Contents

Executive Summary........................................................................................................ 1
Introduction.................................................................................................................... 5
Planning Process........................................................................................................... 13
Land Use & Urban Design............................................................................................ 17
Transportation Facilities............................................................................................... 31
Parks, Schools, Open Space & Trails............................................................................ 49
Other Infrastructure....................................................................................................... 59
Zoning, Design, and Development Standards............................................................. 73
Action Plan & Implementation Strategy....................................................................... 79
Appendices.................................................................................................................... 83

A. Planning and Design Principles
B. Existing Conditions Report
C. Park and School Location Memo
D. Transportation Improvement Tables
E. South Hillsboro Focus Area Plan
List of Figures

TO BE COMPLETED IN FINAL DRAFT

List of Tables

TO BE COMPLETED IN FINAL DRAFT
TO BE COMPLETED IN FINAL DRAFT
This page intentionally left blank.
Introduction
This page intentionally left blank.
The South Hillsboro (SoHi) Master Plan brings together 20 years of conceptual planning to provide a specific framework for future development of this unique Hillsboro community. The SoHi Master Plan will build on previous planning efforts led by the City of Hillsboro and two major SoHi property owners to achieve the following:

- Articulate the city’s vision for development and design of the SoHi community using Planning and Design Principles and identification of Best Practices
- Incorporate property owners’ visions into the city’s Master Plan where consistent and compatible
- Establish recommended road alignments, bicycle and pedestrian corridors, parks and open space, school locations and land use designations/zoning
- Provide regulatory guidance and process clarity to enable property owners to create detailed development plans
- Provide flexibility to encourage creative approaches to development, both public and private
- Provide cost estimates and identify funding tools and strategies for the infrastructure improvements needed to develop SoHi
- Identify expected phasing of public improvements
- Describe a comprehensive implementation strategy that includes detailed design and development standards that will apply to the SoHi planning area.

The Master Plan will be approved by City Council by resolution. The Master Plan will include a list of specific proposed amendments to a number of implementing documents, including the following:

- South Hillsboro Community Plan
- Hillsboro Comprehensive Plan (policies)
- Hillsboro Transportation System Plan
- Hillsboro Water and Sewer Master Plans
- Hillsboro Parks and Recreation Plan
- Hillsboro Development Code
- System Development Charge methodologies for water, sewer, stormwater, parks and transportation, as needed

More information about this topic is found in the Implementation chapter of this Master Plan.
FIGURE 1: SOUTH HILLSBORO MASTER PLAN AREA

NEXT DRAFT WILL PROVIDE UPDATED MAP WITH MORE CONTEXT
SoHi Master Plan Area

The SoHi Master Plan Area (Plan Area) is located at the southeastern edge of the City of Hillsboro (see Figure 1). It lies to the west of SE 209th Avenue and to the south of SW Tualatin Valley Highway. The Plan Area contains approximately 1,400 acres of developed and undeveloped land. Gordon and Butternut Creeks traverse the area from west to east. A Bonneville Power Administration (BPA) power line corridor crosses the Plan Area from north to south. The Plan Area is adjacent to the Reedville, Hazeldale, Aloha, and Witch Hazel Village neighborhoods.

Previous and Concurrent Planning Efforts

Planning for the SoHi area began in the late 1990s, and resulted in adoption of the South Hillsboro Community Plan in 2012. The Community Plan was the first step in establishing a set of goals and objectives for the future growth of the Plan Area and described a development program that emphasized a “complete, connected and green” approach. The Community Plan provided a solid visionary framework and was the starting point for the SoHi Master Plan process.

Concurrent with this Master Plan process, the city is overseeing an Economic, Social, Environmental and Energy (ESEE) analysis of the South Hillsboro planning area. This analysis will determine how and where natural resource protection will be applied through the city’s Significant Natural Resource Overlay Zone. The city completed an amendment to its Transportation System Plan (TSP) for the South Hillsboro area in September, 2013. A Transportation Financing Plan and other public infrastructure analyses and cost estimates are being prepared alongside this Master Plan project.

In addition, a number of individual property owners within the SoHi planning area are currently preparing their own plans for future development. In particular, project partners Newland Communities and Joe Hanauer are working with their own teams to prepare relatively detailed plans for their properties (Reed’s Crossing and Butternut Creek). Specific elements of those plans have been blended into this Master Plan.
Key Planning Issues

*Major road alignments.* A major component to the Master Plan is the evaluation and determination of appropriate alignments for major roads through the SoHi Plan Area, particularly Cornelius Pass Road and its location relative to the Town Center. The Master Plan process considered a number of alternative road alignments that were evaluated by the consultant team, property owner groups, and other stakeholders in order to create the recommended alignment presented in this Master Plan.

*Land use configurations.* Concurrent with development of road alignments, the Master Plan process evaluated land use and development configurations that complement road alignments and meet other project objectives. This included assessment of size and location for the Town and Neighborhood Centers, location of different residential neighborhood types and commercial/retail nodes, and the location and configuration of parks and open space networks within SoHi. The process also included determination of appropriate locations for schools within the Plan Area.

*Housing opportunities.* A key element of the Master Plan is the evaluation and establishment of specific mixes and types of residential uses in the Plan Area that will best achieve the housing objectives and community vision for SoHi. This includes consideration of how those housing types/mixes will relate to the planned Town Center and Neighborhood Center, as well as parks and open spaces.

*Infrastructure & Phasing.* Another key aspect to guiding successful development of the SoHi Plan Area will be ensuring adequate and appropriate stormwater management. The Master Plan process created a general approach to stormwater management that includes: on-site management strategies using low-impact practices; neighborhood and regional detention ponds or swales; and piped conveyances where the other techniques are not possible. In addition, the City recognizes that future developers and residents will create individual neighborhoods with their own unique identities. The Master Plan and related development code will provide the means and flexibility to do this.

*Creating a unique community.* An overall goal of the Master Plan process is to create a distinct area in South Hillsboro that emphasizes sustainable, high-quality development that offers a mix of residential, commercial, and employment uses. This goal is reflected in the Planning and Design Principles, which strive for a “complete, connected and green” community. Those underlying principles have been used throughout the Master Plan process to shape all elements of the plan.

In addition, the City recognizes that future developers and residents will create individual neighborhoods with their own unique identities. The Master Plan and related development code provisions will provide the means and flexibility to achieve this.
Butternut Creek Natural Area

Tualatin Valley Highway and Rail Line

Remnants of Rural Character

Bonneville Power Administration (BPA) Corridor
Planning Process
The SoHi Master Plan process involved multiple components which are briefly summarized below.

- **Project reconnaissance.** Drawing on previous work done for the South Hillsboro Community Plan, one of the first steps in the Master Plan process was to gain a comprehensive understanding of the current regulatory, land use, market, transportation, and infrastructure conditions in the SoHi Plan Area. This information was summarized in the *South Hillsboro Master Plan Summary Report: Existing Conditions, Opportunities and Constraints*, which was completed in August 2013 (see Appendix B).

- **Community engagement.** Early in the Master Plan process, a public involvement plan was developed in order to ensure a broad level of participation by all interested stakeholders and the larger Hillsboro community. Targeted participants included property owners in South Hillsboro; residents and business owners in surrounding neighborhoods; Hillsboro staff, Planning Commission and City Council; and other jurisdictions and public agencies. Participation in the planning process was advertised and encouraged through a variety of methods including a project website, social media, newspapers, work sessions and community meetings/open houses.

- **Coordination and collaboration with partners.** The consultant team and city staff worked closely with project partners throughout the Master Plan process to ensure multiple opportunities for input on project deliverables. Project partners included representatives of two major property owners in SoHi (Hanauer and Newland); owners of property in other parts of SoHi; a Technical Advisory Committee; and service providers including the Hillsboro Parks Department, the Hillsboro School District, Clean Water Services and others. Many of the key project issues (for example, determining the location and design of major roads, parks and schools) were addressed through a collaborative approach with project partners.

- **Planning principles.** Another preliminary step in the Master Plan process was development of *Project Planning and Design Principles* (see Appendix A) and a set of related Best Practices, which were used to guide creation of the land use, transportation, and other scenarios in the Master Plan. These principles were also used to evaluate certain plan alternatives (location of roads, parks, etc.) and to draft the implementing code language. The principles focus on a number of elements, including:
  - Roads and pathways
  - Parks, open spaces and community facilities
  - Housing
  - Commercial and retail development
  - General urban form and design

An overview of the project schedule and key deliverables is shown in Figure 2 on the following page.
FIGURE 2: PROJECT SCHEDULE & KEY DELIVERABLES

This graphic will be updated in a subsequent draft to reflect proposed changes to the overall project schedule.
FIGURE 3: URBAN FRAMEWORK
Overall Land Use Framework

The SoHi land use plan is derived from the general land uses and street alignments that were proposed in the 2007 Community Plan. Much of the form of that plan was driven by the alignment of a major new southward extension of the Cornelius Pass arterial from its existing terminus at Tualatin Valley Highway. This arterial is expected to become a spine of the community, with highest densities located along its route. New collector roads were generally aligned to extend existing streets west across the study area, connecting SW 209th and SW 229th Avenues.

