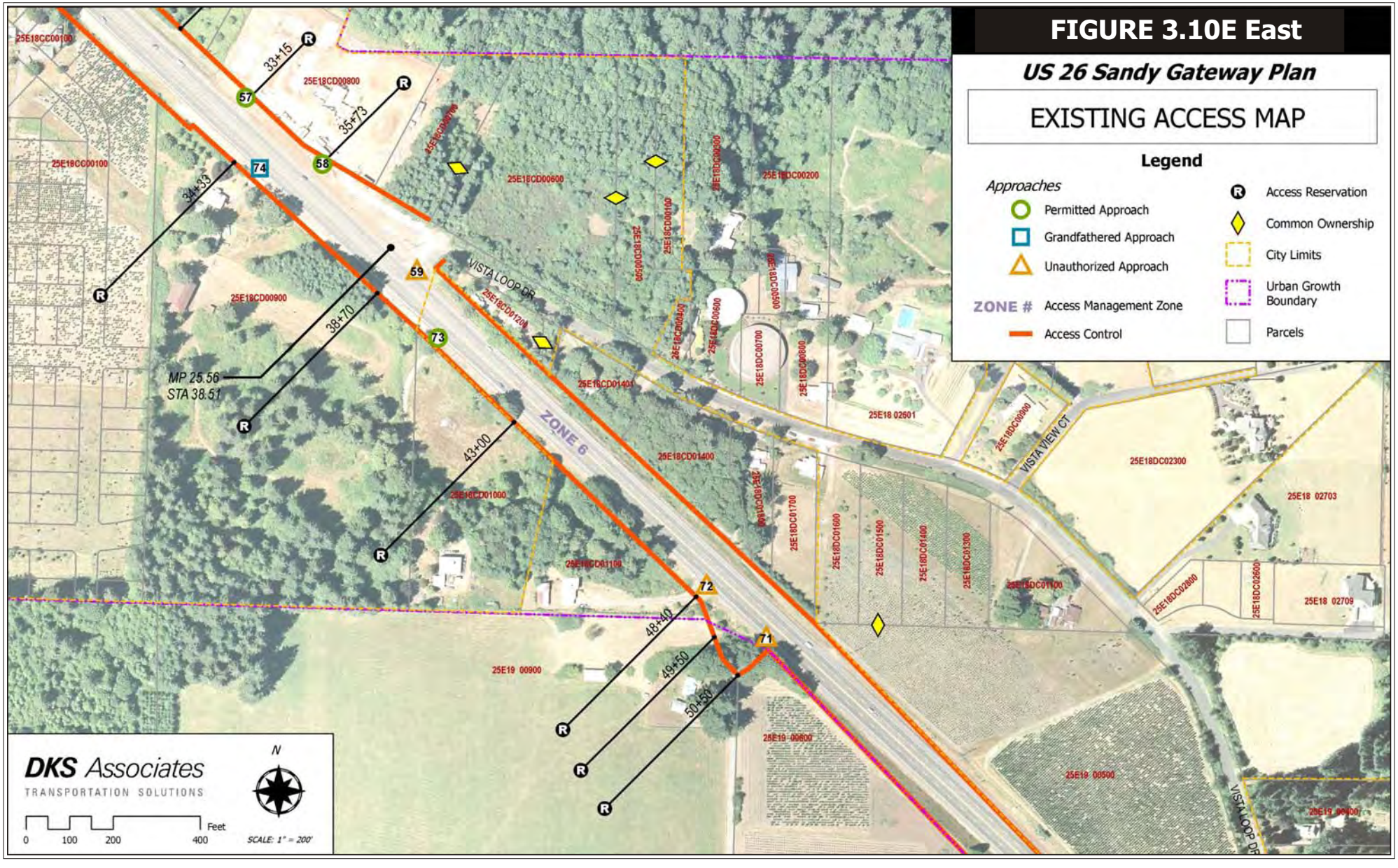


FIGURE 3.10E East
US 26 Sandy Gateway Plan
EXISTING ACCESS MAP
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
ZONE # Access Management Zone
Access Control
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
33+15
35+73
34+33
38+70
43+00
48+40
49+50
50+50
MP 25.56
STA 38.51
ZONE 6
VISTA LOOP DR
VISTA VIEW CT
DKS Associates
TRANSPORTATION SOLUTIONS
N
0 100 200 400 Feet
SCALE: 1" = 200'

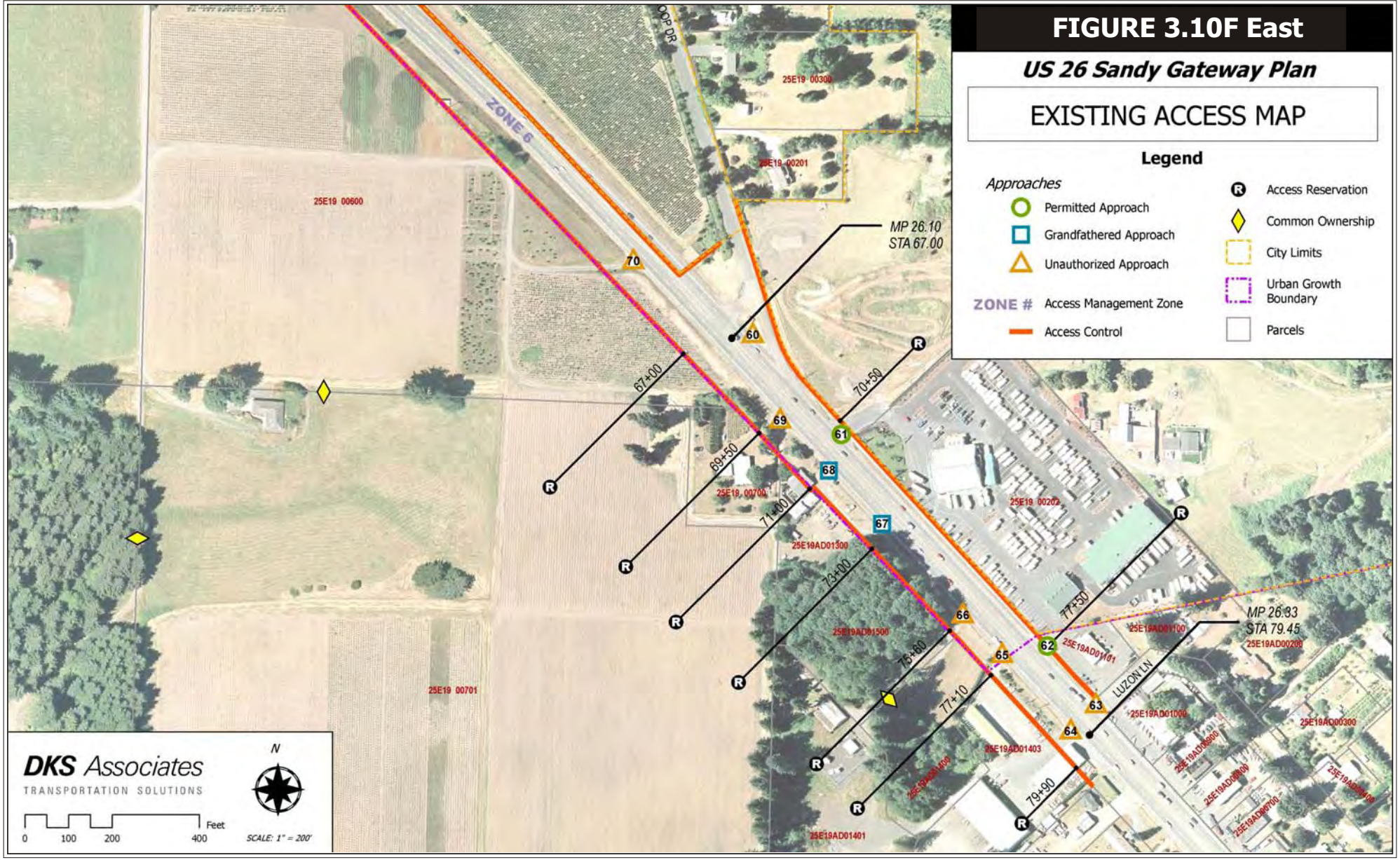


FIGURE 3.10F East
US 26 Sandy Gateway Plan
EXISTING ACCESS MAP
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
ZONE # Access Management Zone
Access Control
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
ZONE 6
MP 26.10
STA 67.00
MP 26.33
STA 79.45
67+00
69+50
71+00
73+00
75+60
77+10
79+90
70+50
77+50
LUZON LN
25E19 00600
25E19 00300
25E19 00201
25E19 00700
25E19 00202
25E19 00701
25E19AD01300
25E19AD01500
25E19AD01100
25E19AD01101
25E19AD00200
25E19AD01000
25E19AD00300
25E19AD01403
25E19AD01401
DKS Associates
TRANSPORTATION SOLUTIONS
N
Feet
0 100 200 400
SCALE: 1" = 200'

4. Needs Assessment

Overview

This chapter provides a summary of deficiencies identified in the US 26 west and east study corridors through the previously described effort to inventory and analyze existing and planned transportation conditions through the year 2027. Deficiencies are discussed by category below, with summary maps illustrating the deficiencies noted by location in Figures 4.1 West and East.

To initiate the discussion on selection of potential mitigation measures to address the identified deficiencies, a toolbox of common improvement types was compiled and has been included in the appendix for reference.

Roadway Design & Capacity

- Shoulder widths between Langensand Road and Luzon Lane vary in width, getting as narrow as four feet. To comply width ODOT's design standards from the 2003 Highway Design Manual for Urban Fringe/Suburban Areas, shoulders should be a minimum of six feet wide where the posted speed is 40 mph and a minimum of eight feet wide where the posted speed is 55 mph.
- Significant portions of the study corridors, especially the west study corridor, have two-way left turn lanes in the highway median. Given the high travel speeds, high access density, need for pedestrian crossing enhancements, and the fatal crash that appears to have been related to a conflict in the two-way left turn lane, treatments to reduce conflicts in the median should be investigated.
- Most study intersections are currently performing poorly during the peak travel periods, resulting in long delays and vehicle queues. In the future, this congestion will only increase without needed capacity enhancements along US 26.
- The curb radius on the southwest corner of the US 26/Wolf Drive intersection appears to be too small. Vehicles were observed to have difficulty negotiating it and were required to significantly reduce their speed. Visible tire tracks were seen on the sidewalk and wheelchair ramp.
- The recommended highway cross-section for US 26 from the 1995 City of Sandy Transportation System Plan was reviewed for consistency with current ODOT design standards and feasibility of implementation given area constraints. The

recommended cross-section would require at least 92 feet of right-of-way, with 72 feet of paved surface between the curbs. Individual elements include:

- 14' median turn lane,
- Four 12' travel lanes (two of which are noted as optional),
- Two 5' bike lanes (both noted as optional),
- Two 5' planting strips, and
- Two 5' sidewalks.

While there is sufficient highway right-of-way available in the study area corridors, with over 100 feet of right-of-way present throughout, current design standards from ODOT's 2003 Highway Design Manual for Urban Fringe/ Suburban highways requires medians 16 to 19 feet in width, right shoulder/bike lanes of six to eight feet in width, and sidewalks of at least six feet in width. Under the new standards, the typical cross-section would be as great as 105 feet wide, which would still fit within the available right-of-way.

Pedestrian

- There are gaps in the existing sidewalk system within the study corridors. Areas where sidewalk infill is needed include:

<u>North side of US 26</u>

- From Orient Drive to Royal Lane;
- From Ten Eyck Road to approximately 600 feet west of Vista Loop Drive West;
- From Vista Loop Drive West to approximately 200 feet east of Vista Loop Drive East; and
- From approximately 150 feet west of Luzon Lane to Luzon Lane.

<u>South side of US 26</u>

- From Jarl Road to approximately 900 feet west of Champion Way;
- From Industrial Way to approximately 285 feet to the east;
- From approximately 175 feet east of Ruben Lane to University Avenue;
- From Wolf Drive to approximately 300 feet west of Langensand Road; and
- From Langensand Road to Luzon Lane.

- The distances between pedestrian crossing opportunities along US 26 are very long, encouraging unprotected mid-block crossings and use of the continuous two-way left turn lane as a refuge, and acting as a barrier by discouraging crossings altogether. Furthermore, most signalized intersections that do provide protected crossing opportunities only have crosswalks on one side of the intersection, which lessens convenience.
- A utility pole is located in the middle of the sidewalk on the south side of US 26, just west of the intersection with Bluff Road, obstructing the walkway and leaving it virtually impassible by wheelchair.

Bicycle

- According to the 1995 Oregon Bicycle and Pedestrian Plan, bicycle lanes should be five to six feet wide, while the recommended width for bicycle shoulders is six feet, with a minimum of four feet allowed where physical limitations are present. However, when adjacent to a curb, guardrail, or other roadside barrier, a minimum bicycle shoulder width of five feet must be used.

  There are several areas in the east study corridor where bicycle shoulders are only the minimum four feet in width. Furthermore, within some of these areas, the bicycle shoulder is bounded by curb or guardrail, making it substandard. Areas with minimal and substandard bicycle shoulder widths are listed below.

  Minimal four feet of width provided

  - North side of US 26 from Langensand Road to approximately 850 feet east of Vista Loop Drive West (MP 25.12 to MP 25.27);
  - North side of US 26 from approximately 700 feet west of Vista Loop Drive East to Luzon Lane (MP 26.00 to MP 26.33);
  - South side of US 26 from Langensand Road to approximately 850 feet east of Vista Loop Drive West (MP 25.12 to MP 25.27); and
  - South side of US 26 from approximately 700 feet west of Vista Loop Drive East to Luzon Lane (MP 26.00 to MP 26.33).

  Substandard, with minimal four feet of width provided next to curb or guardrail

  - North side of US 26, 200-foot section (MP 25.27 to MP 25.31) between Langensand Road and Vista Loop Drive West (guardrail);
  - North side of US 26, 685-foot section (MP 25.43 to MP 25.56) between Langensand Road and Vista Loop Drive West (curb);

- North side of US 26, 580-foot section (MP 26.16 to MP 26.27) between Vista Loop Drive East and Luzon Lane (curb); and
- South side of US 26, 685-foot section (MP 25.39 to MP 25.52) between Langensand Road and Vista Loop Drive West (guardrail).

Transit

- Additional amenities, such as benches and shelters, are needed at area bus stops. Waiting passengers were seen standing in ditches and seated on nearby rocks and utility cabinets.
- Considering the limited capacity on the highway and the high travel speeds, the construction of bus pullouts should be considered at locations of bus stops.
- Many bus stops are currently located on the near side of signalized intersections, without bus pullouts provided. In many cases, the stopped bus blocks a right turn lane (e.g. eastbound at Industrial Way, eastbound and westbound at Ruben Lane, eastbound at Bluff Road, eastbound at Wolf Drive, and eastbound at Langensand Road). Moving these stops to the far side of the intersections and constructing bus pullouts may improve system capacity.

Access

- The spacing between approaches to US 26 is much shorter than ODOT's access management spacing standards require, which is largely due to the number of private approaches. In fact, no existing private approach in either study corridor currently meets spacing standards. Spacing between public approaches, which should act as the framework for all access on US 26, is much better with only Champion Way (1,650 feet from standard spacing) and Luzon Lane (50 feet from standard spacing) failing to meet spacing standards.
- The approach on the north side of US 26 at Royal Lane (private road) is very wide with the exiting left and right turn lanes separated by a wide painted island. Tire marks indicate that entering vehicles are cutting through the island and exiting left turn lane, which is potentially hazardous. The design of this approach should be improved.

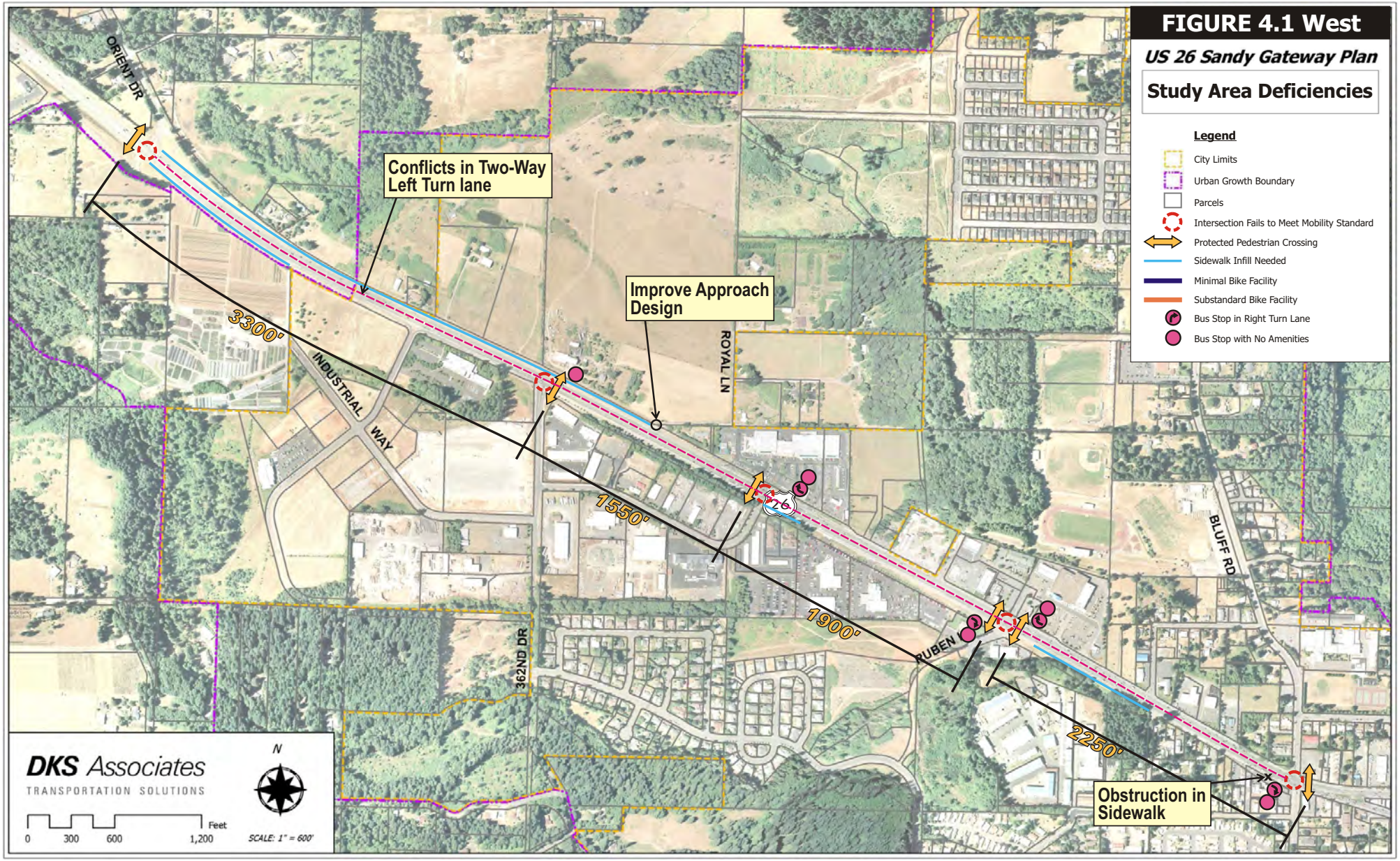


FIGURE 4.1 West
US 26 Sandy Gateway Plan
Study Area Deficiencies
Legend
City Limits
Urban Growth Boundary
Parcels
Intersection Fails to Meet Mobility Standard
Protected Pedestrian Crossing
Sidewalk Infill Needed
Minimal Bike Facility
Substandard Bike Facility
Bus Stop in Right Turn Lane
Bus Stop with No Amenities
Conflicts in Two-Way Left Turn lane
Improve Approach Design
Obstruction in Sidewalk
3300'
1550'
1900'
2250'
ORIENT DR
INDUSTRIAL WAY
ROYAL LN
BLUFF RD
362ND DR
RUBEN
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

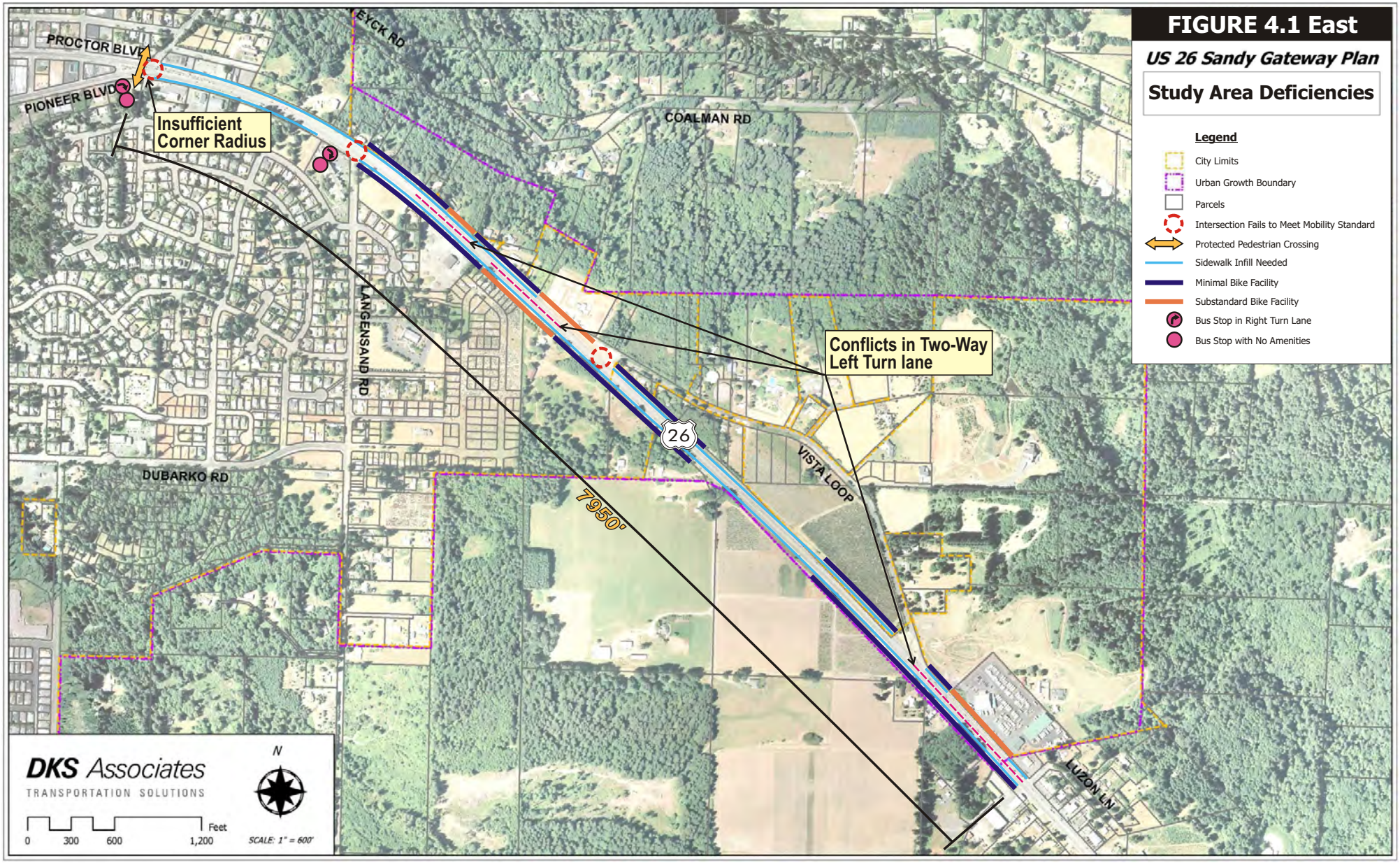


FIGURE 4.1 East
US 26 Sandy Gateway Plan
Study Area Deficiencies
Legend
City Limits
Urban Growth Boundary
Parcels
Intersection Fails to Meet Mobility Standard
Protected Pedestrian Crossing
Sidewalk Infill Needed
Minimal Bike Facility
Substandard Bike Facility
Bus Stop in Right Turn Lane
Bus Stop with No Amenities
PROCTOR BLVD
PIONEER BLVD
EYCK RD
COALMAN RD
LANGENSAND RD
DUBARKO RD
VISTA LOOP
LUZON LN
26
Insufficient Corner Radius
Conflicts in Two-Way Left Turn lane
7950'
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

5. Access Management Element

Overview

The implementation of access management within the study corridors has several benefits to highway users. Because access points introduce a number of potential vehicular conflicts on a roadway and are frequently the causes of slowing or stopping vehicles, they can significantly degrade the flow of traffic and reduce the efficiency of the transportation system, in addition to increasing the potential for crashes. However, by reducing the overall number of access points and providing greater separation between them, the impacts of these conflicts can be minimized. As such, the reduction of driveways on arterials has been shown to decrease the rate of crashes experienced and can improve travel times through a given corridor.

Increased driveway separation also reduces exposure of pedestrians and bicyclists to motor vehicles, creating a more comfortable environment for non-motorized travel, and provides additional highway frontage for landscaping and other beautification treatments.

Property frontages along the US 26 west and east study corridors are anticipated to be incrementally improved over time, section by section, as abutting properties redevelop or as opportunities arise through larger scale public projects. As part of these improvements, there will be opportunities to change the way properties gain access to US 26 that will compliment the streetscape design and enhance the overall safety and efficient movement of goods and people through the corridors.

ODOT already has adopted policies and regulations in place through the 1999 Oregon Highway Plan and OAR 734-051 that will guide decision-making as these opportunities occur. However, local staff and abutting property owners are often unaware of the direction provided by these policies and regulations and the potential changes to highway access. To facilitate early understanding of the potential changes to highway access that may occur over time, a long-range vision for access within the US 26 west and east study corridors is provided that can be used as a tool to aid planning of future development and public street networks.

Access Management Objectives

To provide a basis for decision-making during the development of the Access Management Vision for the west and east study corridors, a set of access management objectives was established. These objectives were intended to reflect current practices, policies, and regulations pertaining to the management of access to US 26 and include the following:

1. Meet, or move in the direction of meeting, ODOT's adopted access management spacing standards for Statewide Highways, as documented in *OAR 734-051-0115*, Table 1. Applicable spacing standards for each US 26 access management zone within the study area are shown in Table 5.1 (zone locations are illustrated on Maps 1 through 6).

Table 5.1: Study Area Access Management Spacing Standards for US 26

Zone	Highway Segment	Functional Classification	Segment Designation	Urban/ Rural	Posted Speed	Access Spacing Standard
1	MP 22.15 – 22.74	Statewide Hwy	Expressway	Urban	45 - 55 mph	2,640 ft.
2	MP 22.74 – 23.78	Statewide Hwy	Other	Urban	40 - 45 mph	990 ft.
3	MP 23.78 – 23.87	Statewide Hwy	Other	Urban	25 mph	520 ft.
4	MP 24.61 – 24.67	Statewide Hwy	Other	Urban	25 mph	520 ft.
5	MP 24.67 – 25.34	Statewide Hwy	Other	Urban	40 mph	990 ft.
6	MP 25.34 – 26.33	Statewide Hwy	Other	Urban	55 mph	1,320 ft.

2. In attempting to meet access management spacing standards, exceptions may be allowed to take advantage of existing property boundaries and existing or planned public streets, and to accommodate environmental constraints.
3. Replace private approaches with public streets, where feasible, to provide consolidated access to multiple properties.
4. Ensure all properties are provided reasonable access to the transportation system.
5. Acknowledge the rights of access of properties abutting US 26.
6. Seek opportunities to align approaches on opposite sides of roadways where feasible to reduce turning conflicts.
7. Establish guidance for implementation of the long-range vision, including the identification of potential triggers that may lead to modifications of existing access points. Triggers identified are intended to reflect established practices for access modification implementation and are not to replace current policies or the rules set forth in OAR 734-051.
8. Recognizing that US 26 is designated as a State Freight Route and Federal Truck Route, access management actions shall not reduce the through capacity of the highway.

9. Per Policy 3B of the *1999 Oregon Highway Plan* (as amended), consideration shall be given to installation of non-traversable medians.

Access Management Vision

Considering these objectives, along with existing land use patterns, property ownership, and existing and proposed local street networks, a long-range vision for access management within the west and east US 26 study corridors was developed. By providing a long-range vision for access to the highway, public and private stakeholders in the west and east corridors will have a tool to aid planning of future development and public street networks.

