SAN JUAN COUNTY
HEARING EXAMINER

FINDINGS, CONCLUSIONS, AND DECISION

Applicant(s):	San Juan County Public Works in care of John Cook P.O. Box 729 Friday Harbor, WA 98250
File No.:	PSJ000-17-0005
Request:	Shoreline Substantial Development Permit
Parcel No(s):	351333025, 351333022, and 351333021
Location:	5051 Pear Point Road, San Juan Island
Summary of Proposal:	An application for stormwater drainage improvements at Pear Point Road, San Juan Island
Shoreline Designation:	Rural Residential
Public Hearing:	May 18, 2017
Application Policies and Regulations:	SJCC 18.35 Critical areas SJCC 18.50.050 Archaeological and historic resources SJCC 18.50.350 Utilities SJCC 18.60.060 Clearing and grading standards SJCC 18.80.020 Project permit applications SJCC 18.80.030 Notice of project permit applications SJCC 18.80.110 Shoreline permit and exemption procedures
Decision:	Approved subject to conditions

S.J.C. DEPARTMENT OF
JUN 05 2017
COMMUNITY DEVELOPMENT

BEFORE THE HEARING EXAMINER
FOR SAN JUAN COUNTY

In the Matter of the Application of	)	
	)	NO. PSJ000-17-0005
San Juan County Public Works	)	
	)	
	)	
for approval of a shoreline permit for	)	
stormwater drainage improvements at	)	
Pear Point Road, San Juan Island	)	

S.J.C. DEPARTMENT OF
JUN 05 2017
COMMUNITY DEVELOPMENT

SUMMARY OF DECISION

The requested shoreline substantial development permit for stormwater drainage improvements at 5051 Pear Point Road, San Juan Island, is **APPROVED** subject to conditions.

SUMMARY OF RECORD

Request:
San Juan County Public Works (Applicant) requested a shoreline substantial development permit for piping installation to improve stormwater drainage at 5051 Pear Point Road, San Juan Island.

Hearing Date:
The San Juan County Hearing Examiner held an open record public hearing on the request on May 18, 2017.

Testimony:
At the open record public hearing, the following individuals presented testimony under oath:

Julie Thompson, Planner, San Juan County Department of Community Development
Johnathan Cook, San Juan County Public Works, Applicant Representative
Lynne Mercer

Exhibits:
The following exhibits were admitted in the record:

A. Community Development staff report, dated May 3, 2017, with the following attachments:

1. Request for review

2. Determination of Non-Significance, issued March 15, 2017

3. Environmental checklist

4. Application materials, including:
   a) Application form, dated received March 2, 2017
   b) Project narrative
   c) Aerial/GIS maps depicting bare earth, soil types, hydraulic soil types, and contours
   d) Construction BMPs (11x17 plans)
   e) Clearing and Grading narrative
   f) Clearing and grading plans

5. Approved Stormwater Plan prepared by San Juan County Public Works, dated December 29, 2016

6. Wessen & Associates summary letter re: Archaeological resources, dated January 24, 2017

7. Habitat Assessment memo from Michele Bodtke, Northwest Ecological Services LLC, dated February 23, 2017

8. Agency comment letters

9. Legal advertisement

10. Notification requirements

Upon consideration of the testimony and exhibits submitted at the open record public hearing, the Hearing Examiner enters the following findings and conclusions:

FINDINGS

1. The Applicant requested a shoreline substantial development permit (SSDP) for stormwater drainage improvements at 5051 Pear Point Road, San Juan Island.[1] The project would install piping to convey seasonally troublesome stormwater from Pear Point Road to the shoreline of North Bay. The shoreline of North Bay is designated as a Rural Residential shoreline environment by the San Juan County shoreline master program (SMP). Utilities are allowed in Rural Residential shoreline environments pursuant to San Juan County Code (SJCC) 18.50.350.C.2. *Exhibits A, A.1 and A.4; Julie Thompson Testimony.*

2. The project site is 1.56 acres primarily at 5051 Pear Point Road. Pear Point Road is to the north of the project area, and North Bay is to the south. Parcels to the east and west

[1] The subject property is known as Tax Parcel Number 351333025. Two neighboring tax parcels, 351333022 and 351333021, are also affected. *Exhibit A.*

are developed with residential uses, as is the subject property. Topographically, the land slopes gently down from Pear Point Road to North Bay. The proposed project area contains fish and wildlife habitat conservation area (FWHCA) regulated pursuant to the San Juan County critical areas ordinance established at San Juan County Code (SJCC) Title 18.35, but no other regulated critical areas such as streams, forage fish spawning areas, pocket beaches, or feeder bluffs. It is located within a Special Flood Hazard Area (SFHA) Zone A associated with Argyle Lagoon/North Bay and therefore must comply with the Puget Sound Biologic Opinion Floodplain Habitat Assessment minimum standards and the Endangered Species Act (ESA). The path of the proposed stormwater facilities crosses a recorded archeological site known as site 45SJ407. *Exhibit A.*