Two major landowners, Newland Communities and Joe Hanauer (Hagg Lane LLC), have developed more detailed plans for their holdings under the general framework of the Community Plan. Their plans are included in the Master Plan shown on page x. Each developer’s consultants have prepared useful analyses of likely development form that are also reproduced in this plan. The plans prepared by Hagg Lane also include properties owned by other individuals to the east and west.

The other properties in the study area will be rezoned as they are annexed and traffic capacity is available. Some areas may be assembled into larger parcels for development. For the purposes of this Master Plan, Community Plan land use designations are applied to those parcels as a placeholder.

A grid of streets, connecting to the grid seen in Newland and Hanauer holdings, has been applied to parcels south of Hanauer between Newland and Hanauer and west of SW 229th Avenue, to indicate the need for local street connections between these two areas. It is assumed that the detailed street system will change according to landowners’ individual plans and PUD submittals, but this plan seeks to confirm alignments of major collectors. As such, local streets are not intended to be fixed.

These collectors include the SW 229th Avenue realignment to connect to SW 234th Avenue (Century Boulevard north of Tualatin Valley Highway) and routes following the key drainages across the site. Connections to Hanauer and Newland streets are also key components of ensuring that this becomes an integrated community rather than a collection of unrelated

Planning Principles: Land Use

- Highlight views to Mt. Hood and other key natural resources such as surrounding foothills, forests and creek corridors.
- Design areas on the edge of SoHi (adjacent to rural areas) to incorporate practices that create a transition between urban and rural development.
- Incorporate a sense of entry into the design of key locations and distinct neighborhoods within the SoHi community through the use of signage, gateway structures, street design, landscaping and building form.
- Incorporate way-finding and contextual elements to provide a sense of location for travelers and establish distinctions between different neighborhoods and centers in SoHi.
- Create a plan that is financially feasible to achieve and economically sustainable over the long term.
- Site commercial and mixed-use buildings to provide a sense of enclosure along the street frontage.
Good streets have a sense of enclosure, an active street frontage, and create a “third place” (apart from homes and public spaces) where people can gather.

Context-sensitive development (views of surrounding landscape; garages tucked behind residences)

Areas of low density development adjacent to rural land create a transition from urban to rural.

Sustainable design - stormwater planters filter runoff and create a pleasant transition from public to private space. Ecoroofs help to filter stormwater runoff, and should be incorporated in building design whenever possible.

Sustainable design - permeable parking surfaces.
subdivisions. Connections between different neighborhoods and to natural areas, green spaces (parks and trails), and other parts of the city are also crucial.

There are three other key drivers of the land use plan’s form:

1. A 250' wide BPA transmission line easement runs north-south across the site, which is currently farmed. It does not represent a barrier to movement across the study area, but development is not permitted within the easement, and adjacent landowners will be concerned about potential health effects (perceived or real) and how these impact residential sales. The corridor may see a doubling of transmission capacity in future. The easement effectively creates a swath of open land from Tualatin Valley Highway to SW Farmington Road, intersecting all three major drainages across the site. A major regional trail, the BN Powerline Trail, is envisioned for the Corridor. The Hanauer development interest at SoHi has indicated an intention to locate neighborhood parks adjacent to the transmission line in their plans.

2. A short line freight railroad corridor runs alongside Tualatin Valley Highway, currently in active use by the Portland and Western Railroad. Due to operational and safety restrictions, at-grade access across railroad tracks is increasingly limited. The existing at-grade crossing at SW 229th Avenue will be closed, leaving just three connections to the Tualatin Valley Highway from the overall SoHi area (including the connection at SW 209th Avenue). This will funnel most traffic to either Cornelius Pass Road, SW 209th Avenue, or to a third access outside the SoHi area, at SW 234th Avenue via SE Alexander Street. This will reduce the potential for a fully connected grid system of streets connecting to the Tualatin Valley Highway, while also resulting in the need for significant intersection improvements at these points.

3. The natural features of this area are another key influence on urban form. These features are entirely related to three major drainages that flow from east to west across the site, draining the land to the Tualatin River, and include riparian corridors, associated wetlands, and adjacent upland wooded habitat.
Land Use Plan

The highest intensity of development is anticipated to occur in the northern portion of the area, in Reed’s Crossing. This will include a Town Center slated for retail, office, and multi-family uses. The Town Center is envisioned as a walkable district focused on the intersection of two ‘Main Streets’, visible from Cornelius Pass Road. Buildings and streets will have a high quality design, and parking will be placed behind the buildings to ensure direct frontage onto the Main Streets and an orientation to the pedestrian. The design of Cornelius Pass Road and other streets in the Town Center -- including the relationship of buildings to the street and the design and location of pedestrian and bicycle facilities -- is the key to ensuring a vibrant, walkable, attractive, and economically viable Town Center. Alternative designs for Cornelius Pass Road are still under consideration and will be refined as the Master Planning process moves forward. Other blocks in the Newland parcel will feature a range of residential densities from Low to High Density, as noted in the land use plan (Figure 4).

The Hanauer landholdings propose a range of densities similar to Newland. This is based on consistent findings in market studies and similar development intentions of providing a mix of retail, commercial and residential uses, along with parks, schools and other community amenities. A Village Center is proposed in the Hanauer parcel along Cornelius Pass Road. This is a smaller-scale mixed use ‘node’ with a pocket park perpendicular to Cornelius Pass. Ground-floor retail uses will face the park. A school and Community Park to the west will further activate this Neighborhood Center. Residential density is highest in the Center and lessens in a concentric pattern moving away from its core. Development along the east edge of the study area should generally reflect the character and density of existing development along SW 209th Avenue, particularly newer subdivisions at densities approaching 10 du/acre.

The southern portion of the SoHi area is currently a mix of agricultural uses and large lot subdivisions along SW 209th Avenue. Land uses in this area will likely be almost entirely residential, although the very southeast corner of the study area, at the intersection of SW 209th Avenue and SW Farmington Road could attract retail uses due to the amount of passing vehicles. The properties to the northwest of the study area are somewhat isolated from the rest of SoHi, but development will be facilitated with a proposed new connection from 234th Avenue/Century Boulevard to 229th Avenue and a realignment of SW 229th Avenue through these parcels. A simple grid of streets will be imposed over the mainly flat ground due north of the Reserve GC. A forested drainage near Gordon Creek, north and west of the Rosedale Elementary School, may make development more constrained in that corner of SoHi.

Schools are often important amenities for new residential development, and this plan provides opportunities for integration of schools with communities, allowing children to walk to school and providing community gathering spaces. A Middle/Elementary School site is reserved on the SE corner of the Newland parcel. There are two existing schools in the study area: Rosedale Elementary School on SW 229th Avenue and the private Life Christian Elementary School on SW 209th Avenue, south of Hagg Lane.
FIGURE 4: COMPOSITE LAND USE PLAN
Best Practices: Housing

Low-density housing at the edge of rural land should be compatible with adjacent rural character and provide views of nearby agricultural fields.

High-quality construction and materials create a character of place. Higher densities achieved through subtle home design types (image shows a duplex).

New development should match adjacent density as well as possible and engage the street with porches where possible, tucking garages behind homes at the rear of lots. Small open area between residential developments creates a sense of shared space.

Residential development with high-quality, context-sensitive design and materials, with particular attention to the “first 30 feet”, or area of the building elevation closest to the street level.

A higher-density development creates openness and encourages community with shared courtyard space.
Potential South Hillsboro Housing
(Excerpt from Newland Communities Draft Plan)

### Planning Principles: Housing

1. **Overall development density should be compatible with surrounding planned density and residential diversity should be promoted.**

2. **All residential areas should allow for opportunities for a variety of housing types and a range of densities appropriate to the goals of each zoning designation and that meet the needs of people in a range of household incomes and structures.**

3. **Individual neighborhoods should allow for a range of architectural styles and design characters.**

4. **Environmentally sustainable approaches should be incorporated in the design and construction of housing, such as building orientation, energy-efficient construction, water-efficient fixtures, photovoltaic panels, recycled and regional materials, water-efficient landscape, minimized site disturbance and/or other similar techniques.**

5. **Residential neighborhoods should be designed for openness.  Gated communities and tall, sight-obscuring fences and walls should be avoided except for screening mechanical systems and back of house services such as trash collection areas.**
Ranges of Density
TEXT ABOUT HOUSING TO BE ADDED IN LATER DRAFT
Best Practices: Commercial Development

Large-scale retail presence successfully maintains inviting street presence for pedestrians; off-street parking hidden

Street enclosure; wide sidewalks for ease of occupancy

Street trees and on-street parking create a protected, walkable street front

Businesses present an inviting and lively commercial “face” to a roadway

A green and protected pedestrian walkway provided through a parking lot

A pedestrian-friendly grocery store in a mixed-use environment
Planning Principles: Commercial

- Development along Tualatin Valley Highway and the railroad should help create an attractive and inviting “face” and sense of entry to South Hillsboro by establishing buildings that are visually open and minimize blank walls. Parking and loading areas should be significantly screened from adjacent pedestrian facilities.