To accomplish this vision, recommended actions for modifications to existing access points and establishment of new future access points have been provided in Table 5.2. In addition, Maps 1 through 6 provide an illustration of what the US 26 corridor would look like upon fulfillment of the vision and implementation of all recommended access management actions described in Table 5.2. It must be recognized that these Maps alone only show how the corridor would look upon implementation of the complete vision based on existing land use patterns and ownership, as well as existing and proposed local street networks and do not indicate when individual actions may occur.

The implementation of the access management vision and recommended actions are anticipated to happen incrementally over a long period of time, most likely as the result of land use actions on individual properties or as part of public construction projects in the corridor. In accordance with Objective 7, potential triggers for recommended actions have been provided in Table 5.2 to offer insight into the timing of implementation. The appropriate trigger for each action will vary with each property's needs in consideration of existing development operation, access rights, and reliance on future public facilities. The triggers provided are intended to reflect the common ways in which access changes are made under existing practices and are not intended to replace ODOT's policies, procedures, or regulations pertaining to access management implementation.

The triggers provided are described as: As Opportunities Arise, Change of Use, and Construction of Public or Private Roadways. Each trigger is briefly described below.

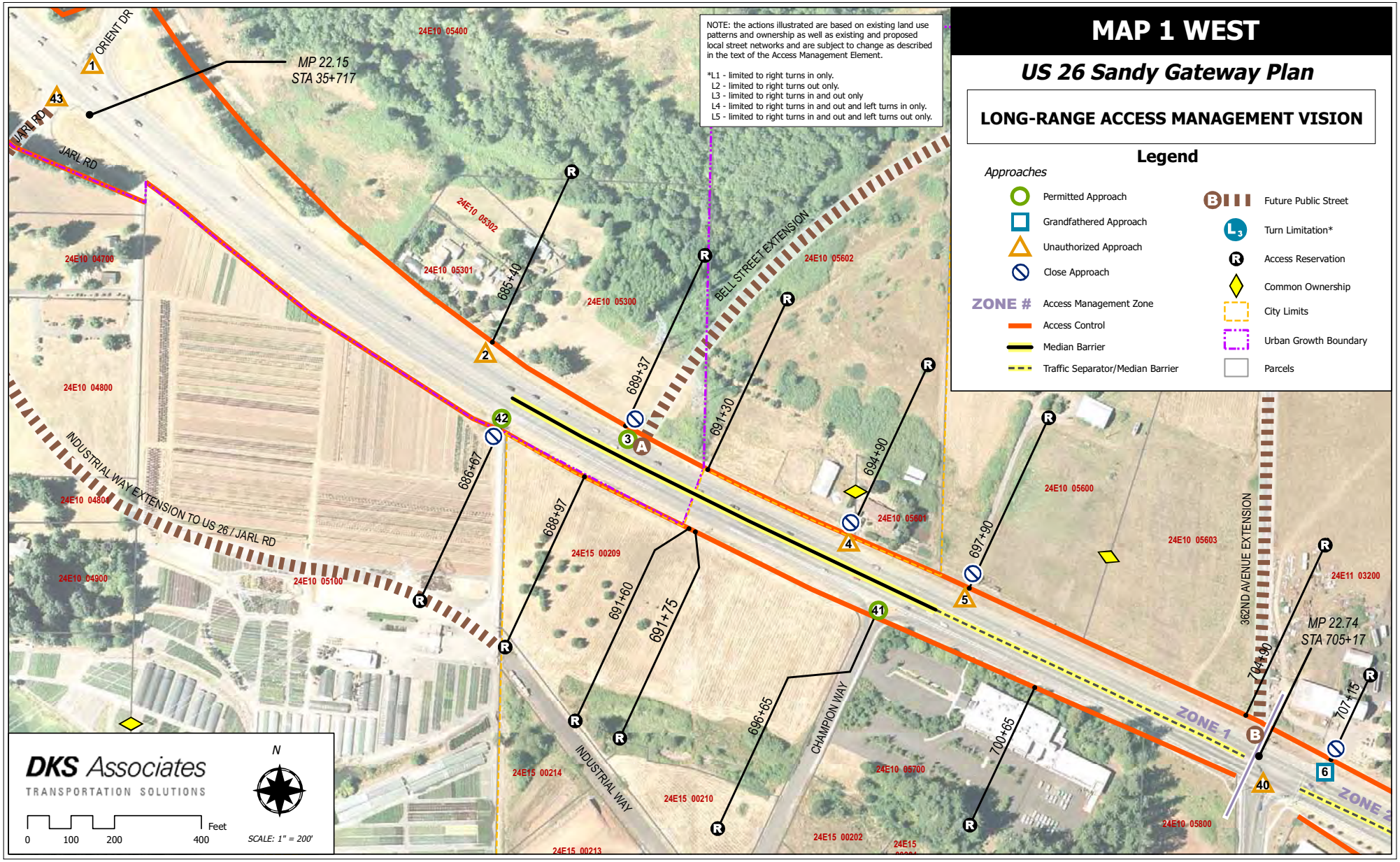
As Opportunities Arise: These actions are generally associated with approaches that are currently unauthorized, not having been permitted by ODOT or maintaining grandfathered status. However, in some cases where approaches are authorized it may be desirable to implement actions sooner where those changes are compatible with existing on-site circulation needs and determined by ODOT to be a priority for providing safe and efficient operation of the highway.

Change of Use: These actions are generally associated with approaches that have been permitted by ODOT or maintain grandfathered status. The definition and application of

the term "Change of Use" is as used in OAR 734-051-0045.

Construction of Public or Private Roadways: To maintain reasonable access to individual properties, some actions may not be feasible until alternate access is provided via future roadways. This trigger has been provided to identify those situations.

It should be recognized that the provided triggers are suggestions only and that actions regarding access modifications must be reviewed on a case-by-case basis to ensure timely modification of access in a way that adequately accommodates existing and proposed development. More guidance on implementation of changes is provided in Chapter 7.


MAP 1 WEST
US 26 Sandy Gateway Plan
LONG-RANGE ACCESS MANAGEMENT VISION
NOTE: the actions illustrated are based on existing land use patterns and ownership as well as existing and proposed local street networks and are subject to change as described in the text of the Access Management Element.
*L1 - limited to right turns in only.
L2 - limited to right turns out only.
L3 - limited to right turns in and out only
L4 - limited to right turns in and out and left turns in only.
L5 - limited to right turns in and out and left turns out only.
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
Close Approach
ZONE # Access Management Zone
Access Control
Median Barrier
Traffic Separator/Median Barrier
Future Public Street
Turn Limitation*
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
ORIENT DR
JARL RD
MP 22.15
STA 35+717
BELL STREET EXTENSION
INDUSTRIAL WAY EXTENSION TO US 26 / JARL RD
INDUSTRIAL WAY
CHAMPION WAY
362ND AVENUE EXTENSION
MP 22.74
STA 705+17
ZONE 1
ZONE 2
685+40
686+67
688+97
689+37
691+30
691+60
691+75
694+90
696+65
697+90
700+65
704+90
707+15
24E10 05400
24E10 05302
24E10 04700
24E10 05301
24E10 05300
24E10 05602
24E10 04800
24E10 04800
24E10 04900
24E10 05100
24E15 00209
24E10 05601
24E10 05600
24E10 05603
24E11 03200
24E15 00214
24E15 00210
24E10 05700
24E10 05800
24E15 00202
24E15 00213
DKS Associates
TRANSPORTATION SOLUTIONS
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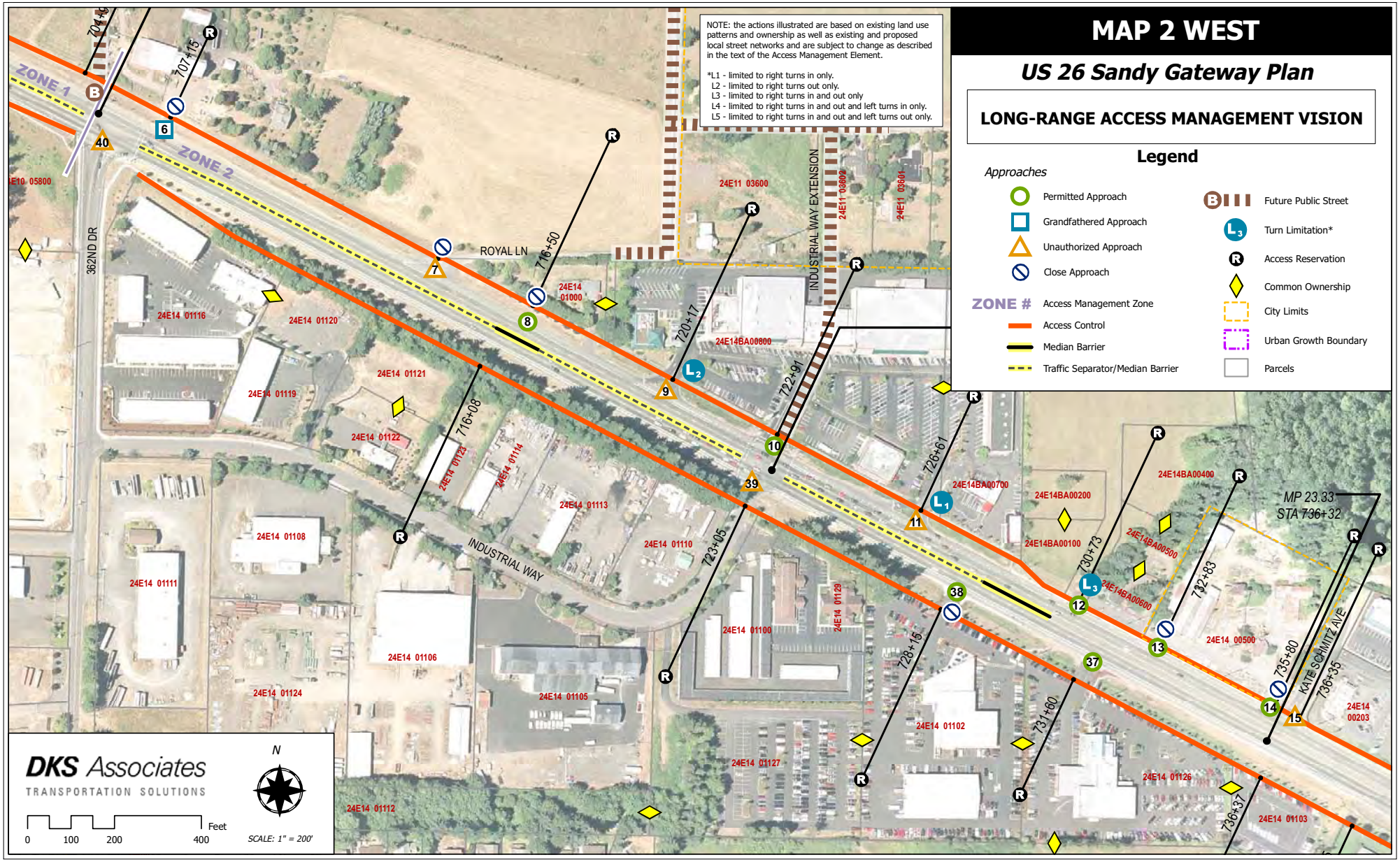
0 100 200 400 Feet
SCALE: 1" = 200'


MAP 2 WEST
US 26 Sandy Gateway Plan
LONG-RANGE ACCESS MANAGEMENT VISION
NOTE: the actions illustrated are based on existing land use patterns and ownership as well as existing and proposed local street networks and are subject to change as described in the text of the Access Management Element.
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L3 - limited to right turns in and out only
L4 - limited to right turns in and out and left turns in only.
L5 - limited to right turns in and out and left turns out only.
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
Close Approach
ZONE # Access Management Zone
Access Control
Median Barrier
Traffic Separator/Median Barrier
Future Public Street
Turn Limitation*
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
ZONE 1
ZONE 2
362ND DR
ROYAL LN
INDUSTRIAL WAY EXTENSION
INDUSTRIAL WAY
KATIE SCHMITZ AVE
MP 23.33
STA 736+32
707+15
716+50
716+08
720+17
722+91
723+05
726+61
728+15
730+73
731+60
732+83
735+80
736+35
736+37
24E14 01116
24E14 01120
24E14 01121
24E14 01119
24E14 01122
24E14 01123
24E14 01114
24E14 01113
24E14 01110
24E14 01108
24E14 01111
24E14 01106
24E14 01124
24E14 01105
24E14 01100
24E14 01129
24E14 01102
24E14 01127
24E14 01112
24E14 01126
24E14 01103
24E14 00500
24E14 00203
24E14 01000
24E11 03600
24E11 03602
24E11 03601
24E14BA00800
24E14BA00700
24E14BA00200
24E14BA00100
24E14BA00400
24E14BA00500
24E14BA00600
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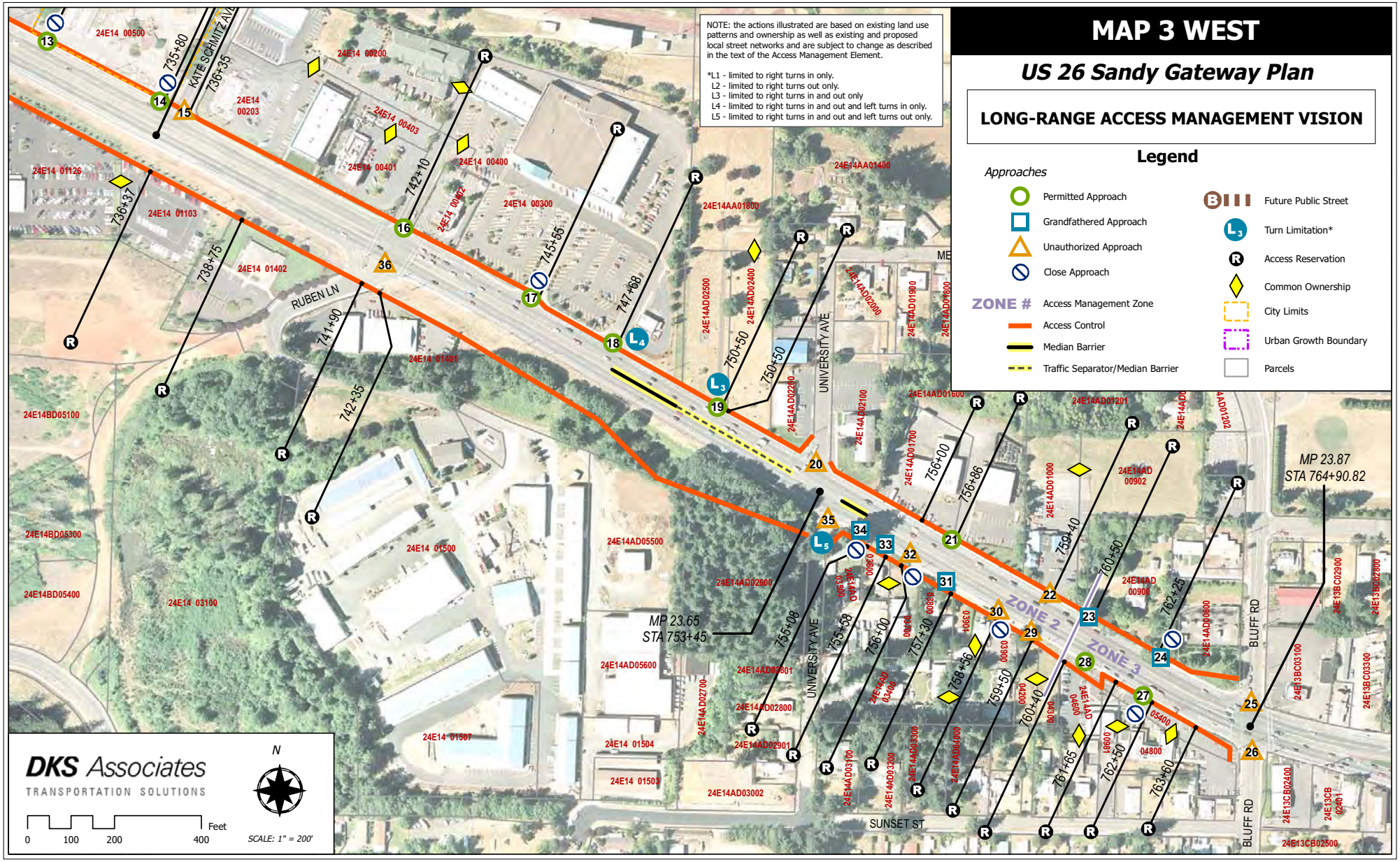
SCALE: 1" = 200'


MAP 3 WEST
US 26 Sandy Gateway Plan
LONG-RANGE ACCESS MANAGEMENT VISION
NOTE: the actions illustrated are based on existing land use patterns and ownership as well as existing and proposed local street networks and are subject to change as described in the text of the Access Management Element.
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L3 - limited to right turns in and out only
L4 - limited to right turns in and out and left turns in only.
L5 - limited to right turns in and out and left turns out only.
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
Close Approach
ZONE # Access Management Zone
Access Control
Median Barrier
Traffic Separator/Median Barrier
Future Public Street
Turn Limitation*
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
KATE SCHMITZ AVE
RUBEN LN
UNIVERSITY AVE
BLUFF RD
SUNSET ST
ZONE 2
ZONE 3
MP 23.65
STA 753+45
MP 23.87
STA 764+90.82
DKS Associates
TRANSPORTATION SOLUTIONS
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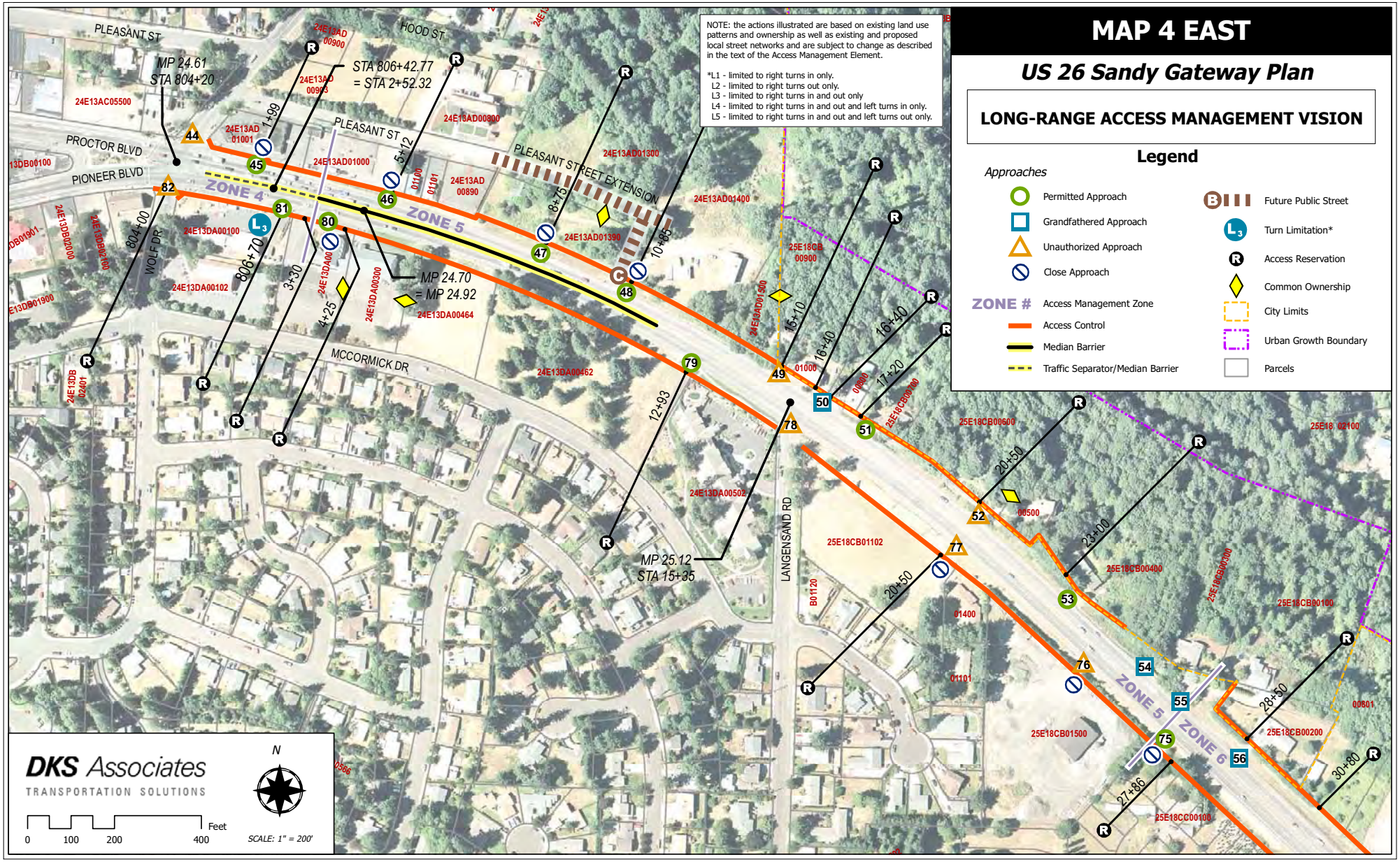
0 100 200 400 Feet
SCALE: 1" = 200'


MAP 4 EAST
US 26 Sandy Gateway Plan
LONG-RANGE ACCESS MANAGEMENT VISION
NOTE: the actions illustrated are based on existing land use patterns and ownership as well as existing and proposed local street networks and are subject to change as described in the text of the Access Management Element.
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L3 - limited to right turns in and out only
L4 - limited to right turns in and out and left turns in only.
L5 - limited to right turns in and out and left turns out only.
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
Close Approach
ZONE # Access Management Zone
Access Control
Median Barrier
Traffic Separator/Median Barrier
Future Public Street
Turn Limitation*
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
PLEASANT ST
HOOD ST
PROCTOR BLVD
PIONEER BLVD
WOLF DR
MCCORMICK DR
LANGENSAND RD
PLEASANT ST STREET EXTENSION
MP 24.61
STA 804+20
STA 806+42.77
= STA 2+52.32
MP 24.70
= MP 24.92
MP 25.12
STA 15+35
ZONE 4
ZONE 5
ZONE 6
DKS Associates
TRANSPORTATION SOLUTIONS
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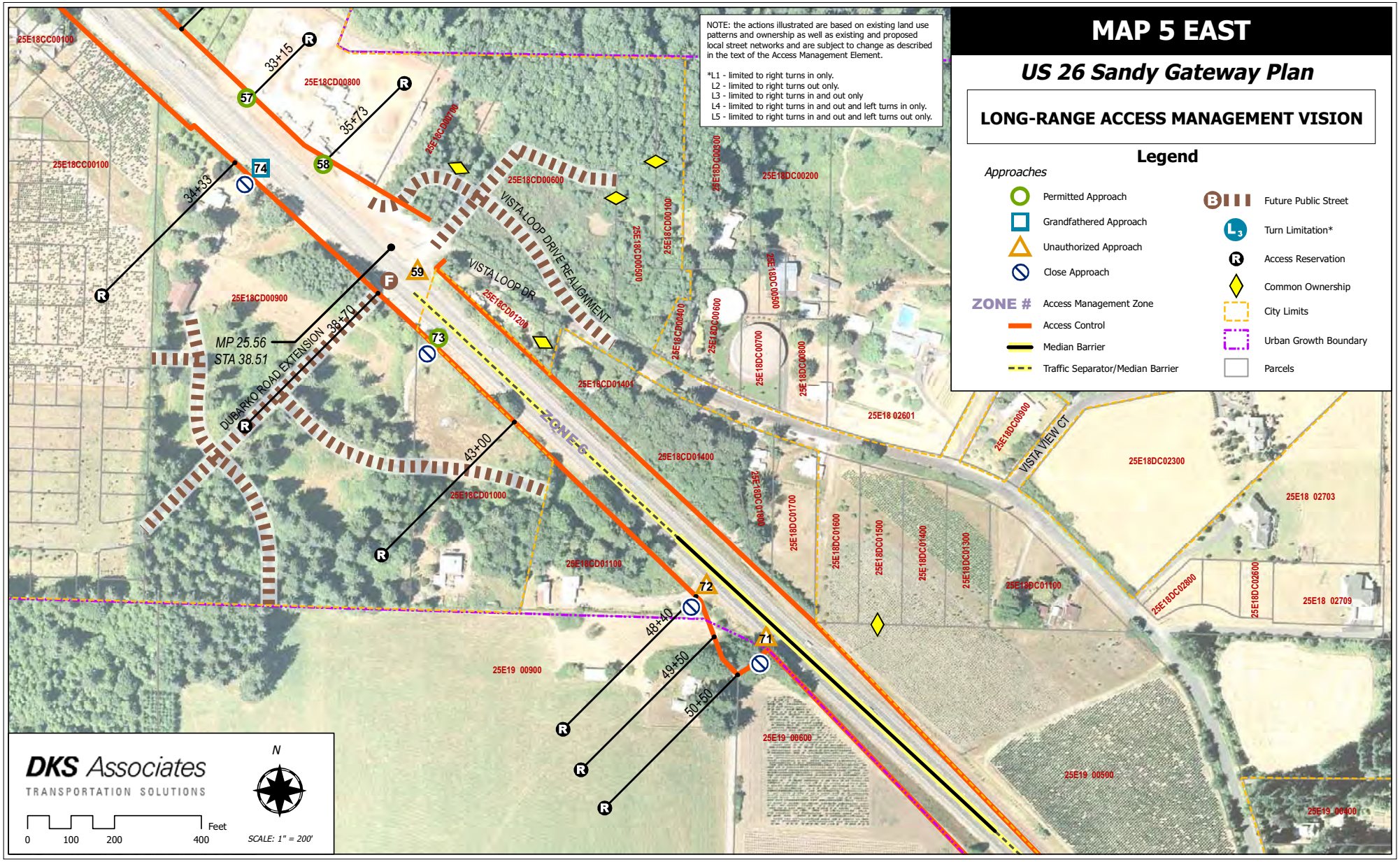
0 100 200 400 Feet
SCALE: 1" = 200'