3. Currently, stormwater runoff from this part of Pear Point Road crosses under the road in a 12-inch diameter culvert with flow conveyed in a shallow ditch to a small weir, from which point it travels in a four-inch diameter pipe under a driveway and empties into a broad, shallow swale. The swale conveys the flow to a small detention pond with outlet to a 12-inch diameter pipe crossing the subject property's driveway. The flow is conveyed from this point in a small channel that discharges on the beach and sheet flows to North Bay west of Argyle Lagoon. However, soil types in the area become seasonally saturated, causing stormwater to sheet-flow around both sides of the subject residence rather than conveying in the channel, resulting in flooding on-site. *Exhibit 4b.*

4. The proposal consists of installing 12-inch HDPE piping from Pear Point Road to the bluff at the shoreline to convey stormwater and groundwater flow to North Bay. Project components include: two catch basins with solid lids; replacement of gravel driveways, fences, and landscaping impacted by construction; and replacement of chip sealed roadway in Pear Point Road where existing the cross culvert would be removed and the new culvert installed. All but the 100 feet of the pipe closest to the shoreline would be buried in trenches and revegetated, with the site restored to its current condition and natural grade. The last 100 feet of pipe would travel through the recorded archeological site and would therefore not be trenched but would rather lay on the existing ground surface and be covered with fill to make a mound. To minimize impact to archaeological resources, the pipe and fill would be placed on top of a geofabric barrier that would keep fines from migrating and prevent the mixing of fill material into archaeological soils. This fill material would be placed using light-weight equipment and by hand and would not be compacted. At the end of the pipe waterward of the ordinary high water mark (OHWM), a culvert sock connected to a diffuser T would convey flows down the short bluff. The culvert sock would prevent soil erosion, reduce water dispersion speed, and promote shoreline stability. The diffuser T would reduce potential sediment erosion in the nearshore area. The end of the sock and diffuser T would be anchored to the beach with rebar placed in the sediment; the rebar would not stand up taller than the height of the diffuser T and should not present a hazard. Because anchoring is only proposed at the end of the sock/diffuser T, it is not expected to affect natural shoreline processes the way a solid structure would. *Exhibits 4, 4b, 4d, 4e, and 7.*

5. The submitted clearing and grading plans shows that a total of 25,174 square feet of surface would be disturbed. No new impervious surfaces would be created. Fill material would be sourced from existing County stockpiles, primarily leftover from other construction projects and shoulder-pulls, which is typically a mixture of clay and topsoil with a significant amount of organic material. No excess material is anticipated as part of the project. All fill material placed would be vegetated in accordance with the stormwater management plan, which was approved by the County Stormwater Engineer. The stormwater management plan includes a stormwater construction pollution prevention plan. The preliminary design plans depict all erosion control best management practices. *Exhibits 4b,4d, 4e, 4f, 5, and 8*

6. Archaeological site 45SJ407 was studied in 2004 and was determined to contain intact prehistoric deposits more than 2,000 years old, including human remains. This significant archeological resource is eligible for listing on the National Register of Historic Places. The Applicant retained the services of the same consulting archeologist who prepared the 2004 study to review the proposed grading and construction plans, and also consulted with the Lummi Nation, to best minimize impacts to the cultural resource. The archeological consultant noted that no ground disturbance was proposed within the recorded site; however, he noted that the Washington Department of Archeology and Historic Preservation (DAHP) would likely require work within the site to be monitored by a professional archeologist. Also, within the archeological site buffer, where the pipe is proposed to be buried in a trench, the consultant recommended professional monitoring of that ground disturbing activity. He also recommended that the Applicant consult with DAHP about whether an excavation permit is required for the work in the site. *Exhibit 6.* Planning Staff incorporated these recommendations into recommended conditions of permit approval. *Exhibit A.*

7. Because the pipe buried beneath fill on the surface would create the potential for ponding (a "bathtub" pond in an area measuring 6,300 square feet and one foot deep) as a result of direct precipitation and of the Mercer residence runoff, a cross-drain would be placed below the new stormwater pipe to convey any standing water via sheetflow in its existing path to the east. For most storms, stormwater is anticipated to infiltrate without needing the cross-drain. For those storms causing the cross drain to activate, flows would discharge at a low enough velocity that no erosion is anticipated to be caused on the neighboring property (Leblanc) under any condition. *Exhibit 4b.*