- Retail and commercial buildings should be constructed of high quality materials. Standards for use of materials on the ground floor of retail, commercial and other buildings, including in mixed use areas is particularly important. Special attention should be paid to the first 30 vertical feet of the buildings to ensure a pleasant and inviting presence for the pedestrian.

- Site buildings so that they provide active street frontages that support walking, with minimal setbacks. Building heights should be sufficient to create a sense of street enclosure, or ‘outdoor room.’

- Site parking and loading services should be located so as to allow desired uses and activities to face the street and to support pedestrian-oriented streets. The majority of parking and loading areas will be located on the side or rear of buildings. Direct, safe and convenient pedestrian access through parking areas should be integrated into site design and layout.

- Ground floor retail and commercial buildings and uses shall have a high degree of transparency, with glass windows or doors occupying a majority of the ground floor façade and allowing pedestrians to see inside the building.

- Upper stories also should incorporate a large degree of window openings and other features that provide visual interest and are compatible in scale and character with nearby neighborhoods.

- Ensure that large scale retail does not detract from the heart of the town center.

- Signage should be pedestrian-oriented in scale and location and should not contribute to a sense of visual clutter.

- Civic, retail, residential and other uses should be sited and designed such that they are visually complementary to each other. Locate larger-scale commercial uses in town centers only. Neighborhood commercial uses should be of smaller scale, oriented to pedestrian access from nearby homes.
This page intentionally left blank.
Transportation Facilities
A variety of transportation facilities will ultimately help people travel within SoHi, as well as to and from places outside the Plan Area. This Plan describes the location and design of major transportation facilities in SoHi – i.e., large (“arterial” and “collector”) streets, such as Cornelius Pass Road, Alexander/Blanton Street, 229th Avenue, Rosedale Road, and others. It also provides standards for the design of these and other facilities, describes approximately when different roads or other transportation facilities are expected to be built, and describes how the transportation system will serve and connect to key destinations within SoHi. Finally, it addresses a full range of modes of travel -- individual vehicles, bicycling, use of transit, and walking.

Planning Principles: Transportation

- To the greatest extent possible, create a road system that ensures safety and maximizes connectivity within South Hillsboro as a whole and within individual neighborhoods and developments. This road system should generally include a grid of major arterials, collector, and local streets and alleyways designed to respond to a full range of development types and transportation functions. In some areas, the ability to create a grid system may be affected by topography, natural resource constraints or other limiting factors.

- Roadways should include facilities for walking and bicycling as appropriate based on roadway classification and context. A network of inner-connected pedestrian and bicycling routes should be provided that are inviting, safe and encourage use.

- Development along arterials (209th Avenue and Cornelius Pass Road) should have limited access with the number of driveways minimized and a limited number of intersecting roads, to effectively meet the transportation needs of the planning area while providing adequate capacity for surrounding traffic needs and connecting to surrounding streets and neighborhoods. Access to individual businesses and properties should be from secondary streets wherever possible.

- Streets in mixed use and commercial areas should incorporate pedestrian-oriented designs and amenities such as wide sidewalks and highly visible crosswalks, medians or refuges, on-street parking, pedestrian scale lighting, street trees and furniture, opportunities for outdoor seating and/or other features intended to activate and energize streetscapes. On-street parking should be included in street design, where appropriate, to support commercial and retail uses fronting on the street.
Best Practices: Transportation

Street trees provide shade, protection, and character to the street.

Grid system of streets with bike lanes and on-street parking -- a “complete street”, integrated with building edges and activities.

Comfortable, safe, and open/integrated pathways for bikes and pedestrians can connect neighborhoods with major streets.

Wide pathways connect residential development to other areas.

Bioswales not only treat stormwater, but also provide a pleasant edge to residential streets and give a neighborhood distinctive character.

Wide shared greenway trails for bike and pedestrian access to and through natural areas.

(Image from Low Impact Development Handbook, University of Arkansas)
**Location and Design of Major Roads and Other Facilities**

Figure 5 shows the location of major roads in SoHi. These locations are preliminary and will be further refined, both in subsequent drafts of the Master Plan and during future, more detailed design and development processes. Wherever possible, roads will be located and designed to minimize impacts on existing properties and structures, as well as to reduce impacts on streams, creeks and other natural resources. Figure 5 includes the following types of facilities:

- **Arterial streets.** These roads will carry the most significant amount of traffic within the area, including traffic that starts or ends in SoHi, as well as traffic destined for other parts of Hillsboro or the region. Cornelius Pass Road and 229th Avenue are the only arterials in SoHi. Ultimately, these will be the largest roads in the area. They will tend to provide less direct access to adjacent properties, since driveways and intersecting roads must be spaced farther apart on arterial streets. These roads will typically include five or seven travel lanes (including turn lanes), with additional turn lanes at intersections in some cases, as well as sidewalks and bicycle lanes. Illustrations of the design of these roads are found on page 42.

- **Collector streets.** These streets “collect” traffic from local neighborhood streets, and people will typically use them to travel between neighborhoods in SoHi or to access an arterial street. These will include Alexander/Blanton Street, Rosa Road, Rosedale Road, and a variety of other roads that have yet to be named, all shown in Figure 5. These roads will typically include three travel lanes (including turn lanes) as well as sidewalks and bicycle lanes. Illustrations of the design of these roads are found on page 41.

- **Neighborhood Routes.** These streets are similar to collectors but are intended to carry less traffic and primarily serve individual neighborhoods. They provide direct access to people’s homes and businesses, as well as routes through neighborhoods to local destinations. They typically include two travel lanes, bicycle lanes on the sides, parking on one side and sidewalks and planting strips on both sides of the street. Illustrations of the design of these roads are found on page 40. Several possible neighborhood routes are shown in Figure 5.

- **Local Streets.** For the most part, the locations of local streets are not defined in this Master Plan, but will be defined as part of future specific development proposals. Local streets provide direct access to individual homes and businesses. They typically include enough room for on-street parking, travel in both directions, planting strips, and sidewalks. Bicycles generally share the travel lanes with cars on these streets. Illustrations of the design of these roads are found on page 40.

- **Trails and pathways should be designed and built to safely accommodate a variety of users and provide connections between homes, local and regional destinations, including retail and shopping areas, schools, parks, natural and open spaces and other community facilities.**

- **Major streets such as Cornelius Pass Road should be connected to adjacent neighborhoods as much as possible. These streets should act as part of the neighborhoods rather than barriers. Sound walls should be avoided.**
FIGURE 5: PROPOSED ROAD SYSTEM
• **Alleys.** Alleys can provide access to residents of neighborhoods, limiting the negative impacts to streetscape from garages dominating front facades. Alleys can be used for commercial deliveries in mixed use or commercial areas. They can also be used to route some utilities, which can help to eliminate unsightly meter boxes on front lawns. Alleys would typically be allowed and encouraged but not required in these areas. Illustrations of the design of alleys are found on page 41.

### Other Transportation Design Issues

In designing and building future roads in SoHi, the City and developers or property owners will need to consider the following:

• **Street trees, lighting, furniture and other amenities.** Most streets will include planting strips with street trees or other vegetation. Trees or other plantings provide a number of benefits, including shade, beauty, cleaner air, and stormwater management. However, they must be carefully chosen to ensure that streets can be maintained in a cost-effective manner and that trees or plantings don’t block people’s vision, damage streets or sidewalks, or result in significant cleanup or maintenance costs. Street lights are used to ensure safety at night for drivers, bicyclists, and pedestrians, as well as to enhance the appearance of neighborhoods and sometimes provide a unifying design feature for different areas. In areas where many people will walk or shop, such as the SoHi Town Center and Village Center, benches, trash receptacles, and other amenities will enhance people’s traveling, shopping, and living experiences.
FIGURE 6: BICYCLE & PEDESTRIAN TRAILS PLAN
**Shopping and other commercial and mixed use areas.** Streets in mixed-use and commercial areas will incorporate pedestrian-oriented designs and amenities such as wide sidewalks and highly visible crosswalks with Rapid Flashing Beacons or pedestrian signals at high demand locations, medians or refuges, on-street parking, pedestrian scale lighting, street trees and furniture, opportunities for outdoor seating, and/or other features intended to activate and energize streetscapes. On-street parking should be included in street design, where appropriate, to support commercial and retail uses fronting on the street.