MAP 5 EAST
US 26 Sandy Gateway Plan
LONG-RANGE ACCESS MANAGEMENT VISION
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L3 - limited to right turns in and out only
L4 - limited to right turns in and out and left turns in only.
L5 - limited to right turns in and out and left turns out only.
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
Close Approach
ZONE # Access Management Zone
Access Control
Median Barrier
Traffic Separator/Median Barrier
Future Public Street
Turn Limitation*
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
VISTA LOOP DRIVE REALIGNMENT
VISTA LOOP DR
DUBARKO ROAD EXTENSION
VISTA VIEW CT
ZONE G
MP 25.56
STA 38.51
33+15
35+73
34+33
38+70
43+00
48+40
49+50
50+50
25E18CC00100
25E18CD00800
25E18CD00600
25E18CD00700
25E18CD00100
25E18CD00500
25E18CD00900
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25E18CD01401
25E18 02601
25E18DC00900
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25E18 02703
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25E18DC01100
25E18DC02800
25E18DC02600
25E18 02709
25E19 00900
25E19 00600
25E19 00500
25E19 00400
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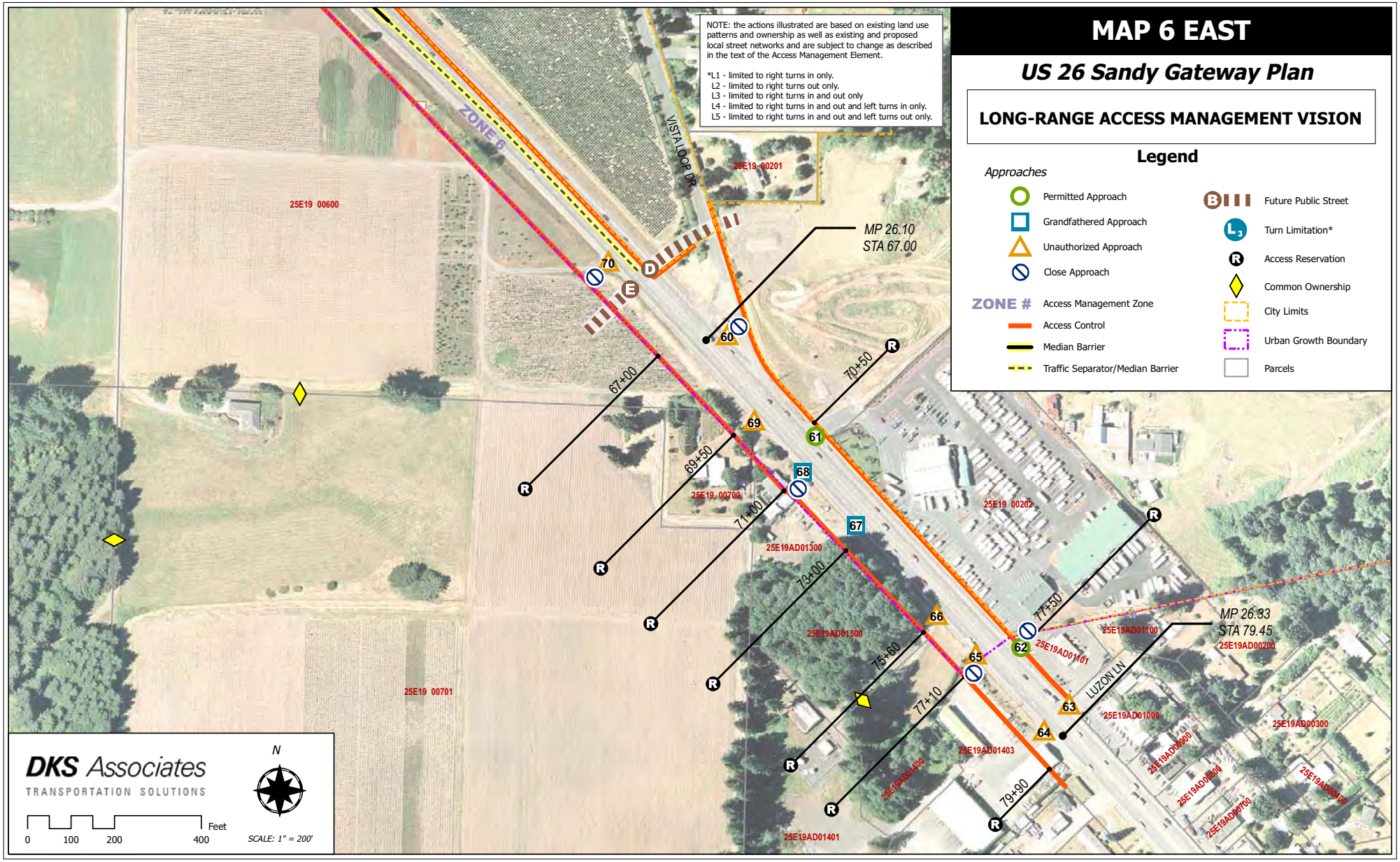
SCALE: 1" = 200'


MAP 6 EAST
US 26 Sandy Gateway Plan
LONG-RANGE ACCESS MANAGEMENT VISION
NOTE: the actions illustrated are based on existing land use patterns and ownership as well as existing and proposed local street networks and are subject to change as described in the text of the Access Management Element.
*L1 - limited to right turns in only.
L2 - limited to right turns out only.
L3 - limited to right turns in and out only
L4 - limited to right turns in and out and left turns in only.
L5 - limited to right turns in and out and left turns out only.
Legend
Approaches
Permitted Approach
Grandfathered Approach
Unauthorized Approach
Close Approach
ZONE # Access Management Zone
Access Control
Median Barrier
Traffic Separator/Median Barrier
Future Public Street
Turn Limitation*
Access Reservation
Common Ownership
City Limits
Urban Growth Boundary
Parcels
ZONE 6
VISTA LOOP DR
LUZON LN
MP 26.10
STA 67.00
MP 26.33
STA 79.45
67+00
69+50
71+00
73+00
75+60
77+10
79+90
70+50
77+50
25E19 00600
25E19 00201
25E19 00700
25E19 00202
25E19 00701
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25E19AD00300
25E19AD00900
25E19AD00800
25E19AD00700
25E19AD00400
DKS Associates
TRANSPORTATION SOLUTIONS
N
0 100 200 400 Feet
SCALE: 1" = 200'

Table 5.2: US 26 Sandy Gateway Plan Access Management Element Actions

Approach Number	Recommended Trigger for Action			Action Description
	As Opportunity Arises	Change of Use	Construction of Public or Private Roadways	
1				(Orient Dr.) No action.
2			●	Approach to remain until reasonable alternate access is made available.
3			●	Approach to be closed upon provision of reasonable alternate access, which may consist of Bell Street extension to US 26.
4			●	Close approach upon property redevelopment and provision of reasonable alternate access.
5			●	Close approach upon property redevelopment and provision of reasonable alternate access.
6			●	Close approach upon property redevelopment and provision of reasonable alternate access.
7			●	Close upon provision of alternate access by future public streets.
8			●	Close approach upon property redevelopment and provision of reasonable alternate access.
9	●			Approach to be restricted to allow right turn out movements only.
10				Approach to remain, but may be modified to a public street extended to the north.
11	●			Approach to be restricted to allow right turn in movements only.
12			●	Approach to be restricted to allow right turn in and right turn out movements only upon provision of reasonable alternate access.
13		●		Close approach at such time as a Change of Use occurs. Access to be taken from Kate Schmitz Ave.
14	●			Close approach as opportunity arises. Access to be taken from Kate Schmitz Ave.

Table 5.2: US 26 Sandy Gateway Plan Access Management Element Actions

Approach Number	Recommended Trigger for Action			Action Description
	As Opportunity Arises	Change of Use	Construction of Public or Private Roadways	
15				(Kate Schmitz Ave.) No action.
16				No action.
17		●		Close approach. Access to property is available through Approach 16.
18	●			Approach to be restricted to prohibit left turn out movements.
19	●			Approach to be restricted to allow right turn in and right turn out movements only. Alternate access is available from Meeker St./University Ave.
20				(University Ave.) No action.
21				No action.
22				No action.
23				No action.
24		●		Approach to be closed at such time as a Change of Use occurs.
25				(Bluff Rd.) No action.
26				(Bluff Rd.) No action.
27		●		Approach to be closed at such time as a Change of Use occurs. Access is available from Bluff Rd. and Approach 28.
28				No action.
29				No action.
30	●			Close approach upon property redevelopment. Access to be taken from University Ave. through property under common ownership.
31				No action.
32	●			Close approach. Access to property is available through Approach 33.

Table 5.2: US 26 Sandy Gateway Plan Access Management Element Actions

Approach Number	Recommended Trigger for Action			Action Description
	As Opportunity Arises	Change of Use	Construction of Public or Private Roadways	
33				No action.
34	●			Close approach. Access to property is available through Approach 33.
35	●			(University Ave.) Approach to be restricted to prohibit left turns in to accommodate pedestrian crossing refuge in median.
36				(Ruben Ln.) No action.
37				No action.
38		●		Close approach at such time as a Change of Use occurs.
39				(Industrial Way) No action.
40				(362nd Ave.) No action.
41				(Champion Way) No action.
42		●		Approach to be closed at such time as a Change of Use occurs. Access to be taken from Industrial Way and future Industrial Way/Jarl Rd. extension.
43				(Jarl Rd.) No action.
44				(Ten Eyck Rd.) No action.
45				Approach has been closed.
46		●		Approach to be closed at such time as a Change of Use occurs. Access is available on Pleasant St.
47		●		Approach to be closed at such time as a Change of Use occurs. Access to be taken from Pleasant St.
48			●	Approach to be closed upon provision of reasonable alternate access to future Pleasant St. extension.
49				No action.
50				No action.

Table 5.2: US 26 Sandy Gateway Plan Access Management Element Actions

Approach Number	Recommended Trigger for Action			Action Description
	As Opportunity Arises	Change of Use	Construction of Public or Private Roadways	
51				No action.
52				No action.
53				No action.
54				No action.
55				No action.
56				No action.
57				Approach to remain for emergency use only.
58				No action. Approach is within highway right of way, but not directly connected to US 26.
59				(W. Vista Loop Dr.) No action.
60	●			(E. Vista Loop Dr.) Relocate public approach approximately 200 feet to the west.
61				No action.
62		●		Approach to be closed at such time as a Change of Use occurs.
63				(Luzon Ln.) No action.
64				No action.
65	●			Close approach upon property redevelopment.
66				No action.
67				No action.
68		●		Approach to be closed at such time as a Change of Use occurs. Access to property is available through Approach 67.
69				No action.

Table 5.2: US 26 Sandy Gateway Plan Access Management Element Actions

Approach Number	Recommended Trigger for Action			Action Description
	As Opportunity Arises	Change of Use	Construction of Public or Private Roadways	
70			●	Close approach upon property redevelopment. Access to be replaced by future public street.
71			●	Close approach upon property redevelopment. Access to be replaced by future public street (see approach 70).
72			●	Close approach upon property redevelopment. Access to be taken from future public streets.
73			●	Close approach upon property redevelopment. Access to be taken from future public streets.
74			●	Close approach upon property redevelopment. Access to be taken from future public streets (Fawn St. and Dubarko Rd.).
75				Approach has been closed.
76			●	Close approach upon property redevelopment. Access to be taken from Meadow Ave.
77	●			Close approach upon property redevelopment. Access to be taken from Langensand Rd.
78				(Langensand Rd.) No action.
79				Approach to remain for emergency use only.
80	●			Close approach. Access to be taken from McCormick Dr.
81	●			Approach to be restricted to allow right turn in and right turn out movements only.
82				(Wolf Dr.) No action.
A				Construct approach for future Bell Street extension, to be limited to right-in & right-out turn movements only.
B				Construct approach for future 362nd Avenue extension.

Table 5.2: US 26 Sandy Gateway Plan Access Management Element Actions

Approach Number	Recommended Trigger for Action			Action Description
	As Opportunity Arises	Change of Use	Construction of Public or Private Roadways	
C				Construct future public approach to access future Pleasant St. extension. Approach to be limited to right-in & right-out turn movements only.
D				Construct public approach (realigned E. Vista Loop Drive).
E				Construct public approach opposite realigned E. Vista Loop Drive.
F				Construct public approach (Dubarko Road extension).

Notes: The actions recommended in this table are subject to change as described in the accompanying text of the access management element.

The Recommended Triggers are provided for guidance purposes only.

6. US 26 Streetscape Design

Overview

Following the identification of existing and future needs within the US 26 study corridors, improvement options related to transportation safety and mobility, as well as the roadway form and appearance, were considered through discussions with the City, ODOT, and the general public. As a result, a draft set of design options for the corridors were established and further refined through engineering analysis and additional meetings with public and private stakeholders.

While the design options were originally intended to include transportation system enhancements that would allow for operation within adopted mobility standards through the 20-year planning period, it was found that congestion along US 26 would be too great to be relieved solely by improvements within the corridor itself. Therefore, a maximum footprint for the US 26 corridor was assumed, with the remainder of needed improvements, including an enhanced parallel street network or possibly a relocation of US 26, deferred to the upcoming Sandy Transportation System Plan (TSP) Update.

This description of the final US 26 Streetscape Design features includes a presentation of concept drawings illustrating the future streetscape and gateways within the west and east US 26 corridors and identification of needed geometric and operational improvements along US 26 that may influence roadway widths and curb locations. Finally, the design options proposed are evaluated with the Vision and Guiding Principles developed for this plan to verify consistency with the direction provided by public and private stakeholders at the outset of the planning effort.

Recommendations to guide implementation of the plan are included in Chapter 7.

US 26 Streetscape Design

The enhancement objectives of the US 26 Streetscape Plan are to improve pedestrian mobility and safety, develop visual gateways, signify the change from rural highway to urban highway, and create a cohesive streetscape design. There may be additional streetscape features, particularly more extensive opportunities to place street trees within the highway right-of-way, supported by the City of Sandy staff and the community at-large. These revised design concepts do not preclude those if the City wishes to pursue design exceptions with ODOT. Applying for exceptions does not assume that they will be granted.

Highway Speed Zones

It is helpful to understand the existing speed zones for US 26 as it passes through the City of Sandy (see Key Map). Highway design speeds are higher than posted speeds. Design speeds are the primary criteria from the Highway Design Manual (HDM) for determining allowable features, dimensions and geometries for elements of the proposed streetscape plan. The land use context of the City is changing, and with it the roadside character changes. At some point, relevant traffic data *may* support a lowering of design speeds for some segments of US 26 inside City limits. There is no assurance that this will occur and no estimate of a timeline when it might occur. These suggested design concepts will not, by themselves, initiate a review of current design speeds.

Expressway into Town

At the City limits, posted speeds are 55 mph (70 mph design speeds). This is the first opportunity for streetscape enhancements that can progressively lead into to the downtown area. Pedestrian activity will depend on future land uses but sidewalks separated from the roadway can be added. Trees must be placed beyond a roadside clear zone of 30 feet, typically behind the sidewalks. Raised medians with low landscaping may be implemented as part of an access management or safety plan. Curbs and striped bike lanes would not be typical. Bike travel would occur along a wide roadway shoulder. With no streetscape or building frontages near the curb line, vehicles traveling at highway speeds have still a wide field of vision for drivers, which is not conducive to traffic calming strategies or pedestrian crossings.

Urban Fringe/Suburban Highway to Downtown

The urban fringe portions of US 26 (east and west corridors) have the posted speeds of 45 mph and 40 mph and finally transitions to 25 mph through the downtown couplet area. The existing land use context intensifies, contributing to a change in design character and expectations for highway users. Curbs and bike lanes appear. The required clear zones are reduced in width. Street trees can be placed closer to the curb lines, with sidewalks either in front of or behind the trees depending on available right-of-way.

In the urban fringe areas, there are also intersecting streets, building fronts, and driveways. Vehicle speed is typically slower. Landscaped medians may be implemented as part of public enhancement projects. Pedestrian crossing points need to be as safe and frequent as possible. Signalized intersections become the best opportunities to cross. Where the distances between signalized intersections are greater than 500-600 feet, it may be beneficial to use raised medians or pedestrian refuges to provide a pedestrian crossing point. Crossing treatments must be coordinated with and approved by ODOT.

Corridor Improvements

Key design elements are typical street cross-sections, gateways, pedestrian crossing

opportunities, and transit stops. Future development will provide improvements as well, with a very different highway context than exists today. The context will become more urban and pedestrian friendly.

Typical Street Cross-Sections

The typical cross-sections in Figure 6-1 begin at the City limits. This is the expressway segment of US 26. The cross-sections illustrate streetscape elements intended to create a cohesive look for the City and to provide continuous and buffered pedestrian walkways. A continuous landscaped buffer of varying widths, determined largely by highway clear zone requirements, provides the pedestrian separation from the roadway vehicles. This buffer strip also provides a continuous "green space" for visual attractiveness and can scale down the presence of the highway. The minimum right-of-way shown for each cross-section is the minimum needed to include street trees outside of the clear zone. Street trees are a key element in the palette of enhancements for US 26 within the City.

The cross-section can change as posted and design speeds change. For purposes of streetscape design concept, the changing elements are the dimension of any raised and landscaped medians and the landscaped buffer strips between the sidewalk and roadway. As clear zones (buffer strips) become smaller, street trees can be brought closer to the curb lines. The minor changes to median dimensions permitted under HDM standards would be almost imperceptible to motorists and would not significantly change the community character assuming low growing landscaping is used throughout.

The urban fringe streetscape begins with posted speeds of 45 mph (55 mph design speed). The urban streetscape probably reflects the clear change from rural to suburban highway conditions. It could be considered the beginning of a city landscape. In order to simplify implementation, it may be prudent to apply the typical urban fringe cross-section curb-to-curb across all speeds zones. Beyond the curbs, the street trees relationship to curb would change. Within the 25 mph speed (30 mph design speed), the street trees could be placed within a relatively narrow planter strip between sidewalk and curb. At that speed street trees could also be added to the landscaped medians.

Within the standards for each speed zone, the most important changes to community character and motorist perception would be an increased presence of street trees. Increased tree presence could mean more total trees within the right-of-way or moving trees closer to the travel lanes. Unless a design exception is granted by ODOT, the clear zone requirements limit the opportunity to move the trees closer. Design speeds also limit tree placement in medians and, given the likely access management strategy, median space will be fairly limited.

Design variations for the sidewalk and buffer have been proposed in order to respond to unique topographic conditions. Those conditions include limited highway shoulders and steep slopes within the right-of-way.

Pedestrian Improvements

Pedestrian improvements can and should be made. Enhancing the pedestrian environment involves three key improvements:

- Fill in the gaps in the existing sidewalk system consistent with HDM design standards.
- Upgrading current sidewalks to meet the proposed design standard.
- Pedestrian crossing improvements where feasible and safe.

Filling in the gaps in the existing sidewalk system will provide pedestrian connectivity along the corridor. The recommended sidewalk design is a six-foot minimum width with a buffer. An eight-foot walkway is preferred, but would be required where the sidewalk abuts the curb. Existing sidewalk segments that meet or exceed these standards would not be reconstructed.

Subject to ODOT approval, a pedestrian crossing improvement is recommended at the unsignalized intersection with University Avenue. It would provide a pedestrian refuge in a short raised median. Crosswalks would not be marked with striping or special paving materials. The crossing will facilitate pedestrian access to bus stops. Left turn movements south onto University Avenue and north out of University Avenue would be restricted and redirected to adjacent intersections where they could be diverted to the local street system or U-turns where feasible. No other turning movements would be restricted.

At the intersection at Champion Way, and as part of the West Gateway, an existing short median could be refurbished to be more visually attractive. As land uses changes through development, pedestrians could use the existing short median as an informal refuge. Crosswalks would not be marked with striping or special paving materials.

West Gateway

The proposed gateway location is at the crest of a hill that roughly coincides with the city limits (Figure 6-4). It is the first opportunity to see the development eventually leading to the downtown core. The location is also shared by the US Forest Information Center for Mount Hood. A gateway at this location is intended to visually reinforce the transition from rural highway to suburban conditions and speeds.

Key design elements are native landscape planting, a Cascadian style entry sign shared with the US Forest Service Center and vertical columnar basalt of varying heights to symbolically suggest “totem” elements. These basalt columns would be placed beyond the highway clear zone. No vertical element would be included in the refurbished median.

East Gateways

There are two proposed east gateway locations at Vista Loop Drive. Similar to the West Gateway, design features include native landscape planting, Cascadian natural stone as “totem” elements, and Cascadian style signage. Development could be coordinated with street frontage improvements.

The eastern location could be developed in conjunction with potential land use developments on the north side of the highway (Figure 6-8). Assuming a new four-way intersection configuration, the gateway could be a 'four corners' feature. Part of the landscape needed would be unused right-of-way. The remaining areas could be obtained in cooperation with private development.

The western location capitalizes on another four-way intersection created by development, as well as an existing STAR transit stop and open space around an ODOT maintained stormwater facility (Figure 6-7). With new intersection development, this could also be a 'four corners' feature. This intersection may become signalized in the future.

Streetscape Visual Simulations

To help further illustrate what US 26 may look like upon full implementation of the plan recommendations, representative photos of the west and east corridors were taken and graphically enhanced to simulate a future condition with complete landscaping, new curb and sidewalk, median islands, and street trees (see Photos 6.1 and 6.2). Photos of the existing condition are provided alongside the enhanced photos for comparison purposes.

Geometric Improvements & Traffic Controls

As previously noted, the following recommendations for corridor enhancements reflect the ultimate footprint of the US 26 corridors, under the assumption that maximum capacity will be provided by the existing two through lanes in each direction and without widening the corridor to add additional through lanes. It is assumed that additional off-highway improvements, such as the enhancement of the local street system, will still be needed to relieve congestion and that these improvements will be identified through the upcoming TSP Update for the City of Sandy.

While the City's TSP currently identifies a future six and seven-lane cross-section within the US 26 corridors outside of the downtown couplet, widening the corridor to three through lanes in each direction would have serious impacts given available right of way and established property frontages, and would likely require the installation of a raised median throughout the entire corridor to address potentially hazardous conditions related to the long left turn movements necessary to enter and leave abutting properties.

Under these conditions, the nature of the highway would be dramatically different, resembling a limited-access expressway through much of the City. Furthermore, because there is no plan to widen US 26 outside of the City in the Clackamas County TSP and the constrained section of highway within the downtown couplet will continue to act as a bottleneck, widening US 26 in the west and east corridors would have limited benefit to through traffic. As a result, there has been no community or City support for such a design and it will not be assumed for the development of this plan.

US 26 already maintains two through lanes in each direction. Therefore, the geometric improvements for the study corridors were focused on additional turn lanes and the provision of bus pullouts to establish the ultimate location of the curbs. When considering the physical limits for the added/improved turn lanes described below, two main components should be accounted for: the minimum storage distance (L) and the minimum deceleration distance (S). The storage distance is the area of the turn lane needed to accommodate stopped vehicles, while the deceleration distance is the area needed to transition out of the through lane and slow to a stop from the highway design speed (includes the turn lane taper). The minimum requirements for these dimensions are documented in the *Highway Design Manual* for left and right turn channelization and have also been provided in Table 6.1 for quick reference.[10]

For the following descriptions, US 26 is assumed to be aligned in the east-west direction, with local streets aligned in the north-south direction. These improvements, along with the future bus pullout locations (discussed in the following section), have also been illustrated in Figures 6.9 West and East.

[10] Some recommended storage lengths are longer than the minimum, per the findings of the operational analysis.

West Corridor

US 26/Orient Drive

- Lengthen the eastbound right turn lane to include a minimum of 175 feet of storage.
- Construct a separate northbound left turn lane with a minimum of 150 feet of storage (with extension of Industrial Way to Jarl Road/US 26).
- Construct dual southbound left turn lanes with a minimum of 225 feet of storage each.

US 26/Bell Street Extension (new intersection)

- Construct westbound right turn lane with a minimum of 50 feet of storage.

US 26/362nd Drive

- Construct dual eastbound left turn lanes with a minimum of 350 feet of storage each. The second receiving lane needed on 362nd Drive to the north should be carried at least to the Bell Street extension.
- Construct dual westbound left turn lanes with a minimum of 350 feet of storage each. The second receiving lane needed on 362nd Drive should be carried at least to the intersection with Industrial Way (the southern Industrial Way intersection).
- Construct westbound right turn lane with a minimum of 300 feet of storage.
- Construct a northbound through lane (with 362nd Drive extension to the north).
- Construct southbound approach (with 362nd Drive extension to the north) including a right turn lane with a minimum of 300 feet of storage, a through lane, and dual left turn lanes with a minimum of 300 feet of storage each.

US 26/Industrial Way

- Construct eastbound right turn lane with a minimum of 50 feet of storage.
- Construct northbound left turn lane with a minimum of 100 feet of storage.
- Lengthen the westbound right turn lane to include a minimum of 150 feet of storage.

US 26/Ruben Lane

- Lengthen the eastbound right turn lane to include a minimum of 250 feet of storage.
- Lengthen the westbound right turn lane to include a minimum of 150 feet of storage.

US 26/Bluff Road

- Construct eastbound right turn lane with a minimum of 150 feet of storage (current design is substandard).
- Construct westbound right turn lane with a minimum of 100 feet of storage (current design is substandard).

- Construct northbound left turn lane. Available right of way may provide for up to 75 feet of storage.
- Construct southbound right turn lane. The proximity of the PGE substation may limit the storage to 50 feet. However, if right of way becomes available, a minimum storage length of 150 feet should be provided.
- Construct southbound left turn lane. Planned improvements for Bluff Road to the north include a three-lane cross-section, which would accommodate the needed left turn lane.

East Corridor

US 26/Ten Eyck Road

- Construct southbound left turn lane with minimum storage of 150 feet. However, because right of way is constrained, widening of Ten Eyck Road may only be able to reach only as far as the west leg of Pleasant Avenue.
- Construct northbound left turn lane with minimum storage of 150 feet. Again, because right of way is limited along Wolf Drive, widening may only be able to reach as far as McCormick Drive.

US 26/Langensand Road

- Construct eastbound right turn lane with a minimum of 50 feet of storage (current design is substandard).

US 26/West Vista Loop Drive

- The Dubarko Road extension and realignment of West Vista Loop are anticipated to include intersection improvements that will modify the side street approaches to both include separate right turn lanes and shared through/left turn lanes.
- In addition to improvements associated with the Dubarko Road extension, construct an eastbound right turn lane on US 26 with a minimum of 100 feet of storage.
- A traffic signal is anticipated to be installed at this intersection when it is warranted in the future.

US 26/East Vista Loop Drive

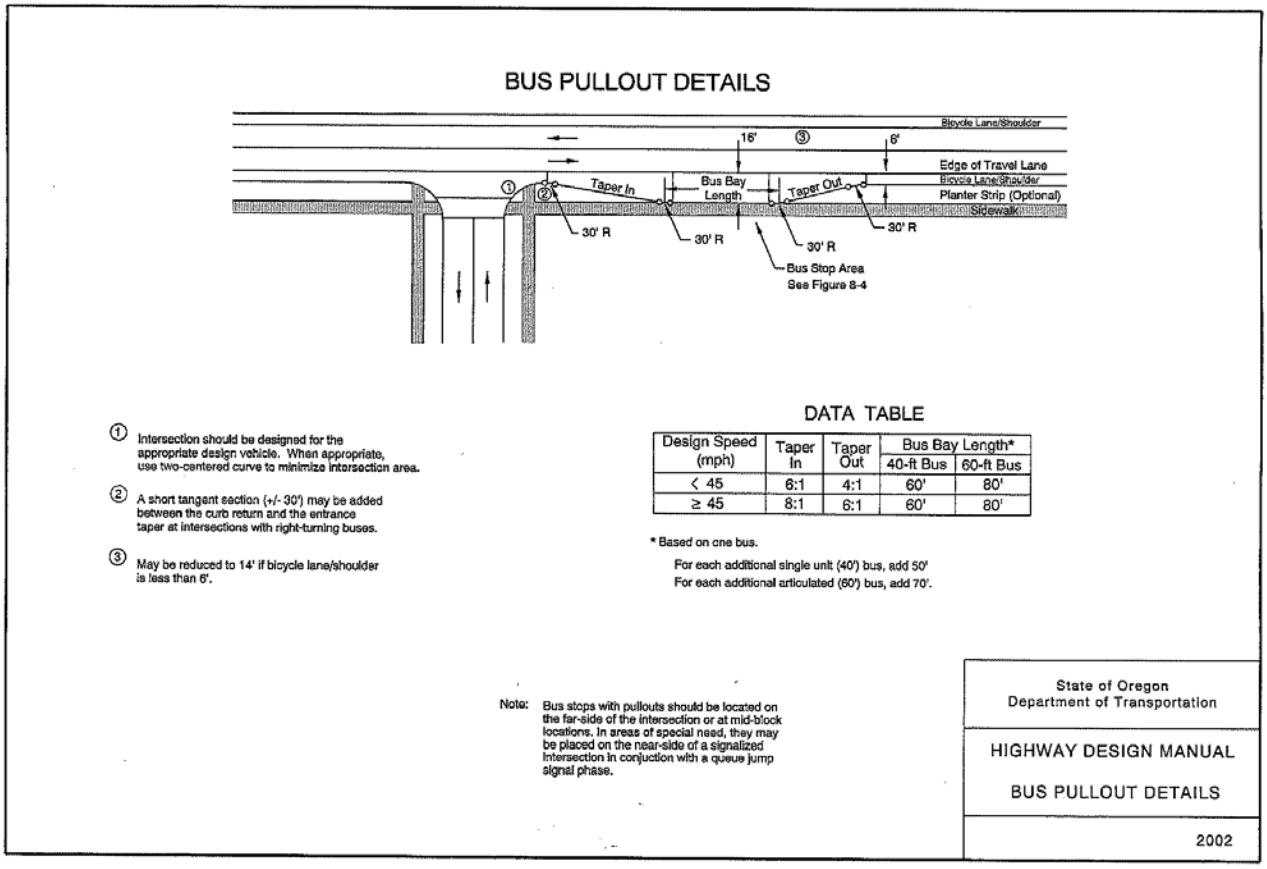
- Construct westbound right turn lane with a minimum of 50 feet of storage.