8. The Applicant obtained a professionally prepared habitat assessment addressing shoreline and critical areas issues, specifically the site's inclusion in the Special Flood Hazard Area associated with Argyle Lagoon and the County-regulated FWHCA. Species listed pursuant to the Endangered Species Act (ESA) that are known to be present in the project area include Puget Sound Chinook, Puget Sound Steelhead, Hood Canal summer run chum, Lake Ozette sockeye, and southern resident orca. The habitat assessment noted that zone of potential aquatic impacts includes salmonid critical habitat but that the proposed construction - trenching, placing a gravel bed in the trench, installing the 12-

inch pipe, and backfilling and revegetating with native grasses - would be above the ordinary high water mark (OHWM) and the highest astronomical tide line and would result in only temporary impacts. The assessment concluded that there would be minimal to no impacts to salmon habitat functions. Noting that conveying stormwater flows through a pipe rather than across a swale would reduce water quality functions, the assessment concluded that this reduction would be balanced with reduction in water quality degradation from eliminating exposure to surface pollutants from surrounding land uses. The 100 feet of pipe closest to the shoreline, including approximately 10 linear feet below the highest astronomical tide line, would be placed in a mound. The fill footprint waterward of the HAT line, but above the OHWM, would be approximately 40 square feet of area currently available for forage and refuge during flood events. During a 100-year storm, salmonids may be present when the site is flooded; however, during normal conditions salmonids and orca would not be present at the site. The habitat assessment determined that the loss of 40 square feet of refuge and forage habitat would be negligible because the location is directly adjacent to marine tidal waters. The consultant found that the project would not significantly alter flood volume, storage, or velocity. Given the proposed use of the culvert sock and diffuser T, the lack of additional impervious surfaces, and proposed best management practices, the assessment concluded that the proposal may affect but is not likely to adversely affect orca, Puget Sound Chinook, Puget Sound steelhead salmon, or critical habitat of these species, and that the proposal would have no effect on Hood Canal summer run chum, Lake Ozette sockeye salmon, and Puget Sound steelhead salmon critical habitat. *Exhibit 7.*

9. The marine shoreline area adjacent within and adjacent to the project site is a fish and wildlife habitat conservation area (FWHCA). Patches of eelgrass and patchy fringe salt marsh are mapped along the shoreline of Argyle Lagoon; however, neither of these habitats are located within the project area. No direct impact on these habitats is anticipated from the project. Because the project is changing the mode of transport of water in the existing drainage, without increasing impervious surfaces or substantially altering pollution generation capacity along the flow route, habitats in the lagoon are not expected to be impacted by the project. Due to tidal mixing it is anticipated that there would be an insignificant change in water quality due to the project long term. Planning Staff determined that the project complies with applicable requirements of the critical areas ordinance, SJCC Chapter 18.35. *Exhibits A and 7.*

10. There are three trees in the shoreline area that may need to be removed for proper installation of the proposed drainage facilities. Because the subject shoreline contains the recorded archeological site, any removed trees could not be replaced within the shoreline. The Applicant indicated that efforts not to remove the trees are intended but that if they must be removed, native tree species would be replanted at other suitable locations. Additional trees and shrubs along one of the property lines would be replaced as part of this project. *Exhibits A and 4.* The owner of the subject property testified that the trees are non-native elms, an invasive species, and she would not be sorry to see them go. *Lynne Mercer Testimony.*

11. The Applicant and the property owner have been working on a solution to the subject property's drainage problems since 2005. A 25- to 50-year storm in February 2016 caused the existing drainage facilities to fail, resulting in significant erosion, washing of soils out of the driveway, inundation of the area where the propane tank is, and health concerns with the saturation of the septic drainfield. County Public Works representatives met at the site with Lummi Tribe agents and a Washington Department of Fish and Wildlife representative to review all alternatives. Among alternative solutions considered, a "do nothing" alternative was not included. Disbursing stormflows to the east was determined not to be feasible due to the location of the University of Washington biological preserve in Argyle Lagoon. Flows routed to the west would exacerbate an existing drainage problem near 77 North Bay Lane. One alternative was to route stormflows to the south of the Mercer residence through a bioswale or pipe where they would disburse and sheetflow southeast towards the neighboring parcel (Leblanc) before entering the shoreline. However, the bioswale would not be able to be built deep enough to meet design standards without creating potential impacts to the archeological site. Flows in such a facility could also possibly result in gully erosion and head-cutting which could expose the archeological site to the surface, and for these reasons the concept was rejected. The only remaining option was to pipe the flows to the shoreline across the archeological site while minimizing impacts. *Exhibit 11; Johnathan Cook Testimony.*