**Drainage swales.** In areas where soils drain well, drainage swales may be integrated with the design of streets to help better manage stormwater. This will save the cost of building expensive pipes in these roadways, help filter stormwater before it enters the ground and underlying aquifers, and reduce the impacts on streams and other waterways in the area. Examples of potential designs for these types of streets are illustrated on page 65.

**Transit Service.** Providing transit service to SoHi residents and visitors will be essential to providing people with a full range of transportation choices. Specific transit routes and frequency of service will be formulated as development occurs. Preliminary recommendations including providing service to a transit center to be developed in the Town Center area, with service originating from Tualatin Valley Highway. Ultimately, transit will occur along major roads in the area, including Cornelius Pass, SW Century/229th Avenue, Alexander/Blanton Street, and others. The timing and character of service will depend on the pace and character of development and resulting projected ridership, among other factors.

**Bicycle and Pedestrian System**

As a “Complete Connected Green” community, it is vitally important that the transportation system in SoHi provides a variety of choices for people to walk and bicycle within the area both for exercise and to travel from their homes or businesses to places to shop, eat, drink, recreate or learn. Figure 6 illustrates proposed bicycle and pedestrian facilities within SoHi which will include:

- **Bicycle lanes.** Federal law and good planning practice dictates that bicycle lanes be provided on all collector and arterial streets, as shown in Figure 6.

- **Sidewalks.** All new roads will include sidewalks on both sides of the street to ensure that people can walk within and between different neighborhoods and directly access homes and businesses.

- **Additional multi-use paths and trails.** Pathways are planned for several locations to provide additional opportunities for people to bicycle and walk within SoHi, including along the BPA powerline corridor, along Butternut and Gordon Creeks, parallel to and south of Tualatin Valley Highway, across Butternut Creek (to supplement limited road crossings of the creek) and interspersed through residential areas to provide connections between homes, parks, schools, and other activity centers.
Mixed Use Retail Street

Mixed Use Residential Street

Neighborhood/Local Street Section
Arterial Cross Sections

CORNELIUS PASS NORTH SECTION

CORNELIUS PASS SOUTH SECTION
Neighborhood Street System

Every residential neighborhood will have a well-connected system of streets and pathways to ensure that people can drive, walk or bicycle within and between neighborhoods safely and directly. These systems will include small blocks, sidewalks on all new streets and additional bicycle or pedestrian pathways where road connections aren’t feasible. Typical neighborhood street patterns are illustrated on pages 25 and 26.

Integration with Other Elements

The transportation system will be integrated with other aspects of SoHi in the following ways.

- **Buildings.** Transportation facilities are designed to be integrated with and serve the residents, workers and visitors who are using them. The fronts of homes and businesses should be oriented to and directly accessible to adjacent sidewalks and streets, with easy, direct access to them. In commercial or mixed use areas, particularly where people shop, buildings should be located relatively close to the street to provide a sense of enclosure and comfortable access for pedestrians.

- **Trail systems and links.** As shown in Figure 6, a number of multi-use trails and pathways are proposed in SoHi. These pathways would be linked to the road system at crossing points, with additional connection points via neighborhood streets, school and park facilities.

- **Parks and schools.** Parks and schools will typically have access to at least one collector street, as well as local neighborhood streets. Where parks and schools are co-located, they may be separated by a local neighborhood street but should not be separated by
a busier (collector or arterial) road. In general, the edges of parks should be next to streets, rather than backing up directly to people’s yards or homes as shown in Figure __. As noted previously and shown in Figure __, schools and parks also will be connected to key trails and pathways either though direct pathway connections or the local street system.

- **Stormwater and other infrastructure facilities.** In portions of SoHi where soils drain well, stormwater management facilities (e.g., drainage swales or larger “ponds”) will be located either within the roadway (e.g., in a center median or interspersed between the sidewalk and road). In other areas they may be located between a pathway and stream corridor or wetland area.

**Traffic Analysis**

The draft master plan land use and resulting traffic demands are consistent with the South Hillsboro Community plan and as a result the traffic analysis completed in the South Hillsboro Focus Area Plan in Appendix XX) provides an understanding of anticipated traffic operations. As the master plan is refined the traffic operation results in the Focus Area Plan will be updated where appropriate.

**Timing of Construction and Interim Design**

South Hillsboro will be built out over a long period of time through multiple phases. The phases of development must be equitable -- the infrastructure must be able to support the development of a given phase, and the revenue generated by the development of a given phase must be adequate to fund the construction of the infrastructure. The Draft Master Plan has identified five potential phases of development based on the capacity of intersections with Tualatin Valley Highway to move traffic in and out of South Hillsboro.

- **Phase 1:** (Year 2015) Add protected northbound left-turn phase at intersection of Tualatin Valley Highway and 209th Avenue to facilitate South Hillsboro development served primarily by 209th Avenue. Planning for these improvements is currently underway.

- **Phase 2:** (2017) Extend Cornelius Pass Road south to Alexander/Blanton Street and construct Alexander/Blanton street between 209th and 229th Avenues. This will support development in the northern portion of South Hillsboro (North of Butternut Creek) including the proposed Town Center and areas north of the golf course, as well as some portions of Butternut Creek.
FIGURE 7: POTENTIAL PHASING
• **Phase 3**: (2018) Assumes the Rock Creek bridge has been completed (as an MSTIP project), north of South Hillsboro to complete a north/south connection of Century Boulevard and 231st Avenue and provide relief for nearby north/south roadways like Cornelius Pass Road and Brookwood Parkway. Century Boulevard is also widened approaching Tualatin Valley Highway in this phase to provide additional capacity across Tualatin Valley Highway and facilitate additional development served by Century Boulevard/229th Avenue.

• **Phase 4**: (2020) This phase assumes the completion of the Kinnaman Road extension from 209th Avenue to a completed Century/229th realignment and the extension Cornelius Pass Road south to (but not across) Butternut Creek. The additional transportation infrastructure facilitates any remaining development north of Butternut creek and allows additional development south of Butternut Creek served by 209th and 229th Avenues. This phase also include an off-site alignment of Kinnaman Road at 198th Avenue that is funded by South Hillsboro.

• **Phase 5**: (2025) This phase completes the transportation infrastructure for South Hillsboro to allow development of any remaining parcels. The most significant transportation project completed in this phase is the extension of Cornelius Pass Road south to Rosedale Road, including an MSTIP funded bridge across Butternut Creek. This phase also include an off-site improvements that are funded by South Hillsboro at 198th and 185th Avenue intersections with Tualatin Valley Highway, and widening of 198th Avenue from Tualatin Valley Highway to Alexander/Blanton Street.

Figure 7 shows the general area of development assumed for each phase. Table X1 provides a summary of the trip capacity of each phase.

In the same fashion that South Hillsboro is likely to be developed by area, individual transportation projects are likely to be developed in phases of capacity. Figure X shows how the individual improvements at intersections on Tualatin Valley Highway need to be phased to meet agency volume to capacity (v/c) ratio standard of 0.99 and provide the vehicle trip capacity of each phase identified in Table X1.

The specifics of how other transportation improvements off of Tualatin Valley Highway are phased are not identified in the Draft Master Plan. For new arterial and collector roadways and intersections, the general approach will be to initially provide a basic roadway cross-section to facilitate initial development -- likely a two lane cross-section for collectors and a three lane cross-section for arterials. The initial phases of these roadways may include basic bicycle and pedestrian facilities consisting of curbs with sidewalks in areas with some urban/suburban existing development or a gravel shoulder in areas with very rural existing conditions. As development occurs on the frontage of these new roads, developers will be required to bring their frontage up to the build-out requirement of that roadway or intersection.

There are some key areas where this phased approach is not appropriate and roadways or intersections should be built to their ultimate cross-section to support a multimodal environment and/or to provide a visual focal point for key community areas in South Hillsboro, such as the Town Center,
Neighborhood Center, community park and Transit Center.

As a regionally important arterial, Cornelius Pass Road is a unique roadway within South Hillsboro that not only will need to be built to a five lane cross-section to support South Hillsboro build out over the next 20 plus years, but will also need to be designed and built to accommodate the long-term need for a potential seven lane cross-section that may be needed if additional Urban Reserve areas in Washington County are brought into the Urban Growth Boundary and developed.

### On- and Off-Site Improvements

As summarized below, in addition to needed improvements within SoHi, a number of infrastructure improvements will be needed outside the SoHi Plan Area to support build-out of the South Hillsboro Community Plan Area.