Table 6.1: Minimum Dimensions of Turn Lanes within the US 26 Study Corridors

Intersection	Movement	Minimum Storage Length (L)	Minimum Deceleration Length (S)
Orient Drive	Eastbound Right	175'	555'
	Westbound Left	150'	555'
Bell Street Extension	Westbound Right	50'	555'
362nd Drive	Eastbound Lefts (2)	350'	355'
	Westbound Lefts (2)	350'	355'
	Westbound Right	300'	355'
Industrial Way	Eastbound Right	50'	355'
	Eastbound Left	175'	355'
	Westbound Right	150'	355'
Ruben Lane	Eastbound Right	250'	235'
	Eastbound Left	275'	235'
	Westbound Right	150'	235'
	Westbound Left	150'	235'
University Avenue	Eastbound Left	100'	235'
Bluff Road	Eastbound Right	150'	150'
	Eastbound Left	275'	150'
Ten Eyck Road	Westbound Left	100'	150'
Pleasant Avenue Extension	Westbound Right	50'	235'
Langensand Road	Eastbound Right	50'	235'
	Westbound Left	100'	235'
West Vista Loop Drive	Eastbound Right	100'	555'
	Eastbound Left	150'	555'
	Westbound Left	250'	555'
East Vista Loop Drive	Eastbound Left	200'	555'
	Westbound Right	50'	555'

Provisions for Transit

As the Streetscape Plan is implemented, there will no longer be enough width between the travel lanes and curb to safely stop buses. Therefore, the construction of bus pullouts will be essential. Some existing bus stops will be relocated in response to changing land use or better pedestrian crossing opportunities. The construction of bus pullouts noted below must be done according to ODOT standard design, as shown in the following illustration.



West Corridor

US 26/Champion Way

- Construct bus pullout and bus stop in the westbound direction, opposite Champion Way.

US 26/362nd Drive

- Moving the eastbound bus stop to the far side of the intersection and constructing a bus pullout is preferred to the current location, which is approximately 500 feet west of the intersection with 362nd Drive. However, there is currently a pullout for ODOT maintenance vehicles at that location to service the signal cabinet nearby. Therefore, a new pullout will be constructed with additional length to provide space at the west end near the signal cabinet for a maintenance vehicle and adequate area to the east for use by buses.
- When 362nd Drive is extended to the north, move the westbound bus stop to the far side of the intersection (currently established on near side) and construct a bus pullout.
- Shelters should be constructed at both the eastbound and westbound stops.

US 26/Industrial Way

- Move the eastbound bus stop to the far side of the intersection and construct a pullout.
- The westbound stop would remain in its current location.

US 26/Ruben Lane

- Move the eastbound bus stop to the far side of the intersection and construct a pullout and a shelter.
- The westbound stop is currently on the near side of the intersection. Refinements made through the Transit Master Plan may include moving this stop to the far side of the intersection. A bus pullout should be constructed at the final location selected.
- Constructing a shelter at the westbound stop in front of the Safeway is a high priority.

US 26/University Avenue

- Construct a pullout for the eastbound bus stop, which would remain on the far side of the intersection.
- Construct a pullout for the westbound bus stop, which would remain on the far side of the intersection.

US 26/Bluff Road

- The eastbound stop location and design will remain at its current location.
- Construct a shelter for the eastbound stop, or minimally install a bench.
- The westbound stop will be constructed as part of the Walgreens development.

East Corridor

US 26/Ten Eyck Road

- Due to area constraints, all stops are to remain in current locations.

US 26/Langensand Road

- Eastbound stop (there is no westbound stop) to remain in current location.

US 26/West Vista Loop Road

- An eastbound stop is not needed.
- The westbound stop on West Vista Loop Drive does not need improvement.

US 26/East Vista Loop Road

- Stops in this area will occur on Vista Loop Road. No stops on US 26 are needed.

Adherence to Vision and Guiding Principles

To ensure the recommended streetscape design and complimenting improvements are consistent with the direction provided by ODOT, the City, and the general public, the plan recommendations have been reviewed with consideration to the guiding principles formed at the outset of the project.

Highway Mobility

- US 26 must provide for safe and efficient high-speed, continuous operation, ensuring timely movement of freight.

  The geometric improvements and access management actions recommended will support efficient travel through the corridor and would enhance safety by reducing potential conflict points. The highway designs proposed are consistent with ODOT standard designs and should not impede freight movement.

- Unless safety or access considerations are required, the vehicle-carrying capacity of US 26 may not permanently be reduced.

  The proposed enhancements will not reduce the vehicle-carrying capacity of US 26.

- Sufficient capacity on US 26 must be provided to allow for ODOT mobility standards to be met under future traffic demands.

  While the proposed improvements will not enable mobility standards to be met along US 26, they are supportive of efforts to enhance corridor capacity. Further improvements must be developed through the Transportation System Plan to address heavy congestion forecast for this corridor.

- Proposed improvements should address local, as well as regional and statewide transportation needs.

  Accommodations are made for improved transit operation in the corridor, as well as enhancements to biking and walking facilities. The plan also supports the development of additional public streets to better serve lands surrounding the US 26 corridor.

- Options for improving local circulation should be explored, particularly to reduce local trip demand on US 26.

  Future public street extensions parallel to and intersecting with US 26 are accommodated in the plan. Further development of supporting public street networks will be addressed through the Transportation System Plan.

- A pattern of connected local streets, and continuous sidewalks and bicycle routes should be provided.

  Continuous facilities will be provided for walking and biking along the US 26 corridors. Through the Transportation System Plan update process, City street design standards should ensure appropriate bicycle and pedestrian accommodations are provided on new connecting public streets.

- Traffic signals on US 26 should be located where they will provide the highest benefit for mobility/traffic operations, and improve safety and convenience for pedestrians, bicyclists and transit riders. The location of traffic signals should be consistent with the street network in the City of Sandy Comprehensive Plan Map and Transportation System Plan and must have the approval of ODOT.

  The only proposed new signal is at the intersection with US 26 at West Vista Loop/Future Dubarko Road extension. While the timing of construction is uncertain, it appears that this signal would be warranted within the 20-year planning horizon, following the completion of the Dubarko Road extension and surrounding development. This signal would be located approximately 3,800 feet from the nearest existing signal (Ten Eyck Rd.), which would provide adequate separation for efficient signal timing.

Highway Safety and Access

- The plan should reduce conflicts in the center turn lane on US 26.

  The recommended actions in the access management element will reduce the number of overall access points and will construct non-traversable median in some locations.

- Non-traversable medians should be installed in the center turn lane on US 26, with full and directional openings at locations that meet access spacing standards.

  The construction of non-traversable medians in some locations has been included in the access management recommendations. Breaks in the median were provided to limit extensive out-of-direction travel, as the distance between public street intersections is fairly long in some areas.

- Property access for parcels on US 26 should be focused on local streets where available, and direct highway access limited.

  Recommended actions in the access management element include the removal of direct highway access where alternate access is available.

- ODOT should purchase access rights to US 26 as opportunities arise.

  Access rights have been purchased through the study corridors through previous efforts. Reservations of access would likely be purchased on a case-by-case basis over time.

- Shared driveways and inter-parcel circulation for adjoining parcels with compatible land uses should be facilitated.

  The City Development Code currently provides for the provision of inter-parcel circulation and shared driveways between adjoining properties.

Pedestrians, Bicycles, and Transit

- Create pedestrian and bicycle-friendly streetscapes that reflect the transition from rural to urban conditions.

  Wider bike shoulders (eight feet) transition to slightly narrower bike lanes (six feet) as design speeds drop. Also, the buffer between pedestrians and motor vehicles will decrease along with highway speeds to bring pedestrians closer to the field of view of motorists.

- Provide for safe and comfortable transit access along the US 26 corridor.

  Enhanced bike and pedestrian facilities will improve access to transit along the corridor. Provisions for bus pullouts will improve the safety of transit operation by removing stopped buses from the flow of traffic.

- Provide bikeway and walkway systems that recognize their users as "design vehicles" of the transportation system.

  Convenient and comfortable bicycle and pedestrian facilities have been included to provide minimal out-of-direction travel.

- Reduce the barrier effect of US 26 by facilitating bicycle and pedestrian crossing.

  Additional crossings will be facilitated at the intersections on US 26 at University Avenue, where a pedestrian refuge island will be installed, and at West Vista Loop Drive, where a future traffic signal with protected crossings will be constructed.

Highway Design and Character

- Highway design should reflect adjacent land uses with transitions from rural to highway commercial to downtown commercial settings.

  The location of gateways and beginning of urban streetscape elements are visual markers for the transition from rural to urban. Urban streetscape features such as continuous and uniform sidewalks, bike lanes, and a roadway "green space" of medians and clear zones with low plantings and streets behind sidewalks create an attractive front door for planned and existing land uses.

- As the highway nears the community it should become an approach road, transporting motorist into the city center and simultaneously providing access to connecting streets.

  By carefully adjusting landscape plantings and street tree locations as travel speeds diminish the motorist is led into an increasing urban environment that culminates in downtown. Design of transit stop improvements, additional pedestrian crossing opportunities and improved travel safety through access management also support these objectives.

- Gateways should be designed to identify the entry from rural to suburban and from urban to central business district areas.

  Gateway locations were selected to correspond to significant changes in the built environment surrounding the highway and visual connections to key urban aspects of the highway environment. The forms and materials have a large enough scale to attract the attention of motorists but are simple enough to be visually taken in at a glance.

- Gateway and streetscape elements should preserve the historic character of "Old Sandy" and emphasize unique scenic resources.

  Gateway elements use basalt stone, indigenous to the mountain and the region, Cascadian style signage and native plantings. Similar planting palettes can be extended throughout the roadway green spaces of landscaped clear zones between sidewalk and curb and in any landscaped medians implemented for safety or access management purposes.

- Streetscape treatments should be coordinated with those proposed in the Sandy Downtown Plan.

  Enhanced landscape planting is an integral part of Sandy Gateway Plan and the Sandy Style design standards for the City (Chapter 17.90). Both efforts are compatible in their recommendations and can be coordinated as future development occurs. Code standards for Commercial and Industrial Uses (17.90.120) are the most applicable to the project area and future streetscape enhancements. The required landscape buffer can include the highway right-of-way and frontage improvements subject to ODOT approval. The mixture of plant types listed in 17.90.120-F and guidelines for maintaining business visibility are consistent with this plan. As previously noted, all concepts illustrated in the Sandy Gateway Plan meet current Highway Design Manual (HDM) standards and other ODOT engineering bulletins. The potential for requesting design exceptions in the future has been noted.

- The US 26 highway plan should reflect coordinated efforts between Sandy, Clackamas County and ODOT and provide a unified "roadway architecture" concept for the City of Sandy.

  Review and input about design character and opportunities for joint endeavors between the City and ODOT have been a significant part of the design dialogue for the project. Gateways at the east City limits (Vista Loop Drive) may be the first opportunities for an ODOT and City partnership.

Plan Implementation

- Provide tools to implement the highway design and access management recommendations as properties develop and/or roadway projects are designed.

  An assessment of the City Comprehensive Plan, TSP, and Development Code has been provided with recommendations for needed amendments.

- Ensure that implementation is consistent with applicable adopted policies and regulations of the City of Sandy and ODOT.

  City and ODOT representatives have participated in the plan development process regularly through participation on the Project Management Team and Technical Advisory Committee. In addition, applicable ODOT and City regulations and policies were reviewed at the outset of the project.

US 26 SANDY GATEWAY PLAN

STREETSCAPE IMPROVEMENT PLAN KEY MAP

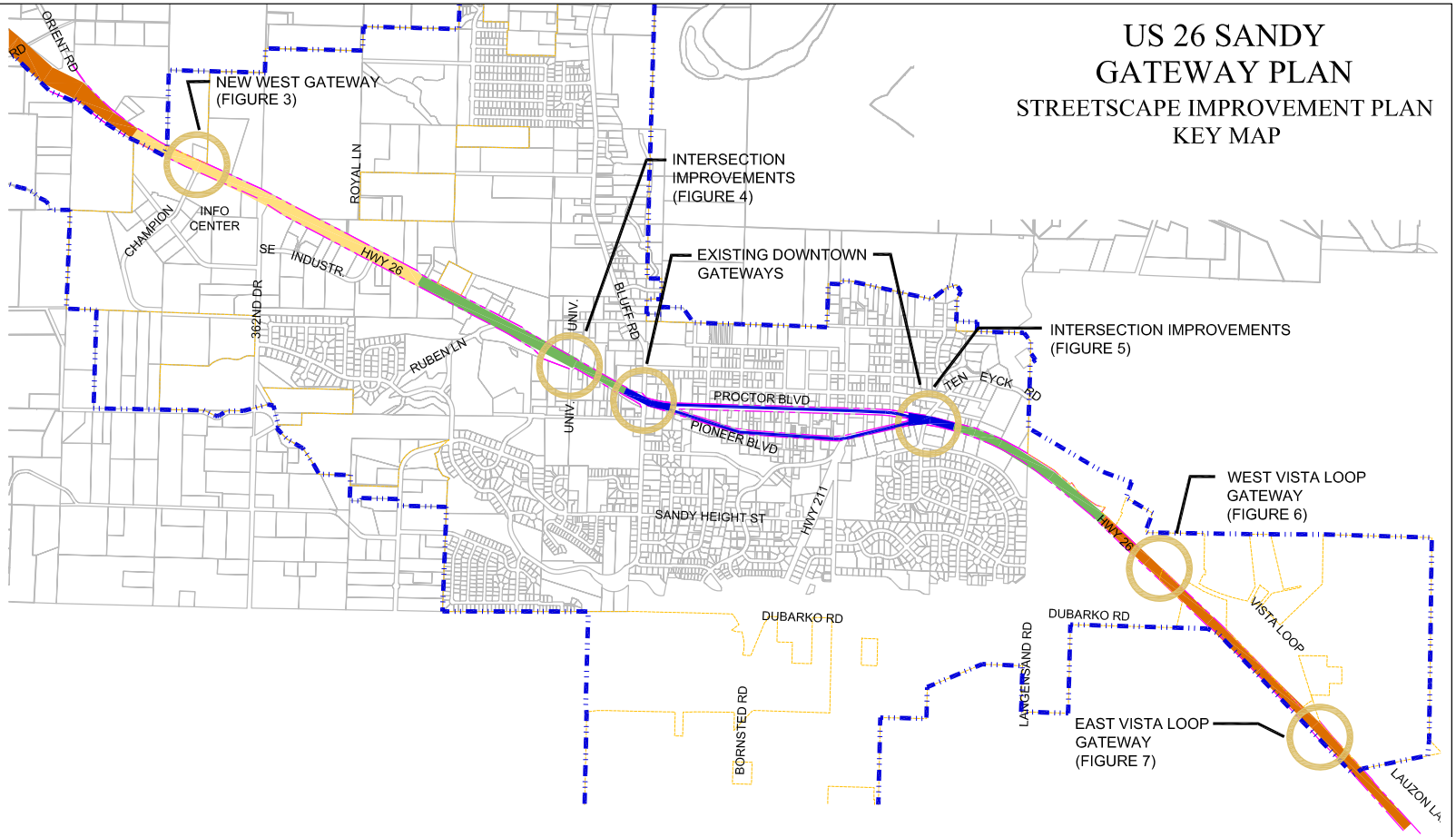
EXISTING CONDITIONS

Typical Uncurbed Sidewalk

Sidewalk Below Grade

Discontinuous and Below Grade

No Sidewalk



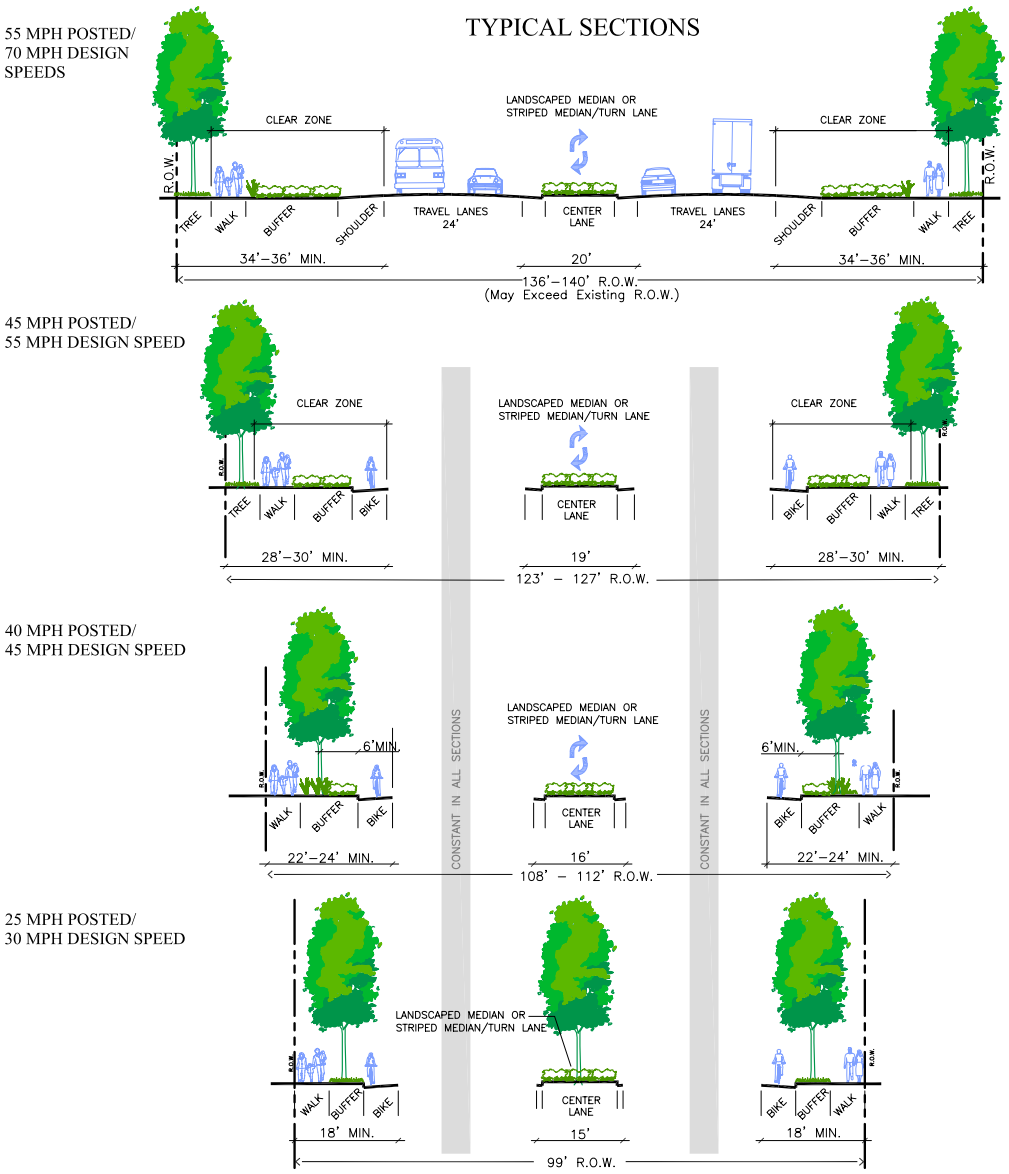
LEGEND

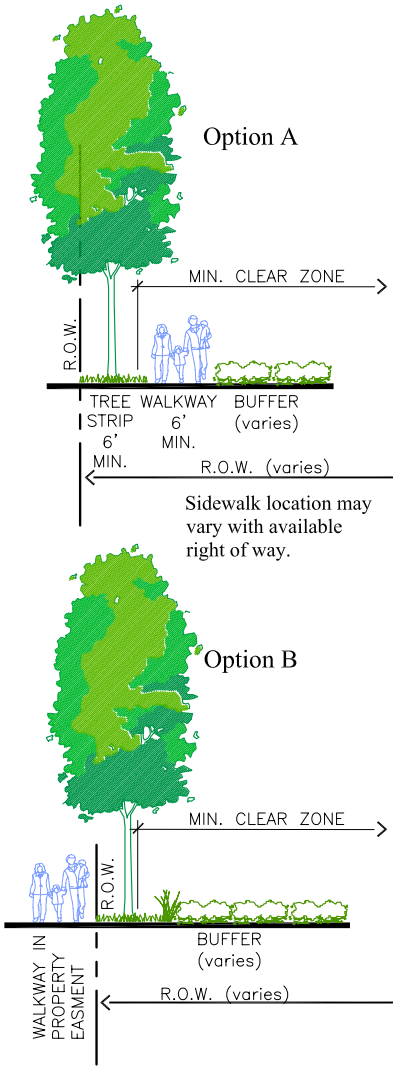
- 25 MPH POSTED SPEED
- 40 MPH POSTED SPEED
- 45 MPH POSTED SPEED
- 55 MPH POSTED SPEED
- UGB
- GATEWAYS AND INTERSECTION IMPROVEMENTS

April, 2008

US 26 SANDY GATEWAY PLAN

PROTOTYPICAL STREETSCAPE





Design Speed/Posted Speed Table	
Posted Speed	*Design Speed*
55 mph	70 mph
45 mph	55 mph
40 mph	45 mph
25 mph	30 mph

THE STREETSCAPE CONCEPT

These design elements are conceptual and consistent with standards of ODOT's Highway Design Manual. Right-of-way widths are minimums needed to include street trees beyond the required Clear Zones as part of street frontage improvements.

HIGHWAY MEDIANS

Most of Highway 26 within the City limits will continue to have a striped center lane median. This median is not raised or landscaped. It will include designated turning lanes.

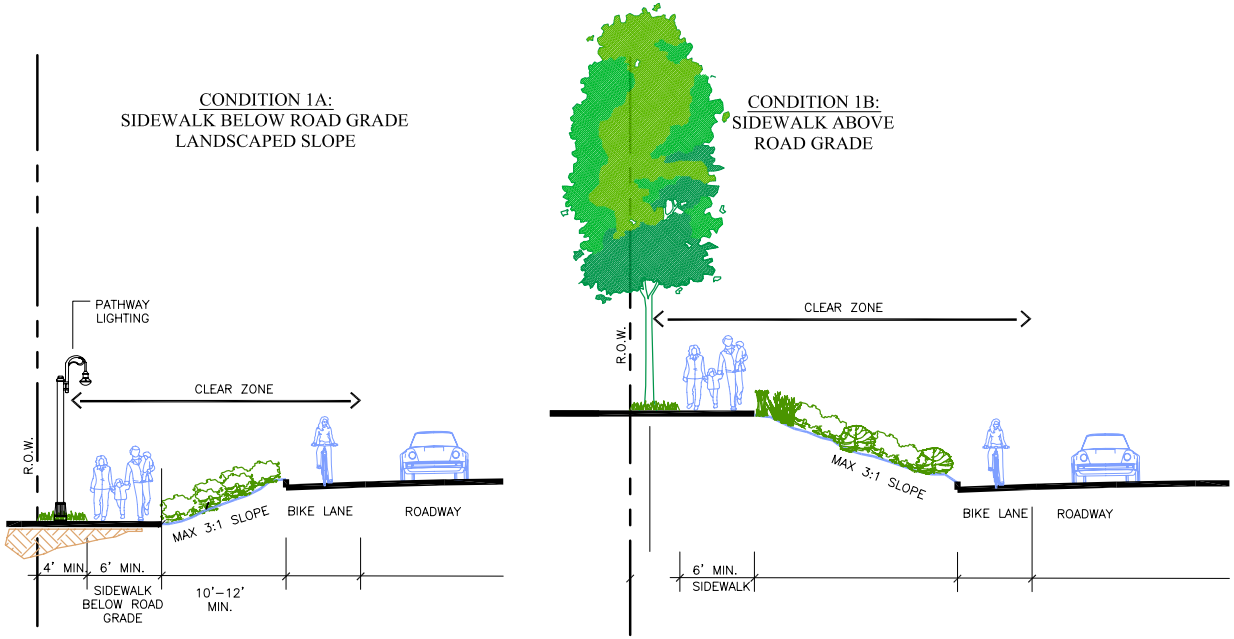
At selected locations, a raised and landscaped median may be constructed in the future. Locations for future medians will subject to developing an actual access managment plan and ODOT approval. Landscaping for the median will conform to ODOT standards or expressly granted design exceptions.

FIGURE 6-1

April, 2008

US 26 SANDY GATEWAY PLAN

STREETSCAPE SPECIAL CONDITIONS



DESIGN CONSIDERATIONS

In both East and West Corridors, there are topographic conditions that do not support a sidewalk at-grade with the roadway. Walkways below or above highway grade should be provided with landscaped slopes from highway edge to walkway. The design concept is intended to maintain a continuous and safe pedestrian walkway for new development, as well as providing access to the downtown core.

Sidewalks above or below grade should be well-lighted for nigthtime use, especially in locations where pedestrians will not be easily seen from the highway or surrounding uses. Provide special pedestrian lighting if necessary (15-18 foot height with cutoff fixtures to reduce glare and light pollution). Above-grade sidewalks should be fully illuminated by highway street lighting. Use supplemental pedestrian lighting as needed.

FIGURE 6-2

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US 26 SANDY GATEWAY PLAN

STREETSCAPE SPECIAL CONDITIONS

DESIGN CONSIDERATIONS

In parts of the East and West Corridors a steep slope abuts the highway. Special design solutions will be required to provide continuous and safe pedestrian walkways . The design should maintain as much cohesive streetscape as possible while responding to unique topographic and/or land use conditions. For the design concepts illustrated below, the curb-tight sidewalk is the least desireable option. Buffered sidewalks should be constructed wherever possible. Sidewalks should also be well-lighted for night-time use. If standard highway lighting is absent or inadequate given the location of the walkway, provide addtional pedestrian-scale pathway lighting (15-18 foot height with cutoff fixtures to reduce glare and light pollution).

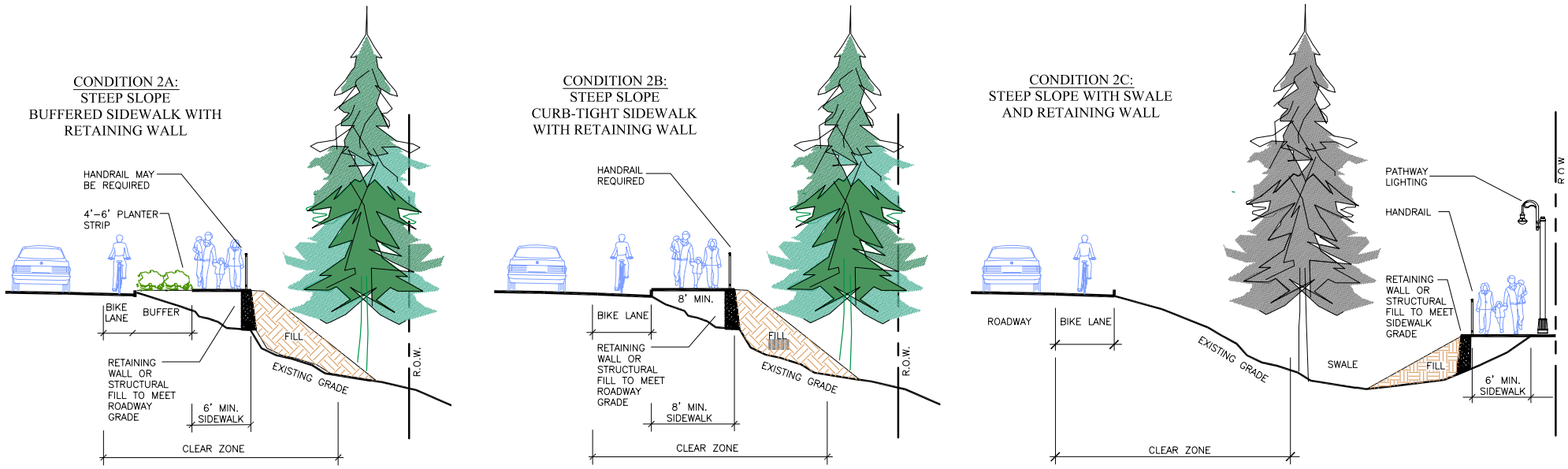


FIGURE 6-3

April, 2008

US 26 SANDY GATEWAY PLAN

WEST GATEWAY

DESIGN CONSIDERATIONS

Well developed and designed gateways will visually reinforce the change from rural highway to urban streetscape, and begin reduced speed approaching the downtown core. They will also provide an enhanced pedestrian environment. The intent of the design concept is to use Cascadian style materials of basalt stone columns, native plantings and entry signage of irregular and fitted stone.