12. Consistent with the State Environmental Policy Act (SEPA), San Juan County assumed lead agency status for review of the proposal's environmental impacts. A determination of non-significance (DNS) was issued March 15, 2017. No comments were received on the DNS. *Exhibits A, 2, and 3.*

13. The application was submitted and deemed complete on March 2, 2017. Notice of the application was mailed to surrounding property owners and published on March 15, 2017, and posted on-site on March 14, 2017. Notice was specifically sent to San Juan County Public Works Stormwater Engineer, Lummi Nation Culture Department, and UW Friday Harbor Labs. *Exhibits A and 1; Julie Thompson Testimony.*

14. Lummi Nation Culture Department agreed with the recommendation of the Applicant's consultant that a professional archaeologist should monitor the proposed development. *Exhibits A and 8.*

15. The County received comments from UW Friday Harbor Labs with concerns of potential impact on archaeological resources and the marine environment. They noted the project site is adjacent to Argyle Lagoon and Argyle Creek, two University-owned areas that contain biological preserves and constitute a critical habitat for marine organisms. They questioned whether the proposal would differ much from the existing stormwater drainage system with outflow just going further down the beach. They also expressed concern that the project could increase contaminants and fine sediment load dumping

onto the beach and questioned whether the "culver sock" would easily clog. *Exhibits A and 8.*

16. Addressing UW Friday Harbor Labs comments about contaminants reaching the beach as a result of the new stormwater conveyance, the Applicant representative noted that this stretch of Pear Point Road is only about one-quarter mile long and does not have high traffic volumes. He testified that majority of the flows are comprised of ground water. With regard to sediment loading, the representative noted that culvert sock is a flexible plastic pipe that clamps onto the end of the 12-inch HDPE pipe and that no anchoring is required for the sock. Although it is a new technology, other County culvert sock projects have been in service for a couple of years and are holding up. Washington Department of Fish and Wildlife is requiring a diffuser T at the end. Because the shoreline contains surf smelt and sand lance spawning habitat, the improvements must stay above the ordinary high water mark. The representative noted that the County would be maintaining the improvements as a stormwater facility. He further noted that they would be trying not to take out trees, but if they do, the non-native elms would be replaced with native species where the Planning Department directs them to be planted. *Cook Testimony; Exhibit 11.*

17. The owner of 5051 Pear Point Road, Lynne Mercer, was the only person providing public comment at the hearing. She requested that the trees, if replaced, not be the same species. She noted that the beach contains a lot of driftwood but that tides do not usually come up to the base of the bank, meaning that the diffuser T and culvert sock would not encounter conflict with driftwood regularly. She added that the ditch collecting the stormwater is on the landward side of Pear Point Road, which she surmised means that the stormwater is cleaner. She urged approval, noting that she's been working with the County 13 years to try to correct the existing drainage issues. *Lynne Mercer Testimony.*

18. Element 3 of the Comprehensive Plan establishes goals and policies for shoreline development. Upon review, Planning Staff determined that the installation of the proposed stormwater management facility would be consistent with these goals and policies and recommended approval with conditions. *Julie Thompson Testimony; Exhibit A.* The Applicant representative waived objection to conditions. *Cook Testimony.*

CONCLUSIONS

Jurisdiction:

The Hearing Examiner is granted jurisdiction to hear and decide applications for shoreline substantial development permits, pursuant to Chapter 36.70.970 of the Revised Code of Washington and Chapters 2.22 and 18.80 of the San Juan County Code.

Criteria for Review:

Criteria for Approval of Substantial Shoreline Development Permits

Pursuant to SJCC 18.80.110.H, a shoreline substantial development permit shall be granted by the County only when the applicant meets the burden of proving that the proposal is:

1. Consistent with the policies of the Shoreline Management Act and its implementing regulations, Chapter 90.58 RCW and Chapter 173-27 WAC, as amended;

2. Consistent with the policies and regulations of the Shoreline Master Program in Chapter 18.50 SJCC;

3. Consistent with this chapter;

4. Consistent with the applicable sections of this code (e.g., Chapter 18.60 SJCC); and

5. Consistent with the goals and policies of the Comprehensive Plan.

Other Applicable Provisions of the San Juan County Code

SJCC 18.35.130.G. Standards and Requirements for Shoreline Modifications

1. General Standards.

   a. Definitions. Definitions applicable to this subsection (G) are found in RCW 90.58.030 and WAC 173-26-020 and 173-27-030.

   b. Mitigation Sequencing. Per WAC 