#### Projects Within South Hillsboro

Table X shows recommended Base Case mitigation projects that are needed to meet operational standards within the South Hillsboro Community Plan Area. [See appendix, Table X: Recommended Base Case Mitigation Projects]

#### Projects Outside South Hillsboro Planning Area

Table x shows recommended mitigation projects that are needed to meet operational standards with build-out development outside the Planning Area (See appendix, Table x: South Hillsboro Plan Transportation Improvements). They include the following types of improvements:

- Improve intersections on existing roads, including Tualatin Valley Highway, Cornelius Pass Road, 209th Avenue, Alexander/Blanton Street, Kinnaman Road, and others.
- Widen sections of several existing roads in the vicinity of SoHi, including Century/234th Avenue, 209th Avenue, Farmington Road and Rosedale Road.
- Widen existing roads within the study area, including Rosa Road, Rosedale Road, and 229th Avenue.
- Build new roads within SoHi, including extensions of Cornelius Pass Road, Alexander/Blanton Street, and Kinnaman Road, among others.
This page intentionally left blank.
FIGURE 8: EXISTING PARKS CONTEXT

Disclaimer: This map is intended for informational purposes only. It is not intended for legal, engineering, or surveying purposes. While this map represents the best data available at the time of publication, the City of Hillsboro makes no claims, representations, or warranties as to its accuracy or completeness. Metadata available upon request.
Parks and Open Space Concept

As this area develops into a complete community, there is a great opportunity to reserve space for parks, which can become the heart and focal point of a new neighborhood. Parks are often presented as key amenities for potential homebuyers and have been proven to increase property values for nearby homes.

The City of Hillsboro’s Parks Department has anticipated growth in the SoHi area and identified seven general placeholder sites (six neighborhood parks and one community park) for future parks in the Community Plan, according to a logical dispersal of sites that can serve a wide range of existing and future neighborhoods. There is a rich mix of parks and open spaces north and east of the study area that can also complement new parks by offering a wider variety of spaces, many within walking distance (see Figure 8).

The Parks Department is currently seeking to acquire land for one large (30-acre) Community Park, which will feature a Community Center and sports fields. This Community Park will be located south of Butternut Creek and will ideally be co-located with a school (location options noted on plan). Land will also be sought for at least four Neighborhood Parks, which are intended to serve nearby homes and feature more passive, unprogrammed space. One such park is proposed for the Butternut Creek Village Center, just west of Cornelius Pass Road.

In addition to formally-identified Community and Neighborhood Parks, there are other types of public spaces that can contribute to the livability and identity of SoHi, such as Community Gardens,

---

Relevant Planning Principles

- Natural features and habitat areas should be preserved and incorporated into the design of residential and commercial areas, as well as parks and recreational facilities.
- Parks and open spaces should have public edges (i.e., public streets) adjacent to supportive uses in order to help make them safe. Avoid placing rear yards and fences as borders to parks and open spaces.
- Where feasible and beneficial, schools, civic uses, parks and open space corridors may be co-located and/or directly connected to make them walkable for children, improve safety, reduce the need to drive between these facilities and use land and other resources efficiently.
- Civic uses and parks should have prominent locations to create neighborhood identity and to encourage public use.
- Parks should meet the city’s size standards and include a variety of active and passive recreational and other neighborhood or community-oriented activities and opportunities and meet the needs of surrounding residential and mixed use neighborhoods.
- The design and siting of parks should help enhance the character of surrounding neighborhood and serve as a tool for creating desirable urban form.
- Higher density residential areas and commercial and mixed use areas should incorporate gathering places for residents, workers, shoppers and other visitors. These spaces should be sized and designed to accommodate gatherings and events as appropriate.
- The BPA Easement Corridor should be considered as an amenity and should be adjacent to a public street or other public space with opportunities for linear open space and trail connections where feasible.
Habitat areas adjacent to greenway trail create a scenic, elegant, and safe pathway.

Community garden - a greenspace near housing that serves diverse needs.

Provide open spaces and plazas that can be programmed to accommodate and support a variety of activities.

Play areas should be located within walking distance from schools and homes.

Easily-accessible greenspace for residents to gather.

Natural areas with a public edge.
public plazas in the Town Center, pocket parks or greens within new neighborhoods, and green roofs and courtyards in larger buildings. Some of these open space opportunities are shown on the Newland Plan illustrations on pages 25 and 26.

In addition to parks, there are many opportunities to provide open space in the SoHi area, usually on unbuildable and protected land featuring Goal 5 resources such as riparian areas (Butternut Creek is the most visible example), wetlands, upland habitat and steep slopes (see Figure 10). These spaces can provide future residents with access to nature, both visually, as backdrops to new development, and recreationally, with trails routed adjacent to sensitive areas.

The Best Practices at left provide some images of important elements to consider in the siting and design of parks for SoHi.

**Trails**

A trail network in SoHi can be created out of a range of different trail types, including roadway sidewalks, natural open space trails, and regional connections such as a trail proposed under the BPA transmission line corridor. Trails are an integral part of the transportation network, providing an alternative to auto travel and partially reducing the need for roads in the new community.

Ideally, a system of trails will be created, connecting open spaces together, linking to other parks and open spaces outside the community, and providing safe routes for children to travel to schools as well as for the elderly to get to civic destinations.

**THPRD trail sections shown as precedents. Actual trail will conform to Active Transportation Plan.**

DRAFT Master Plan
FIGURE 9: PARKS AND OPEN SPACE PLAN

[Diagram of South Hillsboro area showing various locations and land uses, including Alternative Site for Community Park, School Site/Existing School, Potential Natural Area, Potential Park/Open Space, Proposed ES (5 acres), Proposed ES (10 acres), Proposed ES/MS (20-25 acres), Proposed ES (7-10 acres), Neighborhood Park (4 acres), Neighborhood Park (2 acres), Conceptual Natural Resource Corridor, Conceptual Neighborhood Park (General Location), Proposed Trails, Proposed Roads with Pedestrian and Bicycle Improvements, and other features.]

LEGEND
- Potential Park/Open Space
- Potential Natural Area
- School Site/Existing School
- Proposed Trails
- Proposed Roads with Pedestrian and Bicycle Improvements

[Location of detail on facing page]
The plan above is a demonstration of how one of several alternatives for a proposed Community Park site in the Butternut Creek area could be configured to provide an optimal arrangement of recreational spaces, parking and circulation. Ideal site conditions include:

- A site of approximately 30 acres
- Infrastructure for restrooms and for potential recreation center (shown)
- Flat or gently rolling topography
- Good access from adjacent collector streets
- Walkable from nearby residential neighborhoods
- Adjacency to an Elementary or Middle School site to take advantage of co-location benefits such as shared parking, maintenance and programming.
- In the case above, nearby natural areas to the north and south provide an additional visual amenity and potential trail linkages to the Community Park.
Location of Parks and Schools

One key element to consider in the siting of Schools and Parks is to remember that they can play an important role in creating neighborhood identity. Parks should be centrally-located and easy to access, especially on foot, and should be set aside early in the planning process in places that often include natural amenities such as mature trees.

Schools can also serve as important shapers of community identity. Well-designed and sited schools should have a civic presence and an inviting public edge.

Both schools and neighborhood parks generally seek out flat sites that are easy to develop. They also require utility provision, so they should be located to take advantage of existing infrastructure.

A few examples of the benefits and challenges of collocating parks and schools are listed here. For more information, see the Park and School Location Memo (Appendix C).

Benefits

- Efficiencies in land needs and construction cost from sharing facilities such as parking and sports fields that would otherwise need to be exclusively provided.
- Takes advantage of divergent scheduling of each use. Parks are usually busiest nights and weekends, while schools are out of bounds during the day.
- Benefits from sharing operations and maintenance funding and logistics.

Challenges

- Combined facilities may be over-scaled for the context, a sort of ‘campus’ that interrupts a street grid.
- Certain residents will be far away from the combined facility, when if there were two separate facilities, they’d potentially be closer to one of those.
- Basic differences in the design and funding of parks and schools may mean that the two facilities have divergent levels of design quality, which may be made more glaring by close proximity.
- Security measures at schools are a major consideration. As a result, shared facilities often have a burden of additional signage and rules to clearly delineate where community members can and cannot be at certain times.
- Liability insurance may become more expensive for both the School and Parks Districts as a result of offering shared facilities.
FIGURE 10: NATURAL RESOURCES FRAMEWORK

Legend:
- South Hillsboro Boundary
- Upland Wildlife Habitat Class A
- Riparian Wildlife Habitat Class III
- Riparian Wildlife Habitat Class II
- Riparian Wildlife Habitat Class I
- Potential Wetlands
- Significant Riparian Upland
- Significant Wetlands
This page intentionally left blank.
Other Infrastructure
FIGURE 11: EXISTING AND FUTURE WATER SYSTEM

Prepared By: APG, David Evans Associates, Inc.