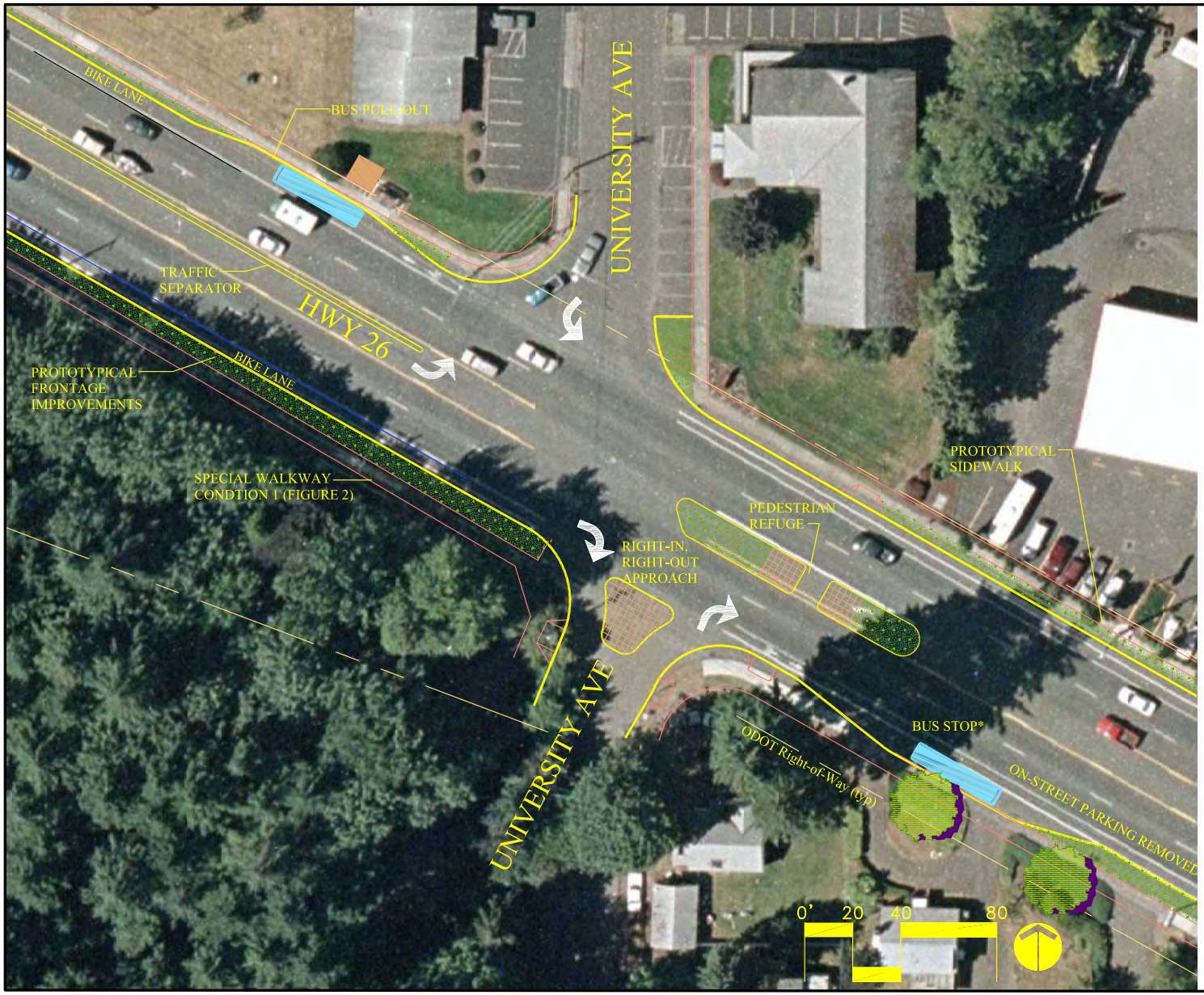
Placement of all gateway signage and basalt columns is subject to ODOT design criteria and required highway clear zones.

CASCADIAN STYLE SIGN GATEWAY FEATURE

COLUMNAR BASALT GATEWAY FEATURE

FIGURE 6-4

April, 2008



US 26 SANDY GATEWAY PLAN

US 26 AT UNIVERSITY AVE

DESIGN CONSIDERATIONS

The proposed streetscape changes are intended to improve pedestrian crossing and access to transit at an unsignalized intersection. Left turn movements at the sourthern leg of University Avenue restricted and redirected to adjacent intersections, local streets, or U-turns where feasible. Left turn movements at the northern leg of University Avenue would not be restricted.

Unmarked Pedestrian Crossing Refuge

KEY

Concrete pavers

*Bus Stop design in conformance with ODOT HDM Figure 12-1

FIGURE 6-5

April, 2008

US 26 SANDY GATEWAY PLAN

US 26 AT TEN EYCK

DESIGN CONSIDERATIONS

The existing conditions contribute to a poor pedestrian environment, unsafe walking conditions and difficult street crossings for pedestrians. Streetscape and pedestrian safety improvements should be implemented as redevelopment of existing property occurs or as part of a potential streetscape improvements grant for the US 26 East Corridor.

Key improvment elements would be:

- Continuous walkways to the east, including utilizing the could be Special Conditions design solutions (Figure 6-3).
- ADA compliant curb ramps and crosswalks at Ten Eyck Road.
- Buffered sidewalks and landscaping consistent with the recommended street frontage improvments (Figure 1).

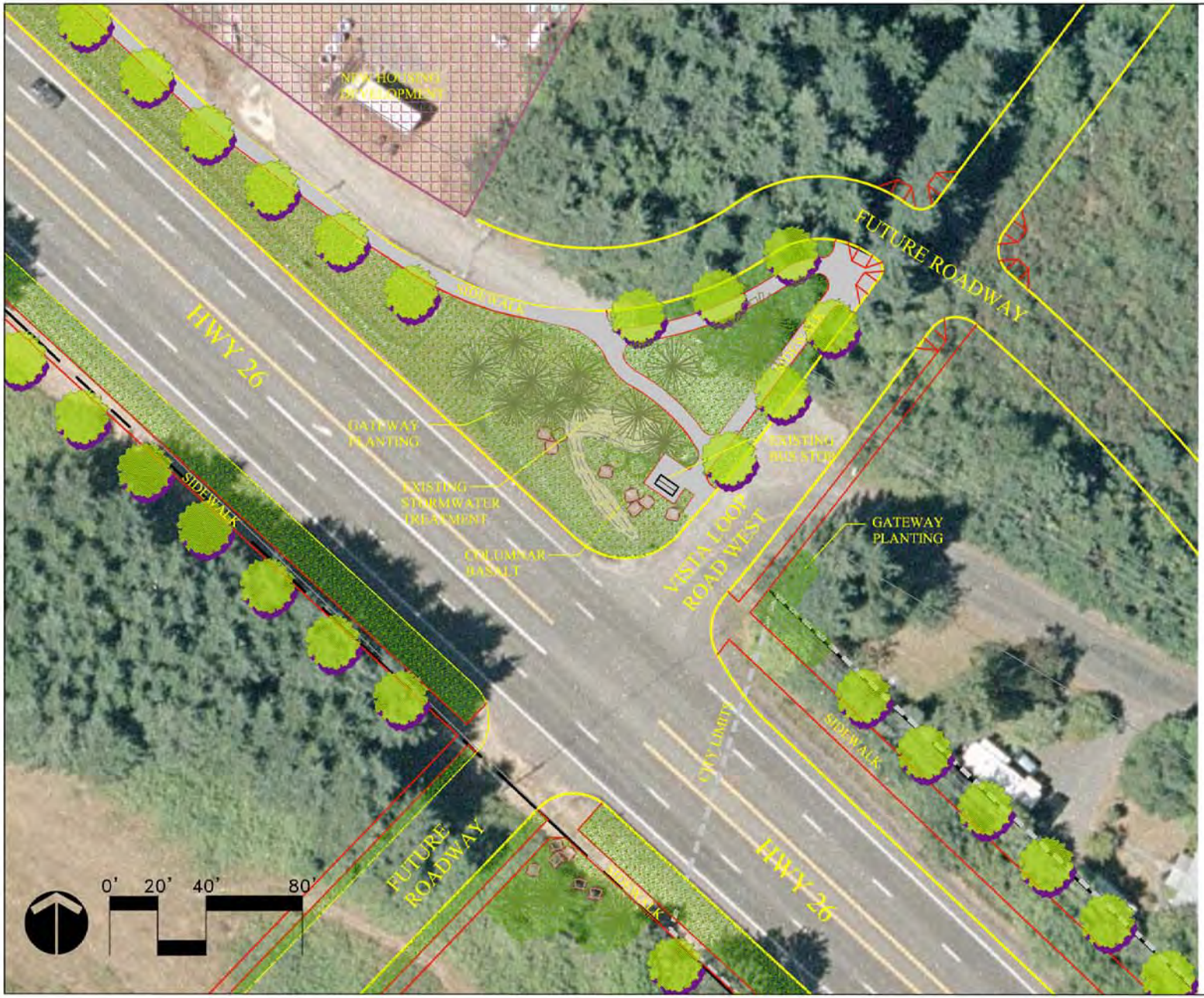
Lack of sidewalks or pedestrian buffering

Difficult intersection crossing

Continuous and buffered sidewalk

FIGURE 6-6

April, 2008



US 26 SANDY GATEWAY PLAN

WEST VISTA LOOP GATEWAY

DESIGN CONSIDERATIONS

The intent is to create two closely spaced Eastern Corridor gateways. The location at West Vista Loop is the second gateway as traffic approaches the downtown core. The location capitalizes on an existing STAR transit stop with shelter and open space around a maintained ODOT stormwater facility. Due to topographic conditions, the existing path in the NW quadrant serves in lieu of a sidewalk along the highway and will connect to a new sidewalk to the west. The design concept uses Cascadian style materials of basalt stone columns, native plantings and entry signage of irregular and fitted stone.

Placement of all gateway signage and basalt columns is subject to ODOT design criteria and required highway clear zones.

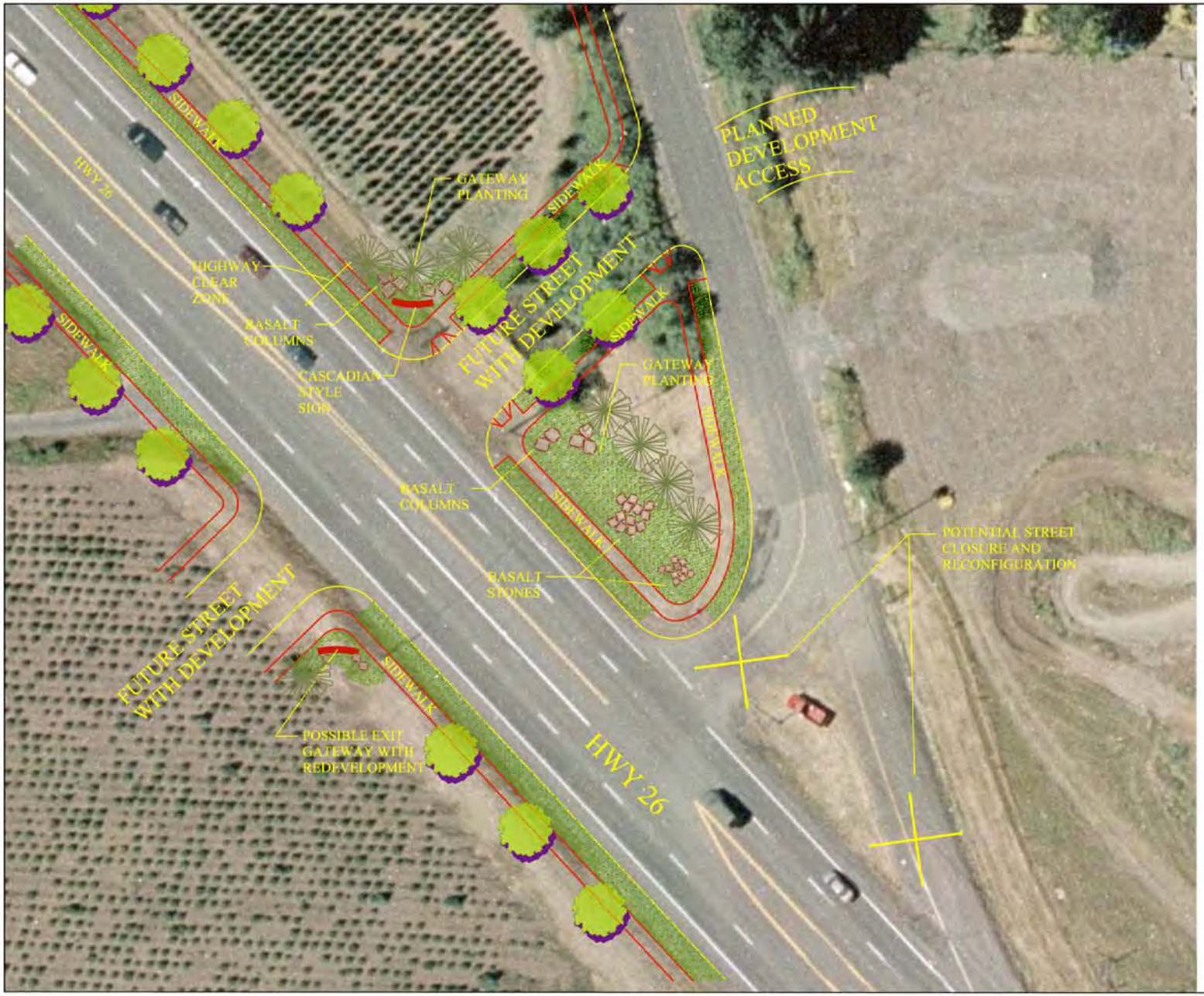
CASCADIAN STYLE SIGN GATEWAY FEATURE

COLUMNAR BASALT GATEWAY FEATURE

FIGURE 6-7

April, 2008

otak



US 26 SANDY GATEWAY PLAN

EAST VISTA LOOP GATEWAY

DESIGN CONSIDERATIONS

This location would be the first of two closely spaced gateways as traffic approaches the downtown core. The location capitalizes the potential to coordinate with new development and streets. As with the other gateways, the design concept uses Cascadian style materials of basalt stone columns, native plantings and entry signage of irregular and fitted stone.

Placement of all gateway signage and basalt columns is subject to ODOT design criteria and required highway clear zones.

CASCADIAN STYLE SIGN
GATEWAY FEATURE

COLUMNAR BASALT
GATEWAY FEATURE

FIGURE 6-8

April, 2008

Photo 6-1A: US 26 Westbound approaching Ruben Lane – Existing Condition

Photo 6-1B: US 26 Westbound approaching Ruben Lane – Fully Improved

Photo 6-2A: US 26 Westbound approaching Ten Eyck Road – Existing Condition

Photo 6-2B: US 26 Westbound approaching Ten Eyck Road – Fully Improved

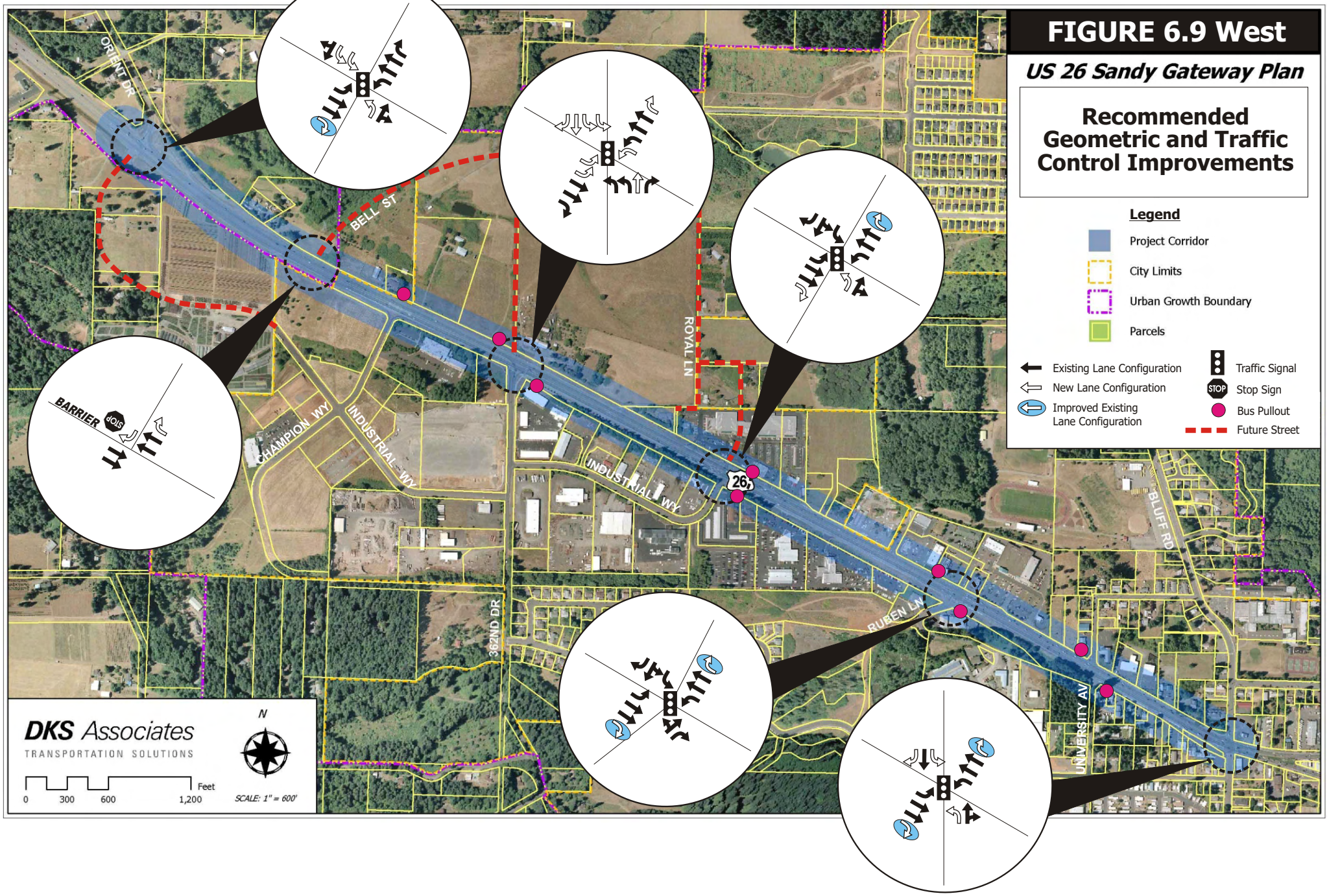


FIGURE 6.9 West
US 26 Sandy Gateway Plan
Recommended Geometric and Traffic Control Improvements
Legend
Project Corridor
City Limits
Urban Growth Boundary
Parcels
Existing Lane Configuration
New Lane Configuration
Improved Existing Lane Configuration
Traffic Signal
Stop Sign
Bus Pullout
Future Street
ORIENT DR
BELL ST
ROYAL LN
BARRIER
CHAMPION WY
INDUSTRIAL WY
INDUSTRIAL WY
362ND DR
RUBEN LN
BLUFF RD
UNIVERSITY AV
26
DKS Associates
TRANSPORTATION SOLUTIONS
N
0 300 600 1,200 Feet
SCALE: 1" = 600'

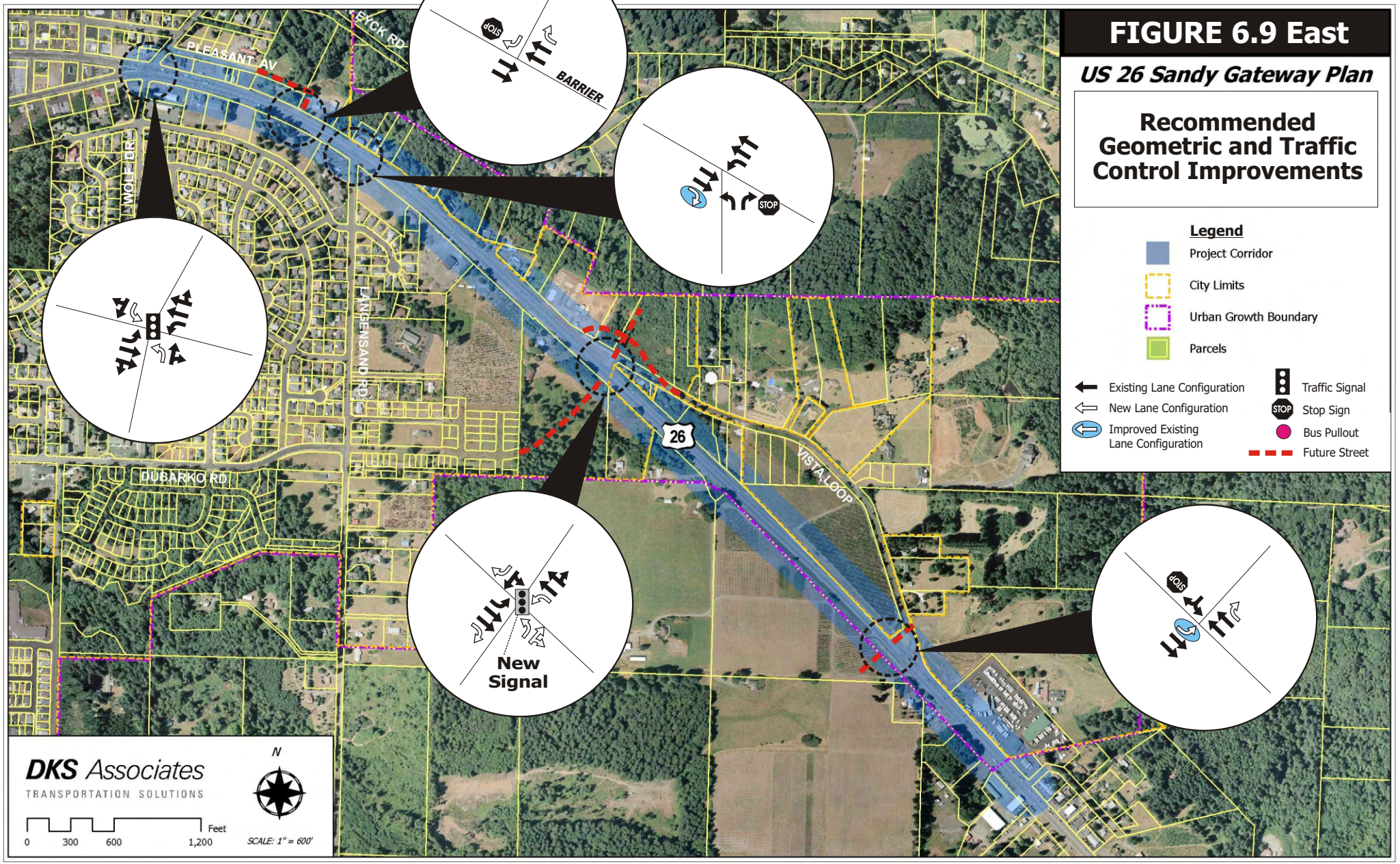


FIGURE 6.9 East
US 26 Sandy Gateway Plan
Recommended Geometric and Traffic Control Improvements
Legend
Project Corridor
City Limits
Urban Growth Boundary
Parcels
Existing Lane Configuration
New Lane Configuration
Improved Existing Lane Configuration
Traffic Signal
Stop Sign
Bus Pullout
Future Street
PLEASANT AV
BYCK RD
WOLF DR
LANGENSAND RD
DUBARKO RD
26
VISTA LOOP
STOP
BARRIER
New Signal
DKS Associates
TRANSPORTATION SOLUTIONS
N
0
300
600
1,200
Feet
SCALE: 1" = 600'

7. Plan Implementation

Overview

The elements of the Sandy Gateway Plan can be implemented through public and private actions taken separately or taken jointly. Public actions might include updating the regulatory framework and public funding. Successful public actions will need receptive property and business owners who may also undertake private actions supportive of the plan and its vision. There will be a continuing need for public support for the Vision and Guiding Principles. Additional community outreach should also be an integral part of implementation.

Successful implementation will also require coordinated actions between the City and ODOT. In general, frontage improvements to curbs, sidewalks, landscaped buffers, and street lighting will be constructed by private development unless previously improved by the City through projects funded by grants or other sources. Grants and other monies will also be used by the City to construct landscaped medians. It is anticipated that landscaped medians would only be constructed by private development where specifically required by ODOT or the City as mitigation for traffic impacts. The construction of all gateways will be funded through grants and matching local funds.

This chapter provides guidance for future implementation of plan improvements, including an assessment of coordination needs with the City Comprehensive Plan, Development Code, and Transportation System Plan, potential variances, and application of access management strategies. Planning-level cost estimates for streetscape elements and a list of potential funding sources have also been provided to aid in the completion of grant applications and project planning.

Comprehensive Plan and Development Code Amendments

The City of Sandy should adopt the US 26 Sandy Gateway Plan as an amendment to the existing Comprehensive Plan. The Gateway Plan would be complementary to the Sandy Style design standards of the Development Code. The most closely related code sections for street frontage and buffer improvements are found in Chapters 17.84.00, 17.90.00, 17.92.00 and 17:100.90 – 17.100.330. Sections 17.90.120 (A) and Chapter 17.98 also provide access management standards for new development along the Sandy gateway corridor (General Commercial, Industrial Park and Light Industrial zoning districts).

Landscape Planting

Enhanced landscape planting is an integral part of US 26 Sandy Gateway Plan and the Sandy Style design standards (Chapter 17.90). Both efforts are compatible in their recommendations and can be coordinated as future development occurs. The General Commercial (C-2), Industrial Park (I-1), and Light Industrial (I-2) Zoning Districts are the most applicable to the project area and the future streetscape enhancements. As specified within 17.90.120(F), the required landscape buffer can include the highway right-of-way and frontage improvements subject to ODOT approval. The City, in consultation with ODOT, will determine tree and plant species for planting within the highway right-of-way. The mixture of plant types listed in this section and guidelines for maintaining business visibility are consistent with the US 26 Sandy Gateway Plan. As previously noted, all concepts illustrated in the Gateway Plan comply with current Highway Design Manual (HDM) standards and other ODOT engineering bulletins. The potential for requesting design exceptions in the future has been noted.

Pedestrian Network

A continuous pedestrian network is essential to the objectives of both the Sandy Style design standards and this plan. Walkways in the highway right-of-way can be either curvilinear or straight. The US 26 Sandy Gateway Plan provides design solutions for topographically challenged sections of street frontage than can be referenced by adoption of the plan. Plan adoption will also include the recommended option for placement of sidewalks in easements on private property is allowed during site plan approvals. The option is a direct outcome of discussions with the Technical Advisory Committee and Citizen Advisory Committee about reconciling HDM clear zone requirements and the City's desire to maintain typical urban area relationships between pedestrian walkways and street trees (see Figure 6-1).

Street Lighting

It has not been ODOT policy to require or to provide street lighting for segments of highway within city limits. For the west and east corridors of the study area, the City of Sandy would be responsible for design, construction, inspection, and energy cost and maintenance of street lighting. The existing street lighting is intermittent at best and consists of ODOT standard highway lighting fixtures.

Street lighting is required in the City's Development Code (17.100.300). The design and spacing of new or replacement lighting will be based on AASHTO guidelines (Guide for Roadway Lighting and Roadway Lighting Design Guide), the City's Dark Sky Ordinance (Chapter 15.30 of the Development Code), and photometric analysis provided as part of the site plan approval process. The US 26 Sandy Gateway Plan has not recommended updates to lighting design standards or development requirements.

Implementation Protocols

Unique existing conditions or constrained right-of-way may require applying a set of protocols to the construction of street improvements with development. City-wide street improvement protocols are already addressed in the current development codes (17.84.30). The recommended protocols for the US 26 Sandy Gateway Plan streetscape improvements are as follows:

- There are no exceptions to the minimum requirements for a continuous pedestrian walkway. Design concepts for topographic challenges have been provided. Construction of new walkways should not result in discontinuous or disjointed walkway segments.
- In constrained rights-of-way, exceptions to US 26 Sandy Gateway Plan streetscape concepts shall generally be in the following order:
    a. Narrow the landscape buffer strip.
    b. Eliminate the buffer strip entirely, resulting in curb-tight sidewalks not less than eight-feet in width (minimum width for curb-tight sidewalks allowed by Highway Design Manual standards). This is contrary to ODOT preferences for sidewalks with buffers and to the objectives of the US 26 Sandy Gateway Plan for improving the pedestrian environment. In these cases, street trees must be placed behind the sidewalk. ODOT will not allow street trees within curb-tight sidewalks.

