infrastructure
9. Infrastructure

9.1 STORM AND SURFACE WATER UTILITIES

Bellevue manages surface water using a series of 26 storm drainage basins. Stormwater runoff is distributed to ten different drainage basins from the study area.

These are East Creek, Phantom Creek, Richards Creek, Vasa Creek, Kelsey Creek, Mercer Slough, Spiritridge, Sunset Creek, South Sammamish and Lewis Creek. The study area was largely developed before extensive stormwater regulations were in place to protect downstream waters, and consequently, stormwater runoff is subjected to little quality or quantity control. A patchwork of small-scale detention facilities, owned by private property owners, the city or the county, are scattered throughout the study area. These existing facilities are assumed to be working as designed but since they were designed under a different set of stormwater codes and standards, they have limited effectiveness at meeting watershed goals that new regulations are intended to meet.

Existing issues and constraints in the drainage basins are the following:

• The East Creek basin has steep slopes (BC is in this basin), degraded stream conditions and limited, even outdated, floodplain maps. Updated floodplain maps would very likely place some buildings in the floodplain. If these buildings were to redevelop they would have to meet city regulations to elevate, flood proof or otherwise reduce the risk of structural flooding. Some parcels in this basin could be subject to existing city regulations designed to protect critical areas including riparian corridors, floodplains, wetlands, and steep slopes.

• Phantom Creek basin has complicated utilities on the Boeing site (currently being made into a city park) and legacy contaminants from an old municipal landfill site. In addition, all runoff drains into Phantom Lake, which is a tributary of Lake Sammamish and therefore all new construction and redevelopment is subject to water quality standards unique to Lake Sammamish. More specifically, redevelopment in this area will be required to implement special water quality BMP’s to reduce the amount of phosphorus entering the lake.

• Issues in Richards Creek basin are centered on the complex flat storm pipe network in Factoria, and a degraded open stream. Factoria is flat, and built on historic wetland, so soil conditions are not likely to be good for infiltration.

• Vasa Creek basin is subject to downstream flooding and has a degraded open stream. Vasa Creek is also a tributary of Lake Sammamish, and subject to water quality standards. (WSDOT is a big land owner in this area and owns a regional storm water pond) Redevelopment in this area will be required to implement special water quality BMP’s to reduce the amount of phosphorus entering the lake.

• Kelsey Creek, Mercer Slough, Spiritridge, South Sammamish, and Lewis Creek drainage basin areas in the study area are mostly roads, while Sunset Creek is mostly WSDOT owned land.

Figure 42. Drainage Basins
The primary study area is 58.7% impervious, nearly 1/3rd of which is publicly owned by the State, King County or the City of Bellevue. Impervious surface area is often used as a proxy for watershed condition since research shows that functional watershed conditions begin to deteriorate once the basin is 10-15% impervious area. This suggests that the study area’s functional systems are very likely compromised.

New stormwater regulations, intended to off-set the deleterious effects of impervious surfaces on stream health, took effect on January 1, 2010, and will require new or re-developing sites to mitigate runoff to a pre-developed/forested runoff condition. This means that each parcel will be required to construct large stormwater detention storage facilities (vaults or ponds) and mitigate runoff rate and duration to those rates and durations expected from a forested watershed. This new requirement will prove costly to redevelop.

As an alternative to individual site detention, the City could consider constructing regional detention facilities that could benefit a large group of property owners. Given the high costs associated with developing large-scale stormwater detention facilities, it is possible that ‘Low Impact Development’ strategies (techniques to manage stormwater by infiltration), might become attractive to property owners/developers. To date, there is very little data on soils in the study area. Soil information is required to establish ‘Low Impact Development strategies’ as a valid alternative.

9.2 WATER UTILITIES
Available fire flows in the rest of the primary study area generally fall within the typical range for commercial and multi-family development, which is 2500 to 3500 gpm, while available fire flows are currently limited to approximately 1500 gpm in the area zoned as Office west of Richards Road.

Fire flows are generally adequate for all areas except the area zoned for office west of Richards Rd. This area’s 1500 gpm fire flow may not be enough for future development, but a detailed determination would depend on the scale and nature of new development, since fire flow adequacy is determined for each specific development proposal, and depends largely on the nature and scale of development. At the moment there is a greater possibility that utility improvements for fire flows might be required in this area.

9.3 SEWER
No sewer system capacity issues exist in any of the major sewer trunks serving the study area even with additional projected development. It is possible that sewer pipes serving local areas could require upsizing to accommodate high density multi-family residential or hotel development on a particular site.