Disclaimer: This map is intended for informational purposes only. It is not intended for legal, engineering, or surveying purposes. While this map represents the best data available at the time of publication, the City of Hillsboro makes no claims, representations, or warranties as to its accuracy or completeness. Metadata available upon request.
A variety of public infrastructure facilities will be needed in SoHi to provide homes, businesses and others with water and sanitary sewer services and to manage the flow and filtration of stormwater. Police, fire and library facilities also will be needed to serve the area.

**Water Services and Facilities**

Typically, the following types of facilities are needed to provide water to an area:

- Treatment plants to ensure that water is clean and drinkable
- Reservoirs to store treated water and large transmission mains to manage distribution to local areas
- Pipes, pump stations, and pressure regulators to distribute the treated water to local homes and businesses

In SoHi, the only water facilities expected to be needed are the local distribution system—pipes, pump stations, and pressure regulators to distribute treated drinking water within local streets. Treatment and large storage facilities that serve SoHi will be located outside the area. While development in SoHi will help fund the cost of these facilities (to the extent they serve new homes and businesses), they will not be located within the SoHi study boundary. However, a new high pressure water transmission line from a new storage reservoir in the South Cooper Mountain area is likely to be located in the future Cornelius Pass Road extension corridor to deliver water to an existing transmission line north of Tualatin Valley Highway.

**Planning Principles: Other Infrastructure**

- Clarify public and private responsibilities for building and maintaining public facilities, spaces and other infrastructure.
- Plan for undergrounding of all utilities wherever possible.
- Low impact development practices should be incorporated in designing and building streets and pathways, including building narrower streets and using sustainable drainage techniques where feasible and financially sustainable over the long term.
- Stormwater treatment facilities should be seemlesly incorporated into the landscape and design of neighborhoods and civic spaces as much as possible.
- Utilize passive building strategies, including building orientation to maximize daylighting and natural ventilation, to promote sustainability.

In general, the SoHi local distribution pipe network will be located along existing and new roads. These pipes will be installed to form a connected loop that ensures adequate water pressure and flow to all users. Temporary connections to existing Tualatin Valley Water District (TVWD) mains can be made in early stages of SoHi development and reconnected to newly constructed portions of the final loop system as they are developed. In addition to the new major distribution pipes associated with roadways, Figure 11 shows the suggested location of additional facilities such as a booster pump station (BPS), pressure reducing valves (PRV), potential temporary connections to existing Tualatin Valley Water District (TVWD) waterlines, and locations of subsurface storage wells called aquifer storage and recovery (ASR) wells that are owned and operated by TVWD and the Joint Water Commission (JWC).
FIGURE 12: EXISTING AND FUTURE SEWER FACILITIES

Prepared By: APG, David Evans and Associates, Inc.
Date: 11/7/2013

Disclaimer: This map is intended for informational purposes only. It is not intended for legal, engineering, or surveying purposes. While this map represents the best data available at the time of publication, the City of Hillsboro makes no claims, representations, or warranties as to its accuracy or completeness. Metadata available upon request.
Sanitary Sewer Facilities

Sanitary sewage system facilities are needed to collect wastewater generated in the SoHi area, and convey the flow to the Clean Water Services (CWS) River Road Pump Station, which will force the flow to CWS’s Rock Creek Advanced Wastewater Treatment Facility (WWTF) located in Hillsboro but outside of the SoHi study area. CWS owns and operates pump stations and all sanitary sewer lines greater than 21 inches in diameter. CWS cannot construct lines associated with new development. These sanitary sewer main lines located on either side of Butternut Creek, south of the next tributary, and north of Cross Creek, will need to be constructed by developers in order to provide sanitary sewer services to new development. Figure 12 shows one potential layout for the main lines and pump stations. Sanitary sewer mains will need to be constructed along and adjacent to the riparian corridors of existing stream and sensitive areas and convey flows to either the existing sanitary lines or these new pump stations. Smaller sanitary lines will be constructed in streets at the time of development.

Two new pump stations will ultimately be located in SoHi. The Butternut Creek Pump Station is currently in design although the exact site is still being determined. It will collect flow generated south of approximately SW Kinnaman Road and north of approximately SW Murphy Lane. The associated force main route has also not been finalized at this time; the tentative location may be northward along SW 229th Avenue or west directly to SW River Road. CWS plans to have this pump station online by the beginning of 2016.

The Rosedale Pump Station has been identified but not yet included in CWS’s 15-year capital budget plan, as CWS anticipates incorporating it in the latter phase of development. The Pump Station is likely to be located near SW Rosedale Road and SW 229th Avenue. At some future time, CWS will retire the Cross Creek Pump Station on SW 229th Avenue. Sanitary flows of the contributing area from North Cooper Mountain as well as the area south of SW Murphy within the SoHi boundary will be routed to this Rosedale Pump Station, which will force the flow up SW 229th Avenue to merge with the Butternut Creek Pump Station flow.
Stormwater Management Approach and Facilities

Anticipated new federal regulations, to be reflected in future CWS permits, will likely require post-construction controls on storm water such that new development would need to be designed to prevent a significant rise in the peak rate and duration of runoff contributed to streams. CWS will modify its design and construction standards in the next 22 months to reflect this requirement. Therefore, to protect local streams and anticipate and align with future county-wide requirements, it is recommended that the Master Plan adopt this approach as the basis for recommended storm water management.

The South Hillsboro area has varying soils and topography and contains several major riparian corridors. The recommended site and neighborhood development pattern should aim to protect, enhance, and incorporate these riparian corridors and avoid adverse impacts to stream health within and downstream of the study area.

The general approach for storm water management within the South Hillsboro study area strives to minimize impacts from increased stormwater runoff, both in and downstream of the area. This would be achieved by applying a range of tools and strategies: on-site management through low-impact design (e.g., low impact design approach [LIDA] and green streets where soils are suitable or potentially suitable for infiltration) and small-scale detention; neighborhood or regional detention ponds or swales; and piped conveyance where other strategies aren’t sufficient, cost-effective, or feasible. The overall goals are to coordinate all storm water elements to function cohesively, resulting in a system that mimics the existing, natural hydrological conditions of the area to minimize erosion, resultant sedimentation, and detrimental modified flow regimes; integrate storm water treatment into the landscape where possible; and prevent direct impacts to area streams and riparian corridors.

On-Site Management Elements

LIDA reduces the shift of stormwater from natural ground cover to paved or hard surfaces such as homes, roads, and other structures by modifying our standards for what is “conventional” in a development site, thus reducing storm water generation. This includes reducing the impervious footprint as part of site design. Any remaining storm water runoff is contained, treated, and conveyed with the least environmental impact. Other LIDA tools are described below. Efficient design takes this one step further by designing site features with multiple benefits such as stormwater and site shading, safety, tree canopy, or landscaping. Site-specific, designed controls will be necessary to manage changed hydrology, both from private property (site) and from streets and arterials. LIDA encourages techniques such as:

- Infiltration
- Flow-through planters
- Planter/ rain gardens
- Vegetated filter strips
- LIDA swales
- Green roofs
- Porous pavement
Stormwater retention pond integrated with building site

Flow-through stormwater treatment swales enhance a neighborhood streetscape

On-site stormwater treatment strategy for building runoff

Stormwater planters treat runoff from paved surfaces
Where street and site LIDA can be used, it will be encouraged or required. These techniques can also meet landscaping requirements, provide green boulevards, and easily handle small storm volumes, reducing downstream impact. Only 4 percent—a small area in the northeast corner—of the total South Hillsboro study area has good potential for widespread application of infiltration for large storms, while 44 percent can be suitable for some types of LIDA tools under certain conditions (see Figure 13). The primary emphasis for streets, residential areas, and light commercial areas will be flow-through planters, planter/rain gardens, vegetated filter strips, and LIDA swales. Green roofs will be encouraged for institutional uses (e.g., schools) and for the town center and other retail centers. Porous pavement will be encouraged primarily on driveways, privately owned parking areas, or similar low-traffic surfaces.

Low density areas may require relatively few additional quantity controls if site design encourages tree canopy, green streets, rain gardens and other LIDA site features. Moderate-density areas may need small-scale (on-site) detention in addition to LIDA (if applicable). Higher-density areas may require community-scale detention facilities to capture stormwater in order to prevent erosion of existing streams. Placement of high-density areas in the Plan Area may have differing impacts and therefore differing requirements for control in order to provide the same level of downstream protection.

For purposes of estimation, set-asides should be assumed to account for the dedicated footprint for LIDA facilities. While the minimum of 6% is currently the base condition for CWS systems, this value may increase in the future. It will be critical to design improved stormwater management components to the arterial network in South Hillsboro. All future or improved existing roadways must be designed to completely capture and treat roadway runoff and not contribute to downstream erosion. North Bethany concepts for street cross sections developed by Washington County Department of Land Use and Transportation (2009) may be good models for design of roads in South Hillsboro.