Suggested Variances

When implementing the streetscape concepts of the US 26 Sandy Gateway Plan, most of the frontage improvements (improvements from the curb line back to the property line) will be done as new development or redevelopment occurs. There will be conditions or circumstances where some variance during planning approvals for the typical frontage requirement is appropriate. The primary variance likely to occur will be with regard to planting new street trees. In addition to the street tree protocols listed above, it is recommended that privately planted and maintained street trees abutting the right-of-way meet the overall objectives of the plan. The existing trees should be a deciduous species and be within the specified spacing standards: 30-foot minimum and 50-foot maximum for public street trees.

In these cases, additional street trees would not be required of development within the public right-of-way unless the right-of-way was used to meet the Sandy Style design standards for landscaping. This variance should not be construed as a variance from those requirements.

Access Management Actions

The access management vision and recommended actions are provided as a communication tool to help convey the long-range goal for the west and east US 26 corridors. However, they are not intended to replace existing policies, rules, and regulations pertaining to access management or the manner in which they are currently implemented. Decisions regarding access modifications will occur according to established practices and adopted policies and regulations, with individual actions being reviewed on a case-by-case basis. Because of this, the achievement of the vision and modifications to individual approaches is anticipated to be an incremental and on-going process, with most changes occurring as the result of land use actions or public improvement projects within the corridors.

It should also be noted that the recommended actions were formed to achieve the vision and that different actions for individual approaches may be desired in the future as circumstances related to property accessibility change. Implementation of access modifications will require coordination between ODOT, the City, and affected property representatives.

Engineering Standards and the Transportation System Plan

The City does not have "engineering standards" applicable to US 26. The Comprehensive Plan, Development Code, and Transportation System Plan (TSP) currently contain the relevant City requirements and would be the regulatory updates to adopt the US 26 Sandy Gateway Plan. This applies even to streetscape elements not required by ODOT but required of development by the City. As previously mentioned, the City of Sandy can request exceptions to these design standards from ODOT through the formal Design Exception process.

To facilitate the implementation of plan recommendations, it is recommended that the US 26 Sandy Gateway Plan be adopted by the City of Sandy as an addendum to the Transportation System Plan. While the TSP is scheduled to undergo a thorough examination and update process beginning in 2008, adoption of the updated TSP is not expected until sometime in 2009. Adoption of the US 26 Sandy Gateway Plan as an addendum to the current TSP will facilitate implementation of design treatments and recommended improvements while the TSP update is in process. When the TSP is later updated, the US 26 Sandy Gateway Plan recommendations can be directly incorporated into it.

Streetscape Element Cost Estimates

Budget-level cost estimates for streetscape and gateway enhancements have been provided in incremental unit costs for frontage improvements and as total project costs for gateways and whole corridor improvements. The increments of frontage costs can be combined in various ways to define probable funding needs for construction and engineering design for projects ranging from a single property frontage to corridor-scale transportation improvement grants or capital improvement projects. A detailed cost break-down in spreadsheet format is included in the appendix. The costs do not reflect any on-going operational or maintenance costs. Prior to implementation of these design features, the City of Sandy and ODOT should reach an agreement as to maintenance responsibilities.

Typical Street Frontage Improvements

Street frontage costs were developed as lineal foot (LF) increments of 100 feet, and on one side of the highway only. The frontage costs were further refined to reflect the highway speed zones that are the basis for the design concepts (Figure 6-1). The improvements would include the design elements from curb to property line. The biggest single variable is the decreasing width of the clear zone, which is assumed to be fully landscaped in each case. In some cases, landscaped clear zone may also meet the buffer requirements of the Sandy Style design standards.

For each speed zone, the 100-foot increment was assumed to include new curbing, new walkway, clear zone/buffer landscaping, two (2) street trees and one (1) standard highway street light plus allowances for clearing and demolition, mobilization, and a construction contingency. Preliminary and final design costs (e.g., a total project budget) were not included.

Estimated Construction Budgets in 2007 Dollars

- 70 mph Design Speed: $33,000 - $37,000 per 100 LF
- 55 mph Design Speed: $30,000 - $33,000 per 100 LF
- 45 mph Design Speed: $27,000 - $30,000 per 100 LF
- 30 mph Design Speed: $22,000 - $25,000 per 100 LF

The landscaping costs for the buffer areas and/or planter strips are a relatively high percentage of the total construction costs. The design concepts for buffer areas are linked to HDM dimensional requirements for a clear zone at the edge of the highway and the landscaped buffer requirement of the Sandy Style design standards. The design concept includes a mixed species understory planting of shrubs and groundcovers for the clear zones that would also meet City requirements for landscape buffers for development. Typically, as the design speed decreases, the clear zone widths decrease with a corresponding decrease in the cost to landscape the buffer areas.

Special Conditions for Walkways

Improvement costs were developed as increments of 100-feet on one side of the highway only. These costs reflect design concepts to address moderate to severe topographic challenges within the highway right-of-way that would make construction of the prototypical street sections impractical (Figures 6-2 and 6-3). The improvements would include the design elements beginning at the curb but not necessarily extending to the property line. There will be significant variations with regard to length and degree of slope, so these estimates should be considered highly conceptual pending definition of a project area and further engineering analysis of existing conditions. Additional variations may occur in the width of the required clear zone. In addition to allowances for retaining walls, earthwork and handrails as needed, each 100-foot increment was assumed to include two (2) street trees and grass or wildflower mix to cover and stabilize slopes associated with walkway construction.

Estimated Construction Budgets in 2007 Dollars

- Condition 1: Walkway below grade: $26,000 - $30,000 per 100 LF
- Condition 2A: Steep slope/buffered walkway: $50,000 - $55,000 per 100 LF
- Condition 2B: Steep slope/curb-tight walkway: $50,000 - $55,000 per 100 LF
- Condition 2C: Steep slope/buffered walkway: $50,000 - $55,000 per 100 LF
- Condition 3: Walkway above grade: $27,000 - $30,000 per 100 LF

Landscaped Medians

Landscaped median costs were also developed in increments of 100 lineal feet (LF). Medians were assumed to be raised to normal street curb height above pavement and to be approximately 12-14 feet wide. Landscaping was assumed to be low shrubs but no street trees.

Estimated Construction Budget in 2007 Dollars: $11,000 - $13,000 per 100 LF

West Gateway

The proposed gateway location is at the intersection of US 26 and Champion Way (Figure 6-4). The concept builds on the existing, small median and the curbed turn lanes at Champion Way. Key design elements are a Cascadian style entry sign shared with the US Forest Service Center and vertical columnar basalt of varying heights to symbolically suggest the community's relationship to Mt. Hood, native landscape planting and special paving treatments. Planning-level cost estimates include construction costs as well as a project cost allowance for preliminary and final engineering design and permitting. The estimate does not include any roadway improvements or new roadway costs at or near the gateway location.

Estimated Total Project Budget in 2007 Dollars: $350,000 - $365,000

West Vista Loop Gateway

There are two proposed gateway locations associated with Vista Loop Drive intersecting US 26. Design features include native landscape planting, irregular columns of basalt stone as symbolic "totem" elements, and Cascadian style signage (Figure 6-7). At the western location, the concept captures spaces created at the corners of a new intersection configuration that will occur with development and roadside space already owned and maintained by ODOT. Planning-level cost estimates include construction costs as well as a project cost allowance for preliminary and final engineering design and permitting.

Estimated Total Project Budget in 2007 Dollars: $180,000 - $190,000

East Vista Loop Gateway

The eastern location could be developed in conjunction with planned land use developments and a new four-way intersection at this location (Figure 6-8). The gateway could be a 'four corners' feature. As with other gateways, the primary palette of materials is native landscape planting, columnar basalt as symbolic "totem" elements, Cascadian style signage and native landscape planting. Planning-level cost estimates include construction costs as well as a project cost allowance for preliminary and final engineering design and permitting.

Estimated Total Project Budget in 2007 Dollars: $145,000 - $155,000

West Corridor Improvement Project

The West Corridor of the project area is defined as Bluff Road to Orient Drive. An aggregate project budget for streetscape improvements was developed using the cost data above. The streetscape improvement elements include frontage improvements to both sides of the highway that are consistent with the design concepts and as previously described, landscape medians as approximately shown in Maps 1 through 3 of the long-range access management vision, a gateway at Champion Way and intersection improvements at University Avenue.

This planning-level cost estimate does not reflect any intent on the part of the City of Sandy or ODOT to publicly fund an improvement project for the entire West Corridor. That is an unlikely scenario. The intent is to provide an order of magnitude cost for both private development and public projects to create a new streetscape for US 26 between Bluff Road and Orient Drive. Unlike the planning cost estimates above, this cost includes an allowance for Preliminary Engineering costs at 15%, Construction Engineering costs at 20% and additional 5% for permitting costs.

Estimated Total Project Budget in 2007 Dollars: $8,400,000 – $8,700,000

East Corridor Improvement Project

The East Corridor of the project area is defined as Ten Eyck to Luzon Drive. An aggregate project budget for streetscape improvements was developed using the cost data above. As with the West Corridor Project, this project cost does not reflect any intent on the part of the

City of Sandy or ODOT to publicly fund an improvement project for the entire West Corridor. The intent is to provide an order of magnitude cost for both private development and public projects, including an allowance for preliminary and final engineering design and permitting for a project of this magnitude.

The streetscape improvement elements include frontage improvements to both sides of the highway that are consistent with the design concepts and as previously described, frontage special conditions, landscape medians as approximately shown in Maps 4 through 6 of the long-range access management vision, and gateway construction at East and West Vista Loop.

Estimated Total Project Budget in 2007 Dollars: $8,100,000 - $8,300,000

Potential Funding Sources

Transportation improvement projects can be funded by a variety of sources, including urban renewal funds, grants, and other federal and state programs. Federal funds for transportation and infrastructure improvements are derived through the Economic Development Administration (EDA), the Housing and Urban Development Administration (HUD), and through the US Department of Transportation, Federal Transportation Administration (FTA). Access to federal grants is typically obtained through county or state governmental bodies, such as Clackamas County, Oregon Economic Development Department, and Oregon Department of Transportation.

State funding, financing, and technical assistance are provided through Oregon Economic and Community Development (OECD), Oregon Department of Transportation (ODOT), and other programs.

The following matrix provides funding "possibilities" available for consideration for implementing larger and contiguous highway improvement projects rather than development frontage and mitigation improvements. It should be noted that the awarding of grants often requires the provision of matching local funds. Therefore, when planning on utilizing grant funds for future projects, matching funds from other non-grant sources should be identified as well.

Table 7.1: Potential Funding Sources

Funding Source/ Contact	Program Description
Grants	
Transportation Enhancement Program	The Transportation Enhancement program provides federal highway funds for projects that strengthen the cultural, aesthetic, or environmental value of our transportation system. The funds are available for twelve "transportation enhancement activities" specifically identified in the Transportation Equity Act for the 21st Century (TEA-21). These activities fall into four main groups: • Pedestrian and Bicycle Projects • Historic Preservation related to surface transportation • Landscaping and Scenic Beautification • Environmental Mitigation (highway runoff and wildlife protection only) The intent of the program is to fund special or additional activities not normally required on a highway or transportation project. Transportation Enhancement or "TE" projects are selected through a competitive process. The funds are provided through reimbursement, not grants. Participation requires matching funds from the project sponsor. Applications are accepted only from public agencies. All projects must have a direct relationship to surface transportation.
ODOT Pedestrian and Bicycle Improvement Grant Program	Grant funds for highways, county roads, and local streets where improvements are needed for bicycle and pedestrians and/or bicyclists. Eligible project types include: ADA upgrades; completing short sections of missing sidewalks or bike lanes; street crossing improvements; intersection improvements; and minor widening for bike lanes or shoulders. Grant awards are attainable up to $200,000 based on past trends.
Local	
Local Capital Improvement Program	City can fund public facilities using general funds or dedicated revenues. However, this is not usually applicable, since general funds are usually "over committed" by various city services.
Transportation System Development Charges (SDC)	A transportation system development charge or traffic impact fee can be charged to new development to pay for capacity improvements needed to serve new development. Cities throughout Oregon use transportation system development charges or impact fees to assist in funding traffic and transportation improvements related to the development.
Local Improvement Districts (LID)	LIDs can be formed by petition and subsequent legislative action. They often finance public infrastructure (roads, sewer, water, etc.) using guaranteed payments from affected properties with a lien placed on those properties until the LID share is paid off. They typically require approval of at least 51% of affected properties.

Funding Source/ Contact	Program Description
Urban Renewal District	Urban Renewal Districts can be formed by legislative action under Oregon law (with acknowledgment of an Urban Renewal Plan). Project financing is secured through dedication of increases in tax increment revenues in the affected district.
General Obligation Bonds (G.O. Bonds)	Voter approved bonds are often sold by a municipal government to fund transportation (or other types) of improvements, and are repaid with property tax revenue generated by that local government. Cities use this method to finance construction of transportation improvements. For smaller jurisdictions, underwriting costs can become a high percentage of the total financing cost for bond issues. Bond Pools, such as those associated with the Oregon Infrastructure Bank, assist small jurisdictions by pooling together small bond issues for economies of scale with lower financing costs.

Appendix A - Table A: US 26 Existing Approach Physical Inventory

Table A: US 26 Existing Approach Physical Inventory

Approach Number	Side of Hwy	Eng. Station	Highway Milepoint	Width (ft)	Material	Public/ Private	Tax Lot #	Property Owner(s)	Address	Business Name	Use
US 26: West Corridor											
1	North	33+717	22.15	80	AC	Public	-	-	-	-	SE Orient Drive
2	North	685+65	22.37	30	AC	Private	24E10 05301	Sherlynn Carpenter	39495 SE Hwy 26	-	residential
							24E10 05302	Timothy Smith	35481 SE Hwy 26	-	residential
3	North	689+35	22.44	25	AC	Private	24010 05300	Gordon & Dolores Smith		-	grass field
4	North	695+15	22.55	40	AC	Private	24E10 05601, 24E10 05602	Thomas & Diane Seipert	35801 SE Hwy 26	-	residential
5	North	698+30	22.61	35	AC	Private	24E10 05600, 24E10 05603	Lila Leathers	35881 SE Hwy 26	-	residential
6	North	707+80	22.79	30	AC	Private	24E11 03200	Josephine Lundeen LLC	36405 SE Hwy 26	Luden Steel	equipment storage
7	North	713+10	22.89	125	AC	Private	-	-	-	-	SE Royal Lane
8	North	716+85	22.97	50	AC/CDP	Private	24E14 01000, 24E14 00901	Jennifer Betz	36645A & B	Sandy Animal Clinic	animal clinic and unknown
9	North	720+25	23.03	15	CDP	Private	24E14BA00800	Deloittee & Touche LLP	36641	2 Margaritas & Sandy Mrktplc	restaurant and strip mall
10	North	723+12	23.08	80	CDP	Private	24E14BA00800	Deloittee & Touche LLP	36701	Sandy Marketplace	strip mall
11	North	726+82	23.15	20	CDP	Private	24E14BA00800, 24E14BA00700	Deloittee & Touche LLP	36911	Sandy Marketplace	strip mall
12	North	730+52	23.22	45	CDP	Private	24E14BA00300	PLR Properties LLC	37095 Hwy 26	Mt Hood Athletic Club	athletic club
							24E14BA00100, 24E14BA00200, 24E14BA00400, 24E14BA00500, 24E14BA00600	Paul & Lila Reed	37115, 37101, 37133, 37139, 37151		
13	North	733+16	23.27	35	CDP	Private	24E14 00500	Olaf Oja Lumber Co	37210 SE Hwy 26	Olaf Oja Lumber Co	building supply
14	North	735+80	23.32	35	CDP	Private	24E14 00500	Olaf Oja Lumber Co	37210 SE Hwy 26	Olaf Oja Lumber Co	building supply
15	North	736+55	23.33	65	AC	Public	-	-	-	-	Kate Schmitz Avenue
16	North	743+10	23.45	70	CDP	Private	24E14 00203	Bradford Picking	37317 Hwy 26	Taco Bell	fast food restaurant
							24E14 00200, 24E14 00300	Bradford Picking	37601 Hwy 26	Safeway	grocery store & stripmall
							24E14 00400, 24E14 00402	Bradford Picking	37495 Hwy 26	Kentucky Fried Chicken	fast food restaurant
							24E14 00401, 24E14 00401	McDonalds Corp	37445 Hwy 26	McDonalds	fast food restaurant
17	North	746+27	23.51	40	CDP	Private	24E14 00300	Bradford Picking	37601 Hwy 26	Safeway	grocery store & stripmall
18	North	748+38	23.55	60	CDP	Private	24E14 00300	Bradford Picking	37601, 37695	Safeway/Jiffy Lube	strip mall and car care
19	North	750+80	23.60	20	CDP	Private	24E14AA01800, 24E14AD02400	Sandy Cemetary Assn	37755 Hwy 26	Firhill Cemetary	cemetary
							24E14AD02500	Scandanavian Cemetary Assn	37715 Hwy 26	Firhill Cemetary	cemetary
20	North	753+45	23.65	70	AC	Public	-	-	-	-	University Avenue
21	North	756+62	23.71	40	CDP	Private	24E14AD01700, 24E14AD01600	Les Schwab	37895	Les Schwab	car care
22	North	759+26	23.76	50	CDP	Private	24E14AD01000, 24E14AD00902	Paola Joyce	38015 Hwy 26	Paola's Pizza & Barn Antiques	restaurant/ antiques
23	North	760+32	23.78	15	CDP	Private	24E14AD00900	Dorothy Depro	38105 Hwy 26	-	residential
24	North	762+45	23.82	15	CDP	Private	24E14AD00900	Dorothy Depro	38105 Hwy 26	-	residential
25	North	764+91	23.87	60	AC	Public	-	-	-	-	Bluff Road

Table A: US 26 Existing Approach Physical Inventory (continued)

Approach Number	Side of Hwy	Eng. Station	Highway Milepoint	Width (ft)	Material	Public/ Private	Tax Lot #	Property Owner(s)	Address	Business Name	Use
26	South	764+91	23.87	50	AC	Public	-	-	-	-	Bluff Road
27	South	762+27	23.82	35	CDP	Private	24E14AD04800, 24E14AD05400	John Sowski	38100 Hwy 26	Tollgate Inn	gifts/eat/various
28	South	760+67	23.79	25	CDP	Private	24E14AD00901, 24E14AD04300, 24E14AD04600	Tollgate Inn Development Inc	38050 Hwy 26	Tollgate Inn	gifts/eat/various
29	South	759+09	23.76	20	CDP	Private	24E14AD04200, 24E14AD04600	Leathers Limited Partnership			(empty lot)
30	South	758+03	23.74	20	CDP	Private	24E14AD3400, 24E14AD03900, 24E14AD03901	Alpine Investment Properties LLC	37950 Hwy 26	Alpine Village Duplexes	residential
31	South	757+30	23.72	20	CDP	Private	24E14AD03800	James & Charlotte Lazzeroni	37930	-	residential
32	South	756+10	23.70	20	CDP	Private	24E14AD03700	Paluck Paluck & Gregus LLC	37860, 37820, 37880	-	residential
33	South	755+38	23.69	20	CDP	Private	24E14AD03600	Paluck Paluck & Gregus LLC	37850	-	residential
34	South	754+50	23.67	20	CDP	Private	24E14AD03600	Paluck Paluck & Gregus LLC	37850	-	residential
35	South	753+45	23.65	70	AC	Public	-	-	-	-	University Avenue
36	South	743+10	23.45	70	AC	Public	-	-	-	-	Ruben Lane
37	South	732+10	23.25	50	CDP	Private	24E14 01103, 24E14 01126	Jaksich Properties LLC	37000 Hwy 26	Suburban Ford	car dealership
38	South	728+40	23.18	50	CDP	Private	24E14 01102, 24E14 01127	Jaksich Properties LLC	36900 Hwy 26	Suburban Cheverolet	car dealership
39	South	723+12	23.08	65	AC	Public	-	-	-	-	Industrial Way
40	South	705+17	22.74	95	AC	Public	-	-	-	-	SE 362nd Avenue
41	South	695+14	22.55	15	AC	Public	-	-	-	-	Champion Way
42	South	685+10	22.36	35	AC	Private	24E10 05100	Steven & Brenda Sobella	35490 SE Hwy 26	Sobella Farms	tree nursery
43	South	35+717	22.15	60	AC	Public	-	-	-	-	SE Jarl Road
US 26: East Corridor											
44	North	804+20	24.61	70	AC	Public	-	-	-	-	SE Ten Eyck Road
45	North	1+60	24.64				24E13AD01001	Denbar, LLC	39831Hwy 26	Hood View Mountain Sports	unused driveway to commercial
46	North	4+75	24.70	30	AC	Private	24E13AD01000	Jerry & Nancy Jaksich			(closed/gated)
47	North	8+45	24.99	20	gravel	Private	24E13AD01300, 24E13AD01390	Ford Development Inc	39955 Pleasant St		open lot (?)
48	North	10+56	25.03	25	AC	Private	24E13AD01400	Judy Junkins Trustee	40155 Hwy 26	-	residential
49	North	14+65	25.11	25	AC	Private	24E13AD01500, 25E18CB00900	Sally Smoke Trust	40195		residential
							25E18CB01000	Perry Fink	40235	-	residential
50	North	15+69	25.13	50	AC	Private	25E18CB00800	Michael & Daphne Teel	40245	-	residential
							25E18CB01000	Perry Fink	40235	-	residential
51	North	17+00	25.15	15	AC	Private	25E18CB00700	Gary Delco	40283	-	residential
52	North	20+24	25.21	25	AC	Private	25E18CB00500, 25E18CB00600	John & Margaret Bromley	40405	-	residential
53	North	23+06	25.27	25	AC	Private	25E18CB00400	Jo Ann Allen Trustee	40475	-	residential

Table A: US 26 Existing Approach Physical Inventory (continued)

Approach Number	Side of Hwy	Eng. Station	Highway Milepoint	Width (ft)	Material	Public/ Private	Tax Lot #	Property Owner(s)	Address	Business Name	Use
54	North	25+52	25.31	15	gravel	Private	25E18CB00300	Robert & Gretchen Halterman	40605 SE Hwy 26	-	residential
55	North	26+58	25.33	30	AC	Private	25E18CB00300	Robert & Gretchen Halterman	40605 SE Hwy 26	-	residential
			25.33				25E18CB00100	Susan Dudley	40625	-	residential
56	North	27+65	25.35	20	AC	Private	25E18CB00200	Douglas & Kristen Lindsay	40665	-	residential
57	North	28+72	25.37	30	grass	Private	25E18CD00800	Caritas Community Housing Corp	40747	-	emergency access/ residential
58	North	34+28	25.48			Private	25E18CD00800	Caritas Community Housing Corp	40747	-	residential (access on Vista Loop in ROW)
59	North	38+51	25.56	30	AC	Public	-	-	-	-	SE Vista Loop Drive (west)
60	North	67+00	26.10	35	AC	Public	-	-	-	-	SE Vista Loop Drive (east)
61	North	70+75	26.17	60	AC	Private	25E19 00202	Cory & Joan Stone	41777 Hwy 26	Fred's RV World	RV sales
62	North	77+48	26.30	45	AC	Private	25E19AD01101	Michael E & Carole L Modjeski	41951 Hwy 26	Fred's RV World, Deane's Auto Repair	RV sales/ Auto Repair
63	North	79+45	26.33	35	AC	Public	-	-	-	-	SE Luzon Lane
64	South	79+16	26.33	40	AC	Private	25E19AD01403	Jerald Carlson	41880	George's Sandy Muffler & Brakes	car repair
65	South	76+78	26.28	30	AC	Private	25E19AD01403	Jerald Carlson	41880	George's Sandy Muffler & Brakes	car repair
66	South	75+42	26.26	15	gravel	Private	25E19AD01400, 25E19AD01500	Russell & Lorna Markwart	41850		
			26.21				25E19AD01401	Charter Communications	41900 SE Hwy 26		residential
67	South	72+75	26.21	15	gravel	Private	25E19AD01300	H G Klinger	41730		residential
68	South	70+95	26.17	20	gravel	Private	25E19AD01300	H G Klinger	41730		(empty lot)
69	South	69+39	26.14	50	gravel	Private	25E19 00700	Lori Neumann	41690	-	residential
			26.05				25E19 00701	William Knapp	41698 SE Hwy 26	-	residential
70	South	64+45	26.05	25	AC	Private	25E19 00600	William Knapp			tree farm
71	South	49+78	25.77	30	AC	Private	25E19 00701	William Knapp	41698		residential
							25E19 00900	William Knapp	41160	-	residential
72	South	48+08	25.74	30	AC	Private	25ECD01100	B&M Lenz Rev Liv Trust	41224 SE Hwy 26	-	residential
73	South	39+67	25.58	40	AC	Private	25E18CD01000	Vista Loop Properties LLC	41010 SE Hwy 26	-	residential
74	South	33+99	25.47	20	AC	Private	25E18CD00900	Holt Homes Inc	40808	-	residential
75	South	26+76	25.34	30	AC	Private	25E18CC00100			-	residential (to be replaced by subdivision)
76	South	24+19	25.29	40	AC	Private	25E18CB01500	ODOT			sand/gravel
77	South	20+17	25.21	20	gravel	Private	25E18CB01101	Clark Wolf	40350		residential
							25E18CB01102	Bhupendra & Neela Patel			
							25E18CB01400	Ruby Eliason	40360 Hwy 26	-	residential

Table A: US 26 Existing Approach Physical Inventory (continued)

Approach Number	Side of Hwy	Eng. Station	Highway Milepoint	Width (ft)	Material	Public/ Private	Tax Lot #	Property Owner(s)	Address	Business Name	Use
78	South	15+35	25.12	50	AC	Public	-	-	-	-	SE Langensand Road
79	South	12+95	25.07	25	CDP	Private	24E13DA00502 24E13DA00462	Avamere Health Services Sandy Villas LLC	17727 Langensand Rd	Avamere at Sandy	retirement housing (emergency only) vacant (proposed cottages)
80	South	3+17	24.67	140	AC	Private	24E13DA00200, 24E13DA00300, 24E13DA00464	Sandy Assembly of God	39800 Hwy 26	Sandy Assembly of God	church
81	South	2+65	24.66	30	AC	Private	24E13DA00100	Charles Smith	39750 Pioneer Blvd	Mt Hood Outdoors	sporting goods
82	South	804+20	24.61	40	AC	Public	-	-	-	-	Wolf Drive

Material Code: AC = Asphalt, CDP = Concrete Dust Pan

Appendix B - Table B: US 26 Existing Approach Access Rights

Table B: US 26 Existing Approach Access Rights

Approach Number	Side of Highway	Approach Permits					Right of Way Research				
		Permit No.	Applicant	Hwy MP	Hwy Station	Approved/ Completion Date	R/W File No.	Tax Lot	Reservation Station	Reservation Width	Comments
US 26: West Corridor											
1	North	-	-	-	-	-	-	-	-	-	Orient Drive (Uncontrolled)
2	North	-	-	-	-	-	33421	5300 & 5301	685+40	25'	Subject to frontage road language
3	North	8815	Hallgren W.	22.43	127+50	8/14/58	33421 & 3342	-	689+37	20'	Access to BPA easement only
-	North	-	-	-	-	-	34584	5600, 5601, 5602, 5603	691+30	35'	Controlled to parcel
4	North	-	-	-	-	-	34584	5600, 5601, 5602, 5603	694+90	35'	Controlled to parcel
5	North	-	-	-	-	-	34584	5600, 5601, 5602, 5603	697+90	35'	Indentured, controlled to parcel
-	North	-	-	-	-	-	34584	5600, 5601, 5602, 5603	704+90	35'	Controlled to parcel
6	North	grandfathered	-	-	-	1915	34587	3200	707+15	35'	Controlled to parcel
7	North	-	-	-	-	-	-	-	-	-	No reservation present
8	North	52666	Jennifer Betz	23.00	718+00	7/10/06	34589	901, 1000	716+50	35'	Indentured, controlled to parcel, subject to frontage road language
9	North	-	-	-	-	-	34589	700, 800	720+17	40'	Indentured
10	North	28700	Mercury Development	23.07	723+05	6/21/84	34589	700, 800	722+91	60'	Indentured
11	North	-	-	-	-	-	34589	700, 800	726+61	60'	Indentured
12	North	52364	John Arth	23.22	730+73	9/30/05	34590	100, 300, 600	730+73	40'	Indentured, controlled to parcel, subject to frontage road language
13	North	12865	Alvin Bakke	23.27	82+92	4/12/63	34591	500	732+83	35'	Indentured, controlled to parcel
14	North	12865	Alvin Bakke	23.30	83+53	4/12/63	34591	500	735+80	35'	Controlled to parcel
15	North	-	-	-	-	-	37083	100	736+35	35'	Controlled to highway
16	North	29603	Picking B.	23.43	742+09	5/22/86	34593	203, 300, 400, 401, 402	742+10	50'	Indentured, controlled to highway
17	North	29603	Picking B.	23.50	745+55	5/22/86	34593	203, 300, 400, 401, 402	745+55	40'	Indentured, controlled to highway
18	North	29603	Picking B.	23.54	747+68	5/22/86	34593	203, 300, 400, 401, 402	747+68	40'	Controlled to highway
19	North	156	A. Bakke	23.59	72+00	4/3/50	37084	2500	750+50	35'	Controlled to highway, subject to frontage road language
-	North	-	-	-	-	-	37130	2400	750+60	35'	Controlled to highway, subject to frontage road language
20	North	-	-	-	-	-	-	-	-	-	University Ave. (Uncontrolled)
-	North	-	-	-	-	-	37132	1700	756+00	40'	Controlled to highway, subject to frontage road language
21	North	35140	Les Schwab	23.71	756+85	10/28/94	37133	1600	756+86	35'	Indentured, controlled to highway, subject to frontage road language
22	North	-	-	-	-	-	37134	1000	759+40	35'	Controlled to highway, subject to frontage road language

Table B: US 26 Existing Approach Access Rights (continued)

Approach Number	Side of Highway	Approach Permits					Right of Way Research				
		Permit No.	Applicant	Hwy MP	Hwy Station	Approved/ Completion Date	R/W File No.	Tax Lot	Reservation Station	Reservation Width	Comments
23	North	grandfathered	-	-	-	1925	34604, 346	900, 902, 4800, 5400	760+50	35'	Controlled to parcel, subject to frontage road language
24	North	grandfathered	-	-	-	1925	34604, 346	900, 902, 4800, 5400	762+25	35'	Controlled to parcel, subject to frontage road language
25	North	-	-	-	-	-	-	-	-	-	Bluff Road (Uncontrolled)
26	South	-	-	-	-	-	-	-	-	-	Bluff Road (Uncontrolled)
-	South	-	-	-	-	-	34604, 346	900, 902, 4800, 5400	763+60	35'	Controlled to parcel, subject to frontage road language
27	South	26052	Ron Lesowski	23.84	763+11	2/24/80	34604, 346	900, 902, 4800, 5400	762+50	35'	Controlled to parcel, subject to frontage road language
-	South	-	-	-	-	-	34604, 346	900, 902, 4800, 5400	761+65	30'	Controlled to parcel, subject to frontage road language
28	South	50712	Ron Lesowski	23.80	761+18	5/17/02	34603	4600	760+40	35'	Indentured, controlled to highway
29	South	-	-	-	-	-	34602	4200, 4300	759+50	35'	Controlled to parcel, subject to frontage road language
30	South	-	-	-	-	-	34601	3900, 3901	758+56	35'	Subject to frontage road language
31	South	grandfathered	-	-	-	1944	34600	3800	757+31	35'	Controlled to parcel, subject to frontage road language
32	South	-	-	-	-	-	34599	3600, 3700	756+00	35'	Controlled to parcel, subject to frontage road language
33	South	-	-	-	-	-	34599	3600, 3700	755+58	35'	Indenture & Grant, Controlled to parcel, subject to frontage road language
34	South	-	-	-	-	-	34599	3600, 3700	755+08	35'	Indenture & Grant, Controlled to parcel, subject to frontage road language
35	South	-	-	-	-	-	-	-	-	-	University Ave. (Uncontrolled)
36	South	-	-	-	-	-	34595	1401, 1402	742+35	35'	Controlled to highway (Ruben Lane)
-	South	-	-	-	-	-	34595	1401, 1402	741+90	35'	Controlled to highway (Ruben Lane)
-	South	-	-	-	-	-	34588	1103, 1402	738+75	35'	Controlled to parcel, subject to frontage road language
-	South	-	-	-	-	-	34588	1102, 1126	736+37	35'	Controlled to parcel, subject to frontage road language
37	South	35130	Suburban Ford	23.24	731+60	8/17/94	34588	1128, 1129	731+60	40'	Indenture, Controlled to parcel, subject to frontage road language
38	South	35332	Suburban Chevrolet	23.17	728+10	6/25/99	34588	1110, 1100	728+15	35'	Indenture, Controlled to parcel, subject to frontage road language
39	South	-	-	-	-	-	34588	1123, 1114, 1113	723+05	35'	Industrial Way (Controlled to parcel, subject to frontage road language)
-	South	-	-	-	-	-	34588	16600, 1120, 1121	716+08	35'	Controlled to parcel, subject to frontage road language
40	South	-	-	-	-	-	-	-	-	-	362nd Ave. (Uncontrolled)

Table B: US 26 Existing Approach Access Rights (continued)

Approach Number	Side of Highway	Approach Permits					Right of Way Research				
		Permit No.	Applicant	Hwy MP	Hwy Station	Approved/ Completion Date	R/W File No.	Tax Lot	Reservation Station	Reservation Width	Comments
-	South	-	-	-	-	-	34585	5700	700+65	35'	Controlled to highway, subject to frontage road language
41	South	35252	City of Sandy	22.55	696+29	12/3/97	34585	5700	696+65	35'	Champion Way (Controlled to highway, subject to frontage road language)
-	South	-	-	-	-	-	34585	5700	691+75	35'	Controlled to highway, subject to frontage road language
-	South	-	-	-	-	-	33422	209	691+60	25'	Subject to frontage road language
-	South	-	-	-	-	-	33421 & 3342	-	688+97	20'	Access to BPA easement only
42	South	31199	Sobella Farms	22.40	687+50	3/21/89	33419	5100	686+67	25'	No control to frontage road which abuts the remainder property at the NW corner; subject to future frontage road language
43	South	-	-	-	-	-	-	-	-	-	Jarl Road (Uncontrolled)
US 26: East Corridor											
44	North	-	-	-	-	-					
45	North	13476	Glos Ford	24.64	1+99	8/22/63	20055		1+99	40'	Unrestricted
46	North	13476	Glos Ford	24.70	5+12	8/22/63	20055		5+12	35'	Unrestricted
47	North	5239	RS Smith Motors	24.75	12+30	8/11/54	20055		8+75	25'	Subject to frontage road language; production & transportation of agricultural and timber products & ordinary residential purposes only
48	North	13187	Alan Gunderson	25.03	10+85	8/14/63	20055		10+85	25'	production & transportation of agricultural and timber products & ordinary residential purposes only
49	North	-	-	-	-	-	25405	900 & 1000	15+10	25'	subject to frontage road language
50	North	grandfathered	-	-	-	1935	25405	900 & 1000	16+00	25'	
	North						25406	800	16+40	25'	subject to frontage road language; private residential use only
51	North	4139	Arnspiger	25.29	18+00	6/10/53	25407	700	17+20	25'	subject to frontage road language; private residential use only
52	North	-	-	-	-	-	25409	400, 500, 600	20+50	25'	subject to frontage road language; private residential use only
53	North	4974	Emerson	25.39	23+37	5/25/54	25409	400, 500, 600	23+00	25'	private residential use only
54	North	grandfathered	-	-	-	1940					
55	North	grandfathered	-	-	-	1902					
56	North	grandfathered	-	-	-	1925	25411	200	28+50	25'	subject to frontage road language; ordinary residential purposes only
	North						25413	800, 801	30+80	35'	subject to frontage road language
57	North	51344	Robert Mosier	25.46	33+15	5/5/04	25413	800, 801	33+15	25'	emergency/fire vehicles only
58	North	51345	Robert Mosier	25.51	35+73	5/5/04	25413	800, 801	35+73	35'	access to Vista Loop Road in ROW

Table B: US 26 Existing Approach Access Rights (continued)

Approach Number	Side of Highway	Approach Permits					Right of Way Research				
		Permit No.	Applicant	Hwy MP	Hwy Station	Approved/ Completion Date	R/W File No.	Tax Lot	Reservation Station	Reservation Width	Comments
59	North	-	-	-	-	-					
60	North	-	-	-	-	-					
61	North	50689	Jeff Smith	26.16	70+50	6/20/01	25421 & 25422	200 & 202	70+50	35'	Modification of Access Rights
62	North	29592	Brad Picking	26.30	77+50	5/20/86	25421 & 25422	1101	77+50	35'	Includes frontage road language.
63	North	-	-	-	-	-					
	South						25425	1403 & 1700	79+90	100'	Includes frontage road language.
64	South	-	-	-	-	-					
65	South	-	-	-	-	-	25423	1300, 1400, 1403, 1500	77+00	25'	Ordinary residential purposes; Only (TL1400).
66	South	-	-	-	-	-	25423	1300, 1400, 1403, 1500	75+60	25'	Ordinary residential purposes; Only (TL1500).
67	South	grandfathered	-	-	-	1938	25423	1300, 1400, 1403, 1500	73+00	25'	Ordinary residential purposes; Only (TL1300).
68	South	grandfathered	-	-	-	1938	25423	1300, 1400, 1403, 1500	71+00	25'	Ordinary residential purposes; Only (TL1300); Includes frontage road language.
69	South	-	-	-	-	-	25420	700	69+50	25'	Subject to frontage road language; private residential use only.
	South						25419	500 & 600	67+00	25'	Production and transportation of agricultural products and for ordinary residential purposes only.
70	South	-	-	-	-	-					
71	South	-	-	-	-	-	25419	500 & 600	50+50	25'	Subject to frontage road language; production and transportation of agricultural products and for ordinary residential purposes only.
	South						25417	900	49+50	25'	Subject to frontage road language; production and transportation of agricultural products and for ordinary residential purposes only.
72	South	-	-	-	-	-	25416	1100, 1300, 1400, 1401	48+40	25'	Subject to frontage road language; Completely restricted from Sta. 47+00 - 49+00 per B&S Deed (ODOT to Walberg)
	South						25415	1000 & 1200	43+00	25'	subject to frontage road language; ordinary residential purposes only
73	South	8619	Erickson	25.55	40+50	5/28/58					

Appendix C - Improvements Toolbox

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Improvements Toolbox

To address noted deficiencies and needs, a collection of potential mitigation measures has been provided below. While not all applications will be appropriate for these study areas, this list will provide a menu of options for consideration.

Access Management

Move Approaches to Lesser Class Facilities

The intended function of US 26 is primarily for safe and efficient passage for through traffic. Therefore, direct property access should be taken from facilities of a lower classification, such as a minor arterial, collector, or local street. This, in turn, lessens the number of potential conflict points on the highway and moves them to a lower speed, lower volume roadway where they can be more easily accommodated.

This treatment is often a good option for properties that have frontage along an alternate roadway of a lower functional classification. However, where existing site circulation or building locations create a dependency for the pre-existing highway access, the ability to change site access may require total or partial site redevelopment. Also, before access is reestablished to a side street, it should be confirmed that there would be adequate separation between the new driveway and the intersection with the highway to avoid turning conflicts or frequent obstruction by vehicle queues.

Consolidate Multiple Approaches to Single Properties

A common method of reducing approach density is to eliminate multiple approaches to a single property where feasible. This can be done where it has been determined that the property can adequately be served with fewer approaches than it currently maintains. However, where existing site circulation or building locations create a dependency for the pre-existing highway access, the ability to change site access may require total or partial site redevelopment.

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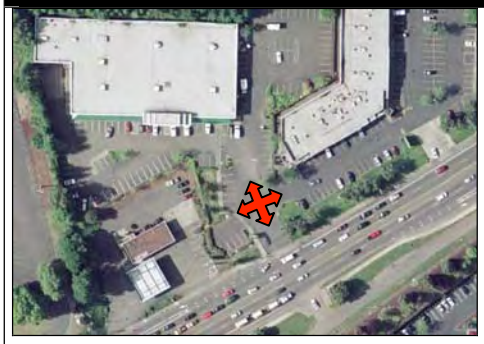
Create Shared Approaches to Properties using Easements



Sharing an approach to the highway is a means of consolidating approaches while providing direct access to properties that might not otherwise have it. This tool is most advantageous when applied between two "landlocked" properties that have no other means of reasonable access than to the highway. Such properties would typically be provided their own approach. However, when a shared approach can be arranged, the end result is only one approach to the highway rather than two.

Because such arrangements require the establishment of access easements, which represent an encumbrance on the property, this can be a difficult tool to apply and is often undesirable for the property owner. Also, because easements can be voided later by the property owners, the long-term success of these arrangements is uncertain. Because of this, it is often easiest to establish shared approaches in situations where one property has reasonable alternate access and, therefore, has an interest in providing an easement to a neighboring property so direct highway access can be gained.

Provide Alternate Access through Improved Local Street Connectivity

Reasonable alternate access can be provided where it does not currently exist by constructing new roadways adjacent to properties that abut the highway. Such roadways can take the form of frontage roads, backage roads, or can simply be new collector or local streets.

When constructing new roadways, topography, environmentally sensitive areas, and existing development patterns should be taken into consideration. Furthermore, as new road alignments are laid out, consideration should be given to the size of remaining properties to ensure sufficient development potential is retained. Also, property approaches to the new roadways should be located far enough from intersections with the highway to avoid turning conflicts or frequent obstruction by vehicle queues.

Create Shared Approaches to Properties under Common Ownership	
(see above graphic)	The concept of this tool is the same as the one above, but when the properties in question are under the same ownership, the establishment of an access easement is no longer required. However, whenever possible, easements should be established to protect the shared approach from future changes in property ownership.
Restrict Turning Movements at Approaches	
	The number of conflict points on the highway introduced by a particular approach can be significantly reduced by restricting turn movements, such as allowing only right-in and right-out movements, allowing only right-in movements, or prohibiting only left-out movements (as shown in graphic). Such restrictions are commonly applied through the construction of median barriers or "pork chop" islands in the approach throat. In some cases where physical limitations do not allow for the construction of barriers or islands, restrictions can be conveyed through signing alone. However, when only signing is present, higher violations rates should be anticipated.
Construct Turn Lanes to separate Turning Vehicles from Through Traffic	
	The provision of turn lanes removes slowing or stopped vehicles attempting to turn off of the highway from faster moving through traffic. This not only provides significant safety benefits, but also enhances system capacity. While nearly all approaches to a highway could benefit from the provision of a turn lane, they are typically only constructed at intersections with public streets or approaches to major trip generators, such as large shopping centers. This is partially due to the cost of constructing the additional roadway and partially a practical matter as the frequent installation of turn lanes may create conflicts or overlaps in the functional area of the lanes. The provision of turn lanes requires the construction of additional roadway, often resulting in highway widening and the need for additional right-of-way. At higher speeds, the required lengths of turn lanes increases, which further increases the impacted area and cost.

Construct Non-traversable Medians

The construction of non-traversable medians is a means of reducing the number of conflict points introduced on a highway by approaches. Non-traversable medians can be simple concrete islands or barriers or can be constructed to include landscaping or other decorated treatments. They can also be used accommodate pedestrian refuges or can have breaks allowing for limited or full turning movements.

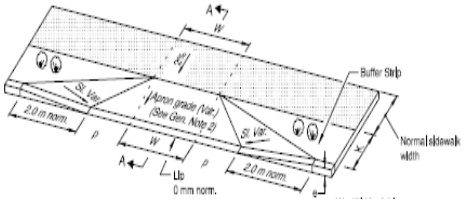
Similar to adding turn lanes, the installation of non-traversable medians often requires highway widening. Also, where non-traversable medians are installed, the width of the median lane may need to be greater than it would be otherwise to provide shy distance between through vehicles and the obstruction in the median.

Provision of Cross-circulation between Developments

When access is provided to allow vehicles to pass between adjacent properties without using the highway, unnecessary conflicts are removed. Vehicles using the highway for cross-circulation between adjacent properties can be particularly hazardous as such drivers often drive the wrong way in travel lanes and utilize very small gaps in traffic because they perceive that they will only be on the highway for a short time.

Similar to the establishment of shared approaches, the provision of cross-circulation requires the establishment of access easements between properties and can therefore be difficult to achieve. Because such arrangements affect site circulation, the requirement for cross-circulation is best applied during design review for new developments.

Improve Approach Design



Poorly designed or constructed approaches can create hazardous conditions on the highway when drivers have difficulty negotiated them or when poor delineation fails to properly guide drivers into the appropriate areas. Also, approaches that are wider than they need to be present unnecessary exposure for pedestrians and bicyclists. Such conditions can be mitigated through reconstruction to a more appropriate design.

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Roadway Design & Capacity

Modernization to meet Design Standards

The modernization of a highway generally refers to upgrading elements to meet current design standards and capacity needs. Outdated highway designs may not be serving present day demands due to insufficient number and width of lanes, poor geometry, or failure to accommodate a particular mode of travel (e.g. no bike lanes).

Modernization of a highway can include many of the tools identified in this memorandum, along with their associated opportunities and constraints. The most common constraint may be need for additional right of way, which may be limited by existing development patterns and sensitive or difficult environmental areas.

Modify Intersection Approach Geometry

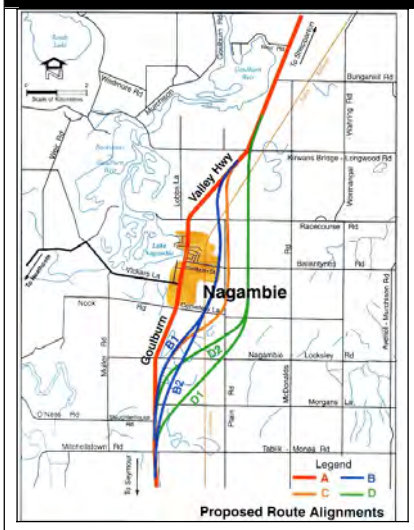
When the configuration of through and turn lanes at intersection approaches does not properly reflect the demand for these movements, the right-of-way at signalized intersections can not be efficiently assigned. Also, poor alignment of opposing lanes or mismatched left turn treatments often require signal phasing that may not be the most effective option for maximizing through capacity. By reconfiguring the number and type of lanes approaching a signalized intersection, significant improvements in capacity can be achieved.

In some cases, needed reconfigurations only require restriping the existing pavement. However, other times, it may require highway widening, purchase of additional right-of-way, or signal modifications.

Turn Lanes

(see Access Management tools)

Construct Alternate Routes



The construction of alternate routes is generally aimed at removing a portion of the highway traffic from a specified area. This could either be done by removing local traffic or short trips with the construction of parallel arterials or collectors within the city, or by removing regional or statewide traffic through the construction of a by-pass.

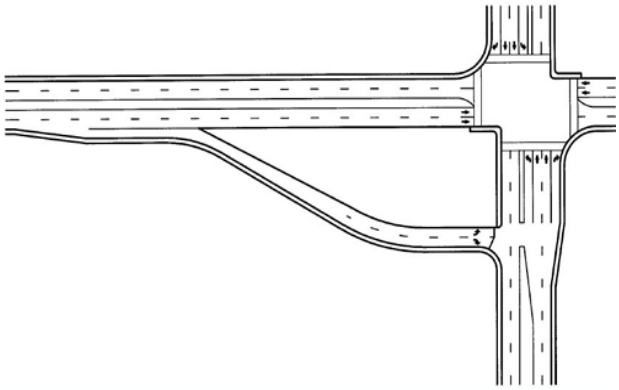
Alternates routes can be very effective, but are often very expensive, require a significant amount of right of way, and may have to negotiate difficult terrain or environmentally sensitive areas. Also, to make these routes attractive for the intended users, careful consideration should be given to the locations of the termini, distance of out-of-direction travel required, accessibility, and preservation of capacity.

Construct Bus Pullouts

(see Transit tools)

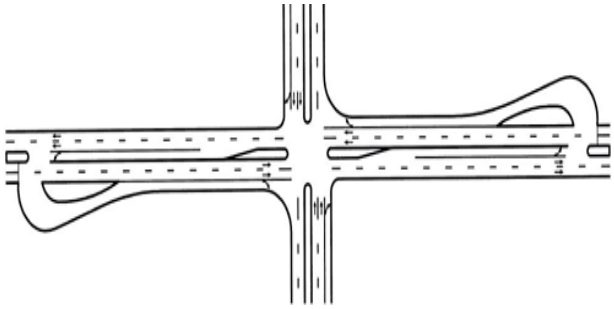
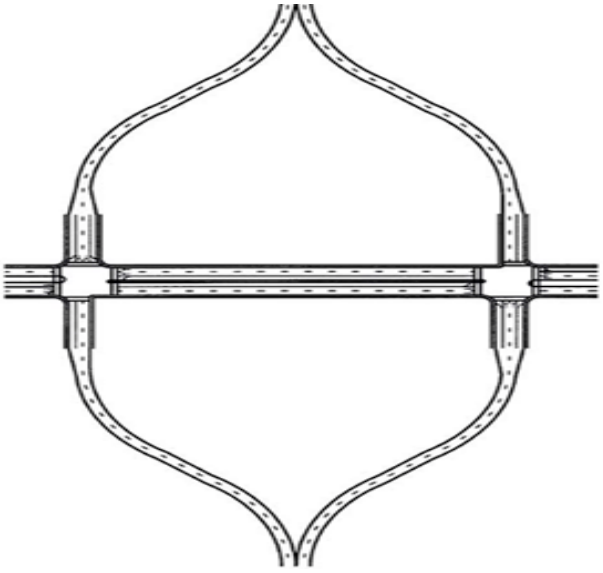
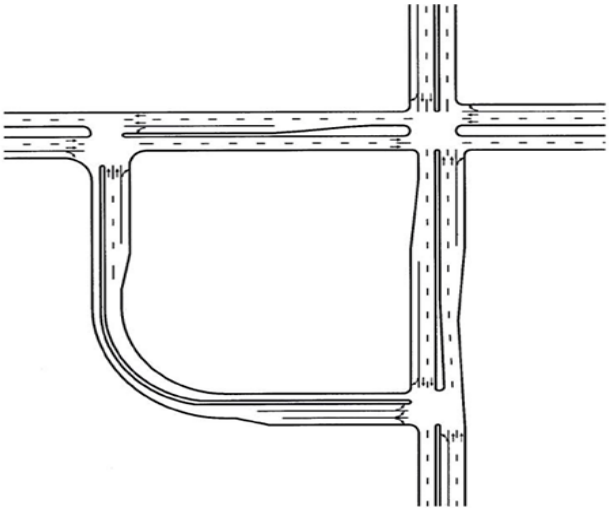
Alternative Left Turn Treatments

Jughandle



Alternative left turn treatments add capacity at signalized intersections by removing left turns and repositioning them as through movements or other non-critical movements through treatments such as jughandles, U-turn crossovers, split intersections, or quadrant roadways (shown in order at left).[1]

While these treatments can improve capacity, they generally require a substantial amount of additional right of way to construct the supporting roadways. Also, the length of vehicle queues plays an important role in the size of design of the roadways and the ability of the treatment to function adequately. Where long queues are present, such treatments

U-turn crossover  Split intersection  Quadrant roadway 	become very costly or ineffective.

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Transportation Systems Management (TSM) & Transportation Demand Management (TDM)

Signal Timing Enhancements

The assignment of right of way to competing movements at an intersection plays a critical role in the overall capacity of that intersection and the highway itself. Old signal timing plans may not be appropriately serving current demands or may not be designed to accommodate fluctuating demands throughout the day or week. Also, timing plans can be created based on specific priorities, such as giving preference to the mainline during peak travel periods. In some situations, signal timing may be adequate, but adjacent signals are not equipped to communicate with each other or are too close together to coordinate properly.

Signal timing enhancements can include modifications to existing signalized intersection configurations or locations, establishment of new priorities upon which to base a new plan, implementation of adaptive timing systems that adjust according to fluctuations in actual demand, or simply updating the established timing.

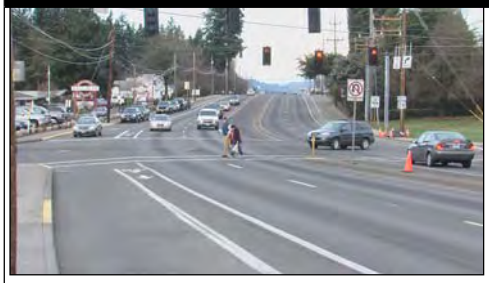
Intelligent Transportation Systems (ITS)

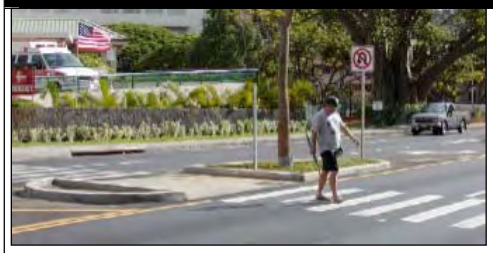
Intelligent Transportation Systems (ITS) come in many forms and have numerous applications. In general, they include any number of ways of collecting and conveying information regarding highway operations to agency staff managing the facility or even to motorists. This can allow both operators and motorists to make informed decisions based on real-time information, leading to quicker responses to incidents, diversion away from congestion, and increased efficiencies in highway operation.

Common ITS applications include: video surveillance, transit signal priority, adaptive signal control, variable speed limits, reversible lanes, dynamic message signs, and highway advisory radio. With most ITS applications, dedicated agency staff must be available to continuously monitor and manage the operation of these devices.

Restriction of Left Turns	
	Because left turn and through movements are often competing for limited right of way, the removal of left turns from an intersection, either completely or during a specific time of day, can significantly improve through traffic capacity. Unless accommodated as part of a larger intersection improvement (see Alternative Left Turn Treatments) or through an adjacent intersection and good off-highway connectivity, the elimination of left turns at an intersection may result in diversions which are undesirable.

Pedestrian

Provision of Crosswalks at Signalized Intersections	
	Provision for pedestrian crossings at signalized intersections offers pedestrians dedicated right of way for crossing a roadway, which in the case of a wide, high-volume, high-speed highway, is often the safest and most preferred means of crossing. On State highways, signalized crosswalks must be installed on all approaches unless an engineering investigation finds they should be omitted. Providing for pedestrians as part of a signalized intersection often reduces the capacity of that intersection for serving motor vehicle traffic and the activation of pedestrian push-buttons may interrupt coordinated traffic flow along a highway. Also, the use of certain lane configurations and signal phasing may not be compatible with pedestrian crossings, either requiring a crosswalk prohibition or modification of the intersection. Also, while commonly the most preferred option for pedestrian crossings, signalized intersection spacing needs are typically much greater than what would be adequate to provide good pedestrian connectivity, requiring unsignalized crossing opportunities as well.

Median Refuge Islands	
	Median refuge islands provide pedestrians and bicyclists the ability to break highway crossings into two separate actions, with each requiring a shorter crossing distance of traffic moving in the same direction. Median refuge island can be placed at intersections or mid-block. However, in both cases, their presence may prohibit the use of the median for turning vehicles. They also act as an obstruction in the roadway and require good visibility and appropriate width in the median for adequate refuge and shy distance to passing vehicles. When paired with a marked crosswalk, the guidance for located marked crosswalks at uncontrolled locations (see below) must be followed as well.
Marked and Unsignalized Crosswalks	
(see above graphic)	Installation of marked crosswalks at locations where traffic is uncontrolled (no signal, stop or yield signs) generally will not improve crossing safety and can actually put the pedestrian at greater risk by implying a level of protection that may not exist. On State highways, an engineering study must be conducted and approved by the State Traffic Engineer prior to installing marked crosswalks at locations where highway traffic is uncontrolled. In general, marked crosswalks at uncontrolled locations should only be considered where: ▪ There is good visibility, ▪ There is no reasonable alternative crossing location, ▪ There is established frequent pedestrian usage, ▪ Posted speeds are 35 mph or less, ▪ Traffic volumes are less than 10,000 a day (if greater, may require a median refuge island), and ▪ On multi-lane facilities, they are accompanied by bulb-outs or median refuges. Mid-block crosswalks are also generally discouraged unless an engineering study, approved by the State Traffic Engineer, finds they are an appropriate treatment. The general criteria for considering a mid-block uncontrolled crosswalk is similar to the criteria above, with the added requirement that they should not be located within 300 feet of the nearest marked crossing.