**Neighborhood or Regional Ponds or Swales**

The second major tool in managing storm water quantity and quality to protect downstream channels is to site neighborhood or regional ponds or swales in natural locations that intercept stormwater from multiple properties and control the release rate of storm water to the stream to match pre-development rates. While referred to here as “ponds”, it should be noted that many of these facilities would be dry much of the time.

For many years, the standard practice for site stormwater management has been small detention
FIGURE 13: SOILS INFILTRATION SUITABILITY MAP

NRCS Soils Infiltration Suitability

- Suitable
- Potentially suitable
- Not suitable

Streams
Arterials
Streets

Discoim: This map is intended for informational purposes only. It is not intended for legal, engineering, or surveying purposes. While this map represents the best data available at the time of publication, the City of Hillsboro makes no claims, representations, or warranties as to its accuracy or completeness. Metadata available upon request.
ponds associated with individual development projects. CWS recognizes this approach may be suitable for small, single-builder projects within existing urban areas, but it is not a recommended means for handling stormwater from large areas newly added to the Urban Growth Boundary. Larger ponds, serving multiple properties and sited optimally to capture and detain flow from a natural subcatchment and best protect the receiving stream, are the preferred approach. These larger ponds are much less expensive to construct per volume of storm water handled. The total annual maintenance cost for fewer, larger ponds will be significantly less than for numerous, smaller ponds. Incorporating locations into the SoHi plan at this stage optimizes present and future public and private investment and results in the highest level of stream protection at the lowest total cost.

CWS has developed a concept for designing and funding Regional Stormwater Approach Projects (RSAPs), using the North Bethany area as a prototype. This concept is based on adoption (scheduled for late 2013) of a funding mechanism, the Regional Stormwater Management Charge (RSMC), for reimbursement to developers for the construction of these regional ponds or swales. For purposes of this Master Plan, it is assumed that this concept will be used in SoHi. Following the adoption of the plan, with the prioritized and phased list of regional ponds or swales, CWS would develop a unit volume charge to developers for their portion of the total associated stormwater captured and treated by all the regional ponds in SoHi. The charge would provide cost recovery to CWS for land and facility construction cost; conveyance to the pond would not be covered. The anticipated procedure for the RSAPs are that the ponds would need to be constructed and in place prior to development. CWS would then be responsible for maintenance of the ponds or swales.

**Regional Ponds**

Preliminary locations for potential community stormwater management ponds were developed for further evaluation (see Figure 14). The locations and sizing are preliminary and should be refined as development proceeds. The preliminary effort incorporated the following:

- Topography, including the natural drainage basin boundaries
- Roads, existing and proposed (these will further subdivide basins; as final road alignments are confirmed, these locations should be adjusted)
- Soils’ suitability for infiltration (see Figure 10)
- Proposed land use and associated imperviousness

The map shows only those ponds considered regional or neighborhood; other smaller site-scale ponds will be required in areas not shown as upland of these basins. Smaller ponds would be considered site ponds and might not qualify for CWS’s new RSAP concept.

Table 1 shows the basin (served) area (the pink shaded area in Figure 14) and the corresponding approximate pond surface area not including access road and safety buffer (e.g., Pond 1 has a wetted surface area of 1.4 acre).

During the finalization of the Master Plan, more precise locations and associated upland drainage area of each of these (and potentially additional)
FIGURE 14: PROPOSED STORMWATER PONDS MAP
ponds will be finalized to optimize land use, roadways, open space, and conveyance to the streams. Once the locations have been set, the final size (surface area and total volume) of each pond can be estimated. Further refinement of locations and sizes may be possible as part of future development planning but must be consistent with an evaluation of drainage conditions, topography, location of roads, projected development levels and other factors.

**Table 1: Pond and Basin Areas**

<table>
<thead>
<tr>
<th>Pond Number</th>
<th>Basin Area (acres)</th>
<th>Pond Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25.7</td>
<td>1.4</td>
</tr>
<tr>
<td>2</td>
<td>17.1</td>
<td>0.9</td>
</tr>
<tr>
<td>3</td>
<td>29.8</td>
<td>1.7</td>
</tr>
<tr>
<td>4</td>
<td>22.8</td>
<td>1.3</td>
</tr>
<tr>
<td>5</td>
<td>21.9</td>
<td>1.2</td>
</tr>
<tr>
<td>6</td>
<td>39.7</td>
<td>2.2</td>
</tr>
<tr>
<td>7</td>
<td>23.5</td>
<td>1.3</td>
</tr>
<tr>
<td>8</td>
<td>29.5</td>
<td>1.6</td>
</tr>
<tr>
<td>9</td>
<td>31.0</td>
<td>1.7</td>
</tr>
<tr>
<td>10</td>
<td>57.3</td>
<td>3.2</td>
</tr>
<tr>
<td>11</td>
<td>14.9</td>
<td>0.8</td>
</tr>
<tr>
<td>12</td>
<td>37.0</td>
<td>2.1</td>
</tr>
<tr>
<td>13</td>
<td>33.0</td>
<td>1.8</td>
</tr>
<tr>
<td>14</td>
<td>20.9</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**Major Swales**

The reach of Butternut Creek in the undeveloped South Hillsboro area is already stressed by the previous development patterns upstream of SW 209th Avenue. Siltation is occurring between SW 209th and SW 229th Avenues which besides adversely affecting habitat is also potentially contributing to upstream flooding. CWS is concerned that development in South Hillsboro will stress the reach downstream of SW 229th Avenue in a similar fashion. To prevent this, managing stormwater along the creek will be a key concern.

The Butternut Creek linear corridor is an ideal location for a combination roadway, path, and linear stormwater feature along either side of the creek—outside but conceptually integrated with the regulatory vegetated stream corridor. This linear stormwater feature, likely swales connected in series with controlled flow outlets (similar to ponds) to the creek near road or pedestrian creek crossings, would have the same water quality and quantity benefit as a pond, but have the added benefit of providing a natural transition from residential or commercial development and the stream.

**Piped Conveyance**

Piped conveyance will still be needed at several levels. At the local level, inlets, catch basins, and connecting storm sewers will be needed to convey flows in excess of the capacity of the LIDA elements to detain or infiltrate to adjacent open drainageways. Conveyance will also be needed to route flows from the regional ponds or swales to the adjacent streams. Design of local stormwater conveyance will be part of the development design. Design of the pipe system to route flow from the ponds and swales will be part of the pond/swale design process and reflect the design conditions required by the City or CWS.
Other Public Facilities and Services

Other services to provide in SoHi include library, police, fire and emergency response services.

The City of Hillsboro will provide police services in the area. Most services will be managed through the City’s Central police facility, although a community policing office is expected to be located in the SoHi Town Center to provide more direct access to police personnel for SoHi residents and businesses.

The City of Hillsboro plans to open a branch library in SoHi in the Reed’s Crossing area. The library is expected to be approximately 8,000 square foot branch, with a possible future expansion to continue to serve growing population in the area. Given the distance from this location to existing Library branches and the Aloha Library, this will be adequate to serve the area even with the increases in density.

The City of Hillsboro expects to construct a fire station somewhere in the vicinity of Butternut Creek to serve the SoHi area. A variety of factors will drive the timing for constructing the station. Timing will depend on when and how development occurs in SoHi and surrounding areas, the availability of stations and personnel in surrounding areas/stations, and mutual aid agreements with Tualatin Valley Fire & Rescue.
Zoning, Design, and Development Standards
This page intentionally left blank.
Zoning

The South Hillsboro Community Plan identified preliminary Comprehensive Plan land use designations that could be applied within the SoHi community (see Figure 15). In order to implement the SoHi Master Plan and facilitate development, zoning will need to be assigned to all SoHi properties, consistent with the Comprehensive Plan designations. Table XX on the following page provides an overview of the applicable Comprehensive Plan designations and a discussion of the specific Hillsboro base zones that could be assigned to each.

In addition to the base zones, a new South Hillsboro Plan District will be created for adoption into the Hillsboro Zoning Ordinance and then applied to the entire SoHi Plan Area on top of the base zoning. The South Hillsboro Plan District will contain standards and requirements intended to ensure that development in SoHi is consistent with the SoHi Master Plan, the Planning and Design Principles, and the Best Practices that were created for this project. The following is a summary of key elements that will be found in the South Hillsboro Plan District:

- **Variations to permitted uses.** In some cases, the Plan District will either limit or expand the types of uses allowed in that area of SoHi, depending on the underlying base zone. For example, the Plan District may allow more retail and commercial uses in a neighborhood/residential area than would otherwise be permitted by the base zone.