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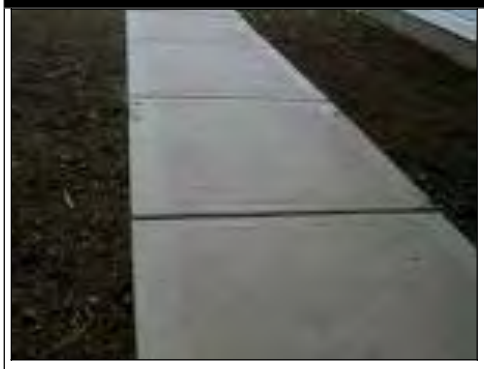
Sidewalk Infill



Gaps in the sidewalk system force pedestrians to walk over uneven or muddy surfaces. Many such gaps are not passable by pedestrians with disabilities. As a result, some pedestrians choose to travel along the side of the roadway or are deterred from walking at all.

Some sidewalk gaps can be easily filled, often as part of property development. However, gaps can sometimes be the result of environmental constraints or difficult terrain.

Construction of Bulb-outs

Bulb-outs are commonly seen on lower speed facilities preceding and following a parallel parking aisle (as shown at left). Bulb-outs facilitate pedestrian crossing by shortening the crossing distance and making waiting pedestrians more visible to drivers by bringing them closer to the travel lanes.

Bulb-outs also have a calming effect on traffic, encouraging slower travel speeds and are not appropriate on higher speed facilities where the placement of obstructions close to the travel lanes would be hazardous.

Also, state statutes prohibit modifications to designated freight routes (such as US 26) that would reduce the vehicle-carrying capacity of the facility, which may preclude such treatments.

Remove Obstructions / Provision of Adequate Walkway Width

Obstructions in walkways typically include sign posts, mailboxes, utility poles, fire hydrants, or trees. In some cases, overgrown vegetation adjacent to the walkway can act as an obstruction as well.

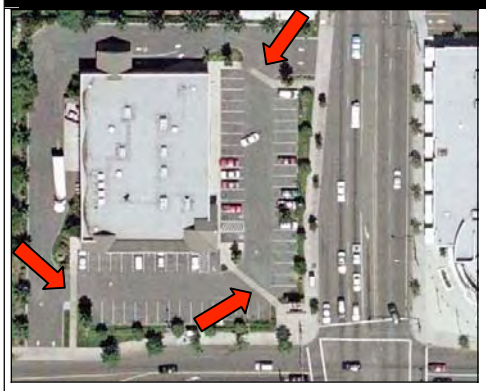
The Americans with Disabilities Act requires a minimum unobstructed width of 4 feet for walkways to make them accessible to all users. However, City standards require minimum sidewalk widths of 5 feet, while ODOT requires at least 6 feet of width.

Provision of Buffers in High-speed Corridors

Curb-adjacent sidewalks along high-speed motor vehicle corridors are generally not attractive or comfortable places for pedestrians to walk. This is often mitigated by providing a small buffer between pedestrians and highway traffic, often through the installation of a landscape strip.

Landscape strips require additional right of way, but can be as narrow as four feet wide. Also, care should be taken when selecting vegetation for the strips to ensure they are compliant with policies of the agency of jurisdiction.

Direct Pedestrian Connections between Streets and Developments



Pedestrians should be provided direct connections from public walkways to front doors of area developments to limit out-of-direction travel and reduce conflicts between pedestrians and motor vehicles in parking areas.

Such improvements should be accommodated for during the design review stage of new development proposals.

Bicycle

Modernization to meet Design Standards

According to the 1995 Oregon Bicycle and Pedestrian Plan, bicycle lanes should be 5 to 6 feet wide, while the recommended width for bicycle shoulders is 6 feet, with a minimum of 4 feet allowed where physical limitations are present. However, when adjacent to a curb, guardrail, or other roadside barrier, a minimum bicycle shoulder width of 5 feet must be used.

The most common means of obtaining adequate bicycle facilities is to widen the highway, often as part of a project to upgrade the highway to meet current design standards. In some cases, where excess paved area is available, it may be possible to restripe the existing highway.

Transit

Provision of additional Amenities at Bus Stops

Provision of passenger amenities at bus stops creates a more pleasant and attractive environment for bus riders and may encourage people to use the transit system. Provision of amenities generally depends on anticipated patronage levels and available funding. Common amenities include: shelters, benches, trash cans, and bus route information.

A standard size bus shelter requires a 7' x 9.5' pad. Shelters should be placed at least 2 feet from the curb when facing away from the street and at least 4 feet away when facing toward it. The adjacent sidewalk must still have a 5-foot clear passage. Orientation of the shelter should consider prevailing winter winds.

Construct Bus Pullouts (also see Roadway Design & Capacity tools)

Bus pullouts allow transit vehicles to pick up and drop off passengers in an area outside the traveled way and are generally provided on high-volume and/ or high-speed roadways. They are frequently constructed at bus stops with a high number of passenger boardings such as large shopping centers, office buildings, and factories.

By removing stopped buses from travel lanes, delays to highway traffic are considerably reduced and safety is enhanced by removing an obstruction from the traveled way. They also help better define bus stop locations, can be used for bus layovers, and create a more relaxed environment for loading and unloading.

However, the construction of bus pullouts requires some highway widening, which may also require acquisition of additional right-of-way. The use of pullouts can also make it more difficult for buses to reenter traffic, which impacts operation times and reliability for users.

The design of bus pullouts should allow for motor vehicles and bicycles to freely pass by without obstruction. Also, they should generally be constructed on the far side of signalized intersections so the signal can create gaps for buses to use to reenter traffic (see below).

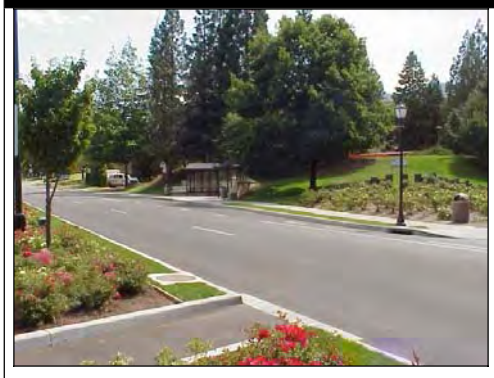
Move Bus Stops to Far Side of Signalized Intersections

On multi-lane streets or streets with wide shoulders where motor vehicles may pass uncontrolled around a stopped bus, bus stops located on the far side of intersections are preferred to provide needed sight distance. At signalized intersections, bus stops may be located on either the near side or far side of the intersection. However, in locations where bus pullouts are desired, far-side stops should be used.

In general, far-side bus stops are desired because they reduce conflicts with right turning vehicles, encourage pedestrians to cross behind the bus, minimize the area needed for curbside bus zones, make it easier for buses to reenter traffic at signalized intersections, and have fewer impacts on roadway capacity. However, far-side stops also require passengers to access the bus further from the crosswalks, may interfere with right turns from the side street, and where pullouts are not used, can result in blockages of an intersection.

Streetscape Design

Landscaping



Landscaping in one of the most common and visually appealing aspects of a streetscape. It is closely associated with a planned pedestrian environment and multimodal travel choices such as walking, biking or boarding public transit. When abundantly included in the right-of-way within urban areas, it reduces the visual scale and impact of a multi-lane highway, reinforces pedestrian areas and provides the comfort of shade and pavement cooling.

As a part of a community's "green infrastructure" landscaping in sidewalks and medians contributes to the reduction of air and water pollutants. It reduces the overall lessening of impervious surfaces that have dramatically altered our rivers and urban watersheds.

Gateways

Gateways are roadside portals. They create highly visible drive-through entries and landmarks for a community built around a highway. They can be an important marker for the transitional zones on highways become community streets. Gateways help signify the change from "highwayscape" to streetscape.

Gateways are also an opportunity to express community identity and themes, as well as the beginning of the pedestrian environment associated with urban land uses.

Construction of Bulb-outs

Where on-street parking is allowed, curb bulb-outs are an opportunity to capture a small piece of roadway space and convert it to pedestrian space without diminishing roadway functions. These bulb-outs make pedestrians waiting to cross the street more visible to motorists and then shortens the walking distance.

Bulb-outs are also an opportunity for additional streetscape landscaping and for visually appealing furnishings such as decorative bollards and ornamental street lights.

Street Furnishings

Streetscape furnishings are finishing touches for "place-making". They create a human scale not found in the highway environment outside our urban growth areas. Furnishings selected for a complementary style also provide a thematic consistency for our urban areas. Complementary style might include texture, color, form and plant materials. Even public art can help furnish the street.

On-Street Parking

As a highway approaches a downtown core, vehicle speeds tend to slow significantly. Commercial and retail land uses change to smaller buildings and a greater variety of business types. Providing on-street parking can be an important community function of the highway. On-street parking also reinforces the pedestrian buffer from moving vehicles and can have an additional traffic calming effect.

Sidewalk Design

Sidewalks are the border area between roadway and land use. That border is the primary pedestrian environment of the streetscape and the "front door" into many businesses. As pedestrian facility it is best to regard the pedestrians as a "design vehicle", just as we would the automobile and the freight truck.

Good sidewalk design includes attention to common functional zones:

- Furnishing Zone T rees, lights, bike racks, vendors, bus stops, etc.
- Pedestrian Zone Safe and unobstructed walking space for multiple pedestrians at once, including those with vision or mobility impairments.
- Building Front Zone When buildings have little or no setback form the sidewalk, this zone provides space for window shopping, outdoor seating or displays and the common movements in and out of storefront doors.

[1] Pictures from "A Review of Signalized Intersections: Informational Guide", Federal Highway Administration Publication No. FHWA-HRT-04-092, Retrieved from website on May 23, 2007: http://www.tfhrc.gov/safety/pubs/04092/index.htm

Appendix D - Streetscape Elements Cost Estimates

US 26 Sandy Gateway Plan

SUMMARY

Total Project Costs

Item	Cost Estimate
Gateways	
West Gateway	$315,000
West Vista Loop	$182,000
East Vista Loop	$146,000
Typical Sections: Cost per 100 Feet	
70 MPH Design Speed	$34,000
55 MPH Design Speed	$31,000
45 MPH Design Speed	$28,000
30 MPH Design Speed	$23,000
Special Conditions: Cost per 100 Feet	
1A - Sidewalk Below Road Grade	$27,000
1B- Sidewalk Above Road Grade	$27,000
2A - Steep Slope with Buffered Sidewalk	$51,000
2B - Steep Slope with Curb-Tight Sidewalk	$51,000
2C - Steep Slope with Swale	$50,000
Median: Cost per 100 Feet	
Median Curb, Gutter and Landscaping	$10,800
Corridor Totals	
East Corridor Total	$8,100,000
West Corridor Total	$8,200,000

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

East Corridor Total

Item	LF	Unit Measure	Qty	Sides of Street	Unit Cost	Total Cost
Prototypical 70 MPH Design Speed (E. Vista Loop to Lauzon La)	1,153	100 LF	12	2	$34,000	$816,000
Prototypical 70 MPH Design Speed (Northside -27+86 to W. Vista Lp	1,334	100 LF	13	1	$34,000	$442,000
Prototypical 70 MPH Design Speed (W. Vista Loop to E Vista Loop)	2,642	100 LF	26	1	$34,000	$884,000
Prototypical 45 MPH Design Speed (Langensand to Sta. 27+86)	1,167	100 LF	12	1	$28,000	$336,000
Prototypical 45 MPH Design Speed	1,244	100 LF	12	2	$28,000	$672,000
Prototypical 35 MPH Design Speed	385	100 LF	4	2	$23,000	$184,000
Special Condition 1 (Walkway Below Grade - W. Vista Loop to E. Vista Loop)	2,642	100 LF	26	1	$27,000	$702,000
Special Condition 2 (Steep Slope (Langensand to Sta. 27+86)	1,167	100 LF	12	1	$51,000	$612,000
Special Condition 2 (Southside - 27+86 to W. Vista Loop)	1,334	100 LF	13	1	$51,000	$663,000
East Vista Loop Gateway		EA	1	na	$108,000	$108,000
West Vista Loop Gateway		EA	1	na	$135,000	$135,000
Landscaped Median (Sta 3+30 to Sta 12+93)	825	100 LF	8	na	$11,000	$88,000
Landscaped Median (Sta 48+40 to SE)	970	100 LF	10	na	$11,000	$110,000
Traffic Separator (Proctor to Sta 3+30)	125	100 LF	1	na	$150	$150
Traffic Separator (Dubarko to Sta 48+40)	800	100 LF	8	na	$150	$1,200
Traffic Separator (Begins at Vista Loop Dr E)	780	100 LF	8	na	$150	$1,200
					TOTAL CONSTRUCTION COSTS	**$5,754,550**
Preliminary Engineering (15%)						$863,000
Environmental Permitting (5%)						$288,000
Construction Engineering (20%)						$1,151,000
					TOTAL PROJECT COSTS	**$8,057,000**

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

West Corridor Total

Item	LF	Unit Measure	Qty	Sides of Street	Unit Cost	Total Cost
Prototypical 70 MPH Des Spd (Orient to speed change)	1,376	100 LF	14	2	$34,000	$952,000
Prototypical 55 MPH Des Spd (Speed change to 362nd)	1,987	100 LF	20	2	$31,000	$1,240,000
Prototypical 55 MPH Des Spd (362nd to just past Industrial)	2,004	100 LF	20	1	$31,000	$620,000
Prototypical 55 MPH Des Spd (Just past Industrial to Speed Change)	373	100 LF	4	2	$31,000	$248,000
Prototypical 45 MPH Des Spd (Speed chg to near Reuben)	658	100 LF	7	2	$28,000	$392,000
Prototypical 45 MPH Des Spd (Near Reuben to Univ.)	1,712	100 LF	17	1	$28,000	$476,000
Prototypical 45 MPH Des Spd (Univ. to Speed Chg.)	800	100 LF	8	2	$28,000	$448,000
Prototypical 35 MPH Des Spd	320	100 LF	3	1	$23,000	$69,000
Spec. Cond. 1 (Walkway Below Grade-362nd to just past Industrial)	2,004	100 LF	20	1	$27,000	$540,000
Spec. Cond. 1 (Walkway Below Grade-Near Reuben to Univ.)	1,712	100 LF	17	1	$27,000	$459,000
Spec. Cond. 2 (Steep Slope)	0	100 LF	0	0	$51,000	$0
West Gateway		EA	1	na	$233,000	$233,000
Landscaped Median (Orient to just beyond Champion)	1,112	100 LF	11	na	$10,800	$118,800
Landscaped Median (Near Royal)	110	100 LF	1	na	$10,800	$10,800
Landscaped Median (Sta 728+15)	170	100 LF	2	na	$10,800	$21,600
Landscaped Median (Sta 747+68)	170	100 LF	2	na	$10,800	$21,600
Landscaped Median (Univ. Ave)	70	100 LF	1	na	$10,800	$10,800
Traffic Separator (Champion to 362nd Ext)	750	100 LF	8	na	$150	$1,200
Traffic Separator (362nd Ext to Sta 716+08))	880	100 LF	9	na	$150	$1,350
Traffic Separator (Sta 716+08 to Industrial Way)	510	100 LF	5	na	$150	$750
Traffic Separator (Industrial Way to 728+15)	500	100 LF	5	na	$150	$750
					TOTAL CONSTRUCTION COSTS	**$5,865,000**
Preliminary Engineering (15%)						$880,000
Environmental Permitting (5%)						$293,000
Construction Engineering (20%)						$1,173,000
					TOTAL PROJECT COSTS	**$8,211,000**

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

Typical Section - 70 MPH Design Speed

Item	Qty in 100' one side	Unit Measure	Unit Cost	Total Cost
Clearing & Demolition	1	LS	$1,900	$1,900
Curb & Gutter	100	LF	$10	$1,000
Sidewalk	67	SY	$38	$2,533
Street Lighting Allowance	1	EA	$8,000	$8,000
Street Trees	3	EA	$350	$1,050
Planter Strip	600	SF	$5	$3,000
Buffer Planting (Clear Zone)	1,600	SF	$5	$8,000
	CONSTRUCTION SUBTOTAL PER 100 FEET			**$25,483**
Mobilization (5% of Construction Subtotal)				**$1,274**
Contingency (30% of Construction Subtotal)				**$7,645**
	TOTAL CONSTRUCTION COSTS			**$34,403**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$5,160
Environmental Permitting (0%)				$0
Construction Engineering (20%)				$6,881
	TOTAL PROJECT COSTS			**$46,443**

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

Typical Section - 55 MPH Design Speed

Item	Qty in 100' one side	Unit Measure	Unit Cost	Total Cost
Clearing and Demolition	1	LS	$1,700	$1,700
Curb & Gutter	100	LF	$10	$1,000
Sidewalk	67	SY	$38	$2,533
Street Lighting Allowance	1	EA	$8,000	$8,000
Street Trees	3	EA	$350	$1,050
Planter Strip	600	SF	$5	$3,000
Buffer Planting (Clear Zone)	1,200	SF	$5	$6,000
	CONSTRUCTION SUBTOTAL PER 100 FEET			**$23,283**
Mobilization (5% of Construction Subtotal)				**$1,164**
Contingencies (30% of Construction Subtotal)				**$6,985**
	TOTAL CONSTRUCTION COSTS			**$31,433**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$4,715
Environmental Permitting (0%)				$0
Construction Engineering (20%)				$6,287
	TOTAL PROJECT COSTS			**$42,434**

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

Typical Section - 45 MPH Design Speed

Item	Qty in 100' one side	Unit Measure	Unit Cost	Total Cost
Clearing and Demolition	1	LS	$1,400	$1,400
Curb & Gutter	100	LF	$10	$1,000
Sidewalk	67	SY	$38	$2,533
Street Lighting Allowance	1	EA	$8,000	$8,000
Street Trees	3	EA	$350	$1,050
Planter Strip	600	SF	$5	$3,000
Buffer Planting (Clear Zone)	800	SF	$5	$4,000
	CONSTRUCTION SUBTOTAL PER 100 FEET			**$20,983**
Mobilization (5% of Construction Subtotal)				**$1,049**
Contingency (30% of Construction Subtotal)				**$6,295**
	TOTAL CONSTRUCTION COSTS			**$28,328**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$4,249
Environmental Permitting (0%)				$0
Construction Engineering (20%)				$5,666
	TOTAL PROJECT COSTS			**$38,242**

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

Typical Section - 30 MPH Design Speed

Item	Qty in 100' one side	Unit Measure	Unit Cost	Total Cost
Clearing and Demolition	1	LS	$1,300	$1,300
Curb & Gutter	100	LF	$10	$1,000
Sidewalk	67	SY	$38	$2,533
Street Lighting Allowance	1	EA	$8,000	$8,000
Street Trees	3	EA	$350	$1,050
Planter Strip	600	SF	$5	$3,000
		CONSTRUCTION SUBTOTAL PER 100 FEET		**$16,883**
Mobilization (5% of Construction Subtotal)				**$844**
Contingencies (30% of Construction Subtotal)				**$5,065**
		TOTAL CONSTRUCTION COSTS		**$22,793**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$3,419
Environmental Permitting (0%)				$0
Construction Engineering (20%)				$4,559
		TOTAL PROJECT COSTS		**$30,770**

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

Special Condition 1a - Sidewalk Below Grade

Item	Qty in 100' one side	Unit Measure	Unit Cost	Total Cost
Clearing and Demolition	1	LS	$1,300	$2,900
Earthwork Allowance	1	LS	$1,000	$1,000
Curb & Gutter	100	LF	$10	$1,000
Sidewalk	67	SY	$38	$2,533
Street Lighting Allowance	1	EA	$8,000	$8,000
Tree Allowance	3	EA	$350	$1,050
Planter Strip	600	SF	$5	$3,000
Grass Seeding	1,600	SF	$0.50	$800
	CONSTRUCTION SUBTOTAL PER 100 FEET			**$20,283**
Mobilization (5% of Construction Subtotal				**$1,014**
Contingencies (30% of Construction Subtotal)				**$6,085**
	TOTAL CONSTRUCTION COSTS			**$27,383**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$4,107
Environmental Permitting (0%)				$0
Construction Engineering (20%)				$5,477
	TOTAL PROJECT COSTS			**$36,966**

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

Special Condition 1b - Sidewalk Above Grade

Item	Qty in 100' one side	Unit Measure	Unit Cost	Total Cost
Clearing and Demolition	1	LS	$1,300	$2,900
Earthwork Allowance	1	LS	$1,000	$1,000
Curb & Gutter	100	LF	$10	$1,000
Sidewalk	67	SY	$38	$2,533
Street Lighting Allowance	1	EA	$8,000	$8,000
Tree Allowance	3	EA	$350	$1,050
Planter Strip	600	SF	$5	$3,000
Grass Seeding	1,600	SF	$0.50	$800
	CONSTRUCTION SUBTOTAL PER 100 FEET			**$20,283**
Mobilization (5% of Construction Subtotal				**$1,014**
Contingencies (30% of Construction Subtotal)				**$6,085**
	TOTAL CONSTRUCTION COSTS			**$27,383**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$4,107
Environmental Permitting (0%)				$0
Construction Engineering (20%)				$5,477
	TOTAL PROJECT COSTS			**$36,966**

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

Condition 2A - Steep Slope with Buffered Sidewalk

Item	Qty in 100' both sides	Unit Measure	Unit Cost	Total Cost
Clearing and Demolition	1	LS	$1,300	$1,300
Earthwork Allowance	1	LS	$2,000	$2,000
Retaining Wall	400	SF	$38	$15,200
Handrail Allowance	100	LF	$60	$6,000
Curb & Gutter	100	LF	$10	$1,000
Sidewalk	67	SY	$38	$2,533
Street Lighting Allowance	1	EA	$8,000	$8,000
Tree Allowance	3	EA	$350	$1,050
Grass Seeding	1,200	SF	$0.50	$600
	CONSTRUCTION SUBTOTAL PER 100 FEET			**$37,683**
Mobilization (5% of Construction Subtotal)				**$1,884**
Contingencies (30% of Construction Subtotal)				**$11,305**
	TOTAL CONSTRUCTION COSTS			**$50,873**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$7,631
Environmental Permitting (5%)				$2,544
Construction Engineering (20%)				$10,175
	TOTAL PROJECT COSTS			**$71,222**

Note: All costs are in 2007 dollars.

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Special Condition 2B - Steep Slope with Curb-Tight Sidewalk

Item	Qty in 100' one side	Unit Measure	Unit Cost	Total Cost
Clearing and Demolition	1	LS	$1,300	$1,300
Earthwork Allowance	1	LS	$2,000	$2,000
Retaining Wall	400	SF	$38	$15,200
Handrail Allowance	100	LF	$60	$6,000
Curb & Gutter	100	LF	$10	$1,000
Sidewalk	67	SY	$38	$2,533
Street Lighting Allowance	1	EA	$8,000	$8,000
Tree Allowance	3	EA	$350	$1,050
Grass Seeding	1,200	SF	$0.50	$600
	CONSTRUCTION SUBTOTAL PER 100 FEET			**$37,683**
Mobilization (5% of Construction Subtotal)				**$1,884**
Contingencies (30% of Construction Subtotal)				**$11,305**
	TOTAL CONSTRUCTION COSTS			**$50,873**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$7,631
Environmental Permitting (5%)				$2,544
Construction Engineering (20%)				$10,175
	TOTAL PROJECT COSTS			**$71,222**

Note: All costs are in 2007 dollars.

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Special Condition 2C - Steep Slope with Swale

Item	Qty in 100' one side	Unit Measure	Unit Cost	Total Cost
Clearing and Demolition	1	LS	$1,300	$1,300
Earthwork Allowance	1	LS	$2,000	$2,000
Retaining Wall	400	SF	$38	$15,200
Handrail Allowance	100	LF	$60	$6,000
Curb & Gutter	100	LF	$10	$1,000
Sidewalk	67	SY	$38	$2,533
Street Lighting	1	EA	$8,000	$8,000
Tree Allowance	3	EA	$350	$1,050
Grass Seeding	600	SF	$0.50	$300
		CONSTRUCTION SUBTOTAL PER 100 FEET		**$37,383**
Mobilization (5% of Construction Subtotal)				**$1,869**
Contingencies (30% of Construction Subtotal)				**$11,215**
		TOTAL CONSTRUCTION COSTS		**$50,468**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$7,570
Environmental Permitting (5%)				$2,523
Construction Engineering (20%)				$10,094
		TOTAL PROJECT COSTS		**$70,655**

Note: All costs are in 2007 dollars.

US 26 Sandy Gateway Plan

West Gateway

Item	Qty	Unit Measure	Unit Cost	Total Cost
Clearing and Demolition	1	LS	$5,900	$5,900
Tree Allowance	2	EA	$350	$700
Entry Sign	1	LS	$10,000	$10,000
Exit Sign	1	LS	$10,000	$10,000
Columnar Basalt - SE Corner - 12'-15'	4	EA	$3,000	$12,000
Columnar Basalt - T-Bone - 24" max height	3	EA	$880	$2,640
Columnar Basalt - SW Corner behind ROW 24" max height	6	EA	$3,000	$18,000
Basalt Boulders North Side 24" max height	5	EA	$880	$4,400
Special Paving Treatment-Median	2,066	SF	$10	$20,660
Special Paving Treatment-North Side	2,034	SF	$10	$20,340
Street Frontage Allowance	2	100 LF	$34,000	$68,000
		CONSTRUCTION SUBTOTAL PER 100 FEET		**$172,640**
Mobilization (5% of Construction Subtotal)				**$8,632**
Contingencies (30% of Construction Subtotal)				**$51,792**
		TOTAL CONSTRUCTION COSTS		**$233,064**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$34,960
Environmental Permitting (0%)				$0
Construction Engineering (20%)				$46,613
		TOTAL PROJECT COSTS		**$314,636**

US 26 Sandy Gateway Plan

Gateway at West Vista Loop

Item	Qty	Unit Measure	Unit Cost	Total Cost
Clearing & Demolition	1	LS	$7,500	$7,500
Sidewalk Connector	44	SY	$38	$1,672
Tree Allowance	21	EA	$350	$7,350
Columnar Basalt Boulders 24" Max. height	5	EA	$880	$4,400
Basalt Columns 10' - 15'	8	EA	$3,000	$24,000
Understory Planting	11,000	SF	$5	$55,000
Street Frontage Allowance	0	100 LF	$34,403	$0
			CONSTRUCTION SUBTOTAL PER 100 FEET	**$99,922**
Mobilization (5% of Construction Subtotal)				**$4,996**
Contingencies (30% of Total Construction Costs)				**$29,977**
			TOTAL CONSTRUCTION COSTS	**$134,895**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$20,234
Environmental Permitting (0%)				$0
Construction Engineering (20%)				$26,979
			TOTAL PROJECT COSTS	**$182,108**

Note: All costs are in 2007 dollars.

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Gateway at East Vista Loop

Item	Qty	Unit Measure	Unit Cost	Total Cost
Clearing & Demolition	1	LS	$4,800	$4,800
Basalt Columns 10' - 13'	10	EA	$3,000	$30,000
Basalt Boulders 24" Max. Height	25	EA	$880	$22,000
Tree Allowance	8	EA	$350	$2,800
Understory Planting	3,827	SF	$5	$19,135
Grass Seeding	2986	SF	$0.50	$1,493
Street Frontage Allowance	0	100 LF	$34,403	$0
		CONSTRUCTION SUBTOTAL PER 100 FEET		**$80,228**
Mobilization (5% of Construction Subtotal)				**$4,011**
Contingencies (30% of Total Construction Costs)				**$24,068**
		TOTAL CONSTRUCTION COSTS		**$108,308**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$16,246
Environmental Permitting (0%)				$0
Construction Engineering (20%)				$21,662
		TOTAL PROJECT COSTS		**$146,216**

Basalt Column Breakdown
4 @ 10' above ground
4 @ 8' above ground
2 @ 6' above ground
10 @ 24" above ground, 1' to 2' diameter
15 @ 24" above ground, 2' to 4' diameter

Note: All costs are in 2007 dollars.

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Median

Item	Qty	Unit Measure	Unit Cost	Total Cost
Curb & Gutter	200	LF	$10	$2,000
Median Planting	1,200	SF	$5	$6,000
		CONSTRUCTION SUBTOTAL PER 100 FEET		**$8,000**
Mobilization (5% of Construction Subtotal)				**$400**
Contingencies (30% of Total Construction Costs)				**$2,400**
		TOTAL CONSTRUCTION COSTS		**$10,800**
Other Estimated Project Costs				
Preliminary Engineering (15%)				$1,620
Environmental Permitting (5%)				$540
Construction Engineering (20%)				$2,160
		TOTAL PROJECT COSTS		**$15,120**

Note: All costs are in 2007 dollars.