- **Additional design standards.** The Plan District will contain development and design standards that either vary from, or add to, the regular standards in Chapter 17.50 (Development Standards). These additional standards will be specifically designed to implement the Planning and Design Principles and Best Practices that were developed for the SoHi Plan Area and will help ensure consistency with the SoHi Master Plan. Possible examples include: variation to lot size requirements, reduced parking ratios, additional/varied setback standards, additional landscaping standards, and additional standards for sustainable building design.

- **Approval criteria.** The Plan District will likely contain additional approval criteria that would be used to review a Planned Unit Development (PUD) within the SoHi Plan Area. The approval criteria would require that the PUD be consistent with the intent and principles of the SoHi Master Plan and would either reference or include the specific applicable language from the Master Plan. Applicants for a PUD would have to demonstrate how their proposed development would implement and support the overall vision for the future of the SoHi Plan Area.
FIGURE 15: PROPOSED ZONING MAP
### Table XX: Possible Implementing Base Zones for South Hillsboro

<table>
<thead>
<tr>
<th>Community Plan Designation</th>
<th>Target Densities</th>
<th>Possible Implementing Base Zones</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density Residential: Intended for single-family neighborhoods and large lot executive housing with little to no commercial uses.</td>
<td>3-7 units per acre</td>
<td>SFR-10</td>
<td>Would work for &quot;large lot SFR&quot; along golf course</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SFR-8.5</td>
<td>Would work for &quot;large lot SFR&quot; along golf course</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SFR-7</td>
<td>Recommended in Community Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SFR-6</td>
<td>Recommended in Community Plan</td>
</tr>
<tr>
<td>Medium Density Residential: Intended for more compact single-family neighborhoods along major streets and as transition between low density and more intense development.</td>
<td>8-16 units per acre</td>
<td>SFR-4.5</td>
<td>Would work well for the lower end of the medium density range.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MFR-1 (A-1)</td>
<td>Would work well for the higher end of the medium density range.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SCR-LD</td>
<td>Because this zone is intended for Station Communities, it is less likely to be applied in SoHi.</td>
</tr>
<tr>
<td>High Density Residential: Intended for compact residential neighborhoods just outside the Town and Neighborhood Centers.</td>
<td>17-23 units per acre</td>
<td>MFR-2 (A-2 &amp; A-4)</td>
<td>Recommended per Community Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SCR-MD</td>
<td>Because this zone is intended for Station Communities, it is less likely to be applied in SoHi.</td>
</tr>
<tr>
<td>Mixed Use Urban Residential (Town Center): Intended for mix of commercial and higher density residential uses with a pedestrian oriented design.</td>
<td></td>
<td>MU-C</td>
<td>Recommended per Community Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UC-MU</td>
<td>Because this zone is subject to Amberglenn Plan District design standards, it is less likely to be used in SoHi.</td>
</tr>
<tr>
<td>Mid-Rise Density Residential: Intended for high density compact residential neighborhoods in the immediate vicinity of the Town Center.</td>
<td>24-30 units per acre</td>
<td>MFR-3 (A-3)</td>
<td>Recommended per Community Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SCR-HD</td>
<td>Because this zone is intended for Station Communities, it is less likely to be applied in SoHi.</td>
</tr>
<tr>
<td>Mixed-Use Urban Commercial (Village Center): Intended for mix of larger-scale commercial and residential uses with pedestrian oriented design.</td>
<td></td>
<td>MU-N</td>
<td>Recommended per Community Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SCR-V</td>
<td>Because this zone is intended for Station Communities, it is less likely to be applied in SoHi.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UC-NC</td>
<td>Because this zone is subject to Amberglenn Plan District design standards, it is less likely to be used in SoHi.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UC-AC</td>
<td>Because this zone is subject to Amberglenn Plan District design standards, it is less likely to be used in SoHi.</td>
</tr>
</tbody>
</table>
**Urban Design Standards**

The South Hillsboro Plan District will contain design standards intended to “knit” the area together from a design perspective while allowing flexibility to establish distinct neighborhoods within SoHi. The standards will implement the Planning and Design Principles and support the overall urban design approach discussed in the Land Use and Urban Design section of this Master Plan. Generally, design standards for SoHi are likely to include the following elements (and may or may not differ from the standards in the base zone):

- Public and private open space requirements
- Landscaping and tree preservation
- Exterior lighting
- Sidewalk dining and display
- Street design cross sections and streetscape standards
- Building massing and form
- Building design and character
- Pedestrian active use requirements
- Parking location and design
- Public art
- Green building design
Action Plan & Implementation Strategy
A variety of different types of actions will be needed to implement the South Hillsboro Master Plan and achieve the vision described in this Plan, including but not limited to the following:

**Amendments to implementing plans and ordinances.** The Master Plan will include a list of specific proposed amendments to a number of implementing documents, including the following:

- South Hillsboro Community Plan, including updated maps and narrative related to land use designations, locations of major roadways, parks and other public improvements and infrastructure costs
- Hillsboro Comprehensive Plan, including revisions to Plan policies and designations, as needed to ensure consistency between the results of the Mater Planning effort and the Comprehensive Plan
- Hillsboro Transportation System Plan, including information or references to transportation facility locations, costs, phasing and funding
- Hillsboro Water and Sewer Master Plans, including updated information related to facility projects and costs
- Hillsboro Parks and Recreation Plan, including park facility locations, costs and funding strategies
- Hillsboro Development Code, including creation of a South Hillsboro Plan district and needed amendments to base zones and/or development and design standards found in Chapter 17.50 or elsewhere in the code
- System Development Charge (SDC) methodologies for water, sewer, stormwater, parks and transportation, as needed to update capital facility plans, establish supplemental SDCs and/or revise SDC fees or rates, as needed

A more detailed summary of these amendments is included later in this chapter of the Plan.

**Transportation Financing Plan.** The City is preparing a funding strategy to describe the cost and phasing of major transportation improvements and private development and the sources of money and financing mechanisms that will be used to pay for their design and construction. Financing strategies are expected to include developer contributions, area-specific system development charges, local improvement districts and use of Washington County’s Major Street Transportation Investment Program (MSTIP) and/or possibly other regional, state, or federal funds for transportation facilities. (tools to ensure their coordination [e.g., trip caps] and coordination with property owners, County, other entities)

**Key, catalytic public and private investments.** A number of key infrastructure and other projects can help the City and property owners reach priority development and community goals. Examples in SoHi include the following, among others:

- Purchase of land for and construction of neighborhood or community parks and schools, as well as urban plazas in the Town Center and Village Center areas.
- Construction of roads and other infrastructure that provide access to development and needed water, sewer and stormwater infrastructure.
- Creation of key gateways to SoHi as a whole and/or to specific neighborhoods. Gateways could include key road and pathway segments and adjacent development that provides a sense of entry into SoHi, along with associated signage, landscaping and other features that draw people into the area. Key locations for gateways into SoHi will include the intersections of Tualatin Valley Highway and Cornelius Pass
Road, 209th Avenue and Alexander/Blanton Street, Tualatin Valley Highway and Century Boulevard, and 209th Avenue and streets that provide access to the Butternut Creek area.

- Creation of initial phases of the Town Center and Village Center that will spur additional, future investment and development in these areas. In both cases, a combination of retail and commercial services and housing is expected in early phases.

**Annexation and application of zoning.** After completion of the Master Plan proposed development areas will need to be annexed into the City and specific zoning designations will need to be applied prior to development.

**Branding and marketing.** For the most part, branding and marketing efforts will be undertaken by developers and property owners in SoHi. However, to the extent that the City is interested in proactively attracting residents and business owners to locate in SoHi and/or attracting developers or builders to develop portions of the area, the City may collaborate with major property owners or initiate their own City marketing and branding efforts. Local developers, including strategies to (parks, planning, economic development, outreach to large employers, examples of celebrating success)

**Developer agreements.** The City currently has memoranda of understanding (MOUs) with the two major landowners in the area – Hagg Lake LLC (Butternut Creek area) and Newland Communities (Reed’s Crossing area). The City plans to enter into more formal development agreements with these property owners to specify obligations associated with building and funding specific public improvements as well as other issues related to the phasing and implementation of development.

The following is a table that summarizes specific actions needed in order to address the needs and issues summarized above. This draft Action List will be refined and updated as the Master Planning process moves forward and as part of subsequent implementation efforts.

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Annexation of the development areas into the City</td>
</tr>
<tr>
<td>2</td>
<td>Application of specific zoning designations</td>
</tr>
<tr>
<td>3</td>
<td>Branding and marketing efforts undertaken by developers and property owners in SoHi</td>
</tr>
<tr>
<td>4</td>
<td>City collaboration with major property owners on marketing and branding efforts</td>
</tr>
<tr>
<td>5</td>
<td>Formal development agreements with property owners to specify obligations associating with building and funding specific public improvements</td>
</tr>
</tbody>
</table>

---

**NEXT DRAFT TO INCLUDE TABLE HERE**
This page intentionally left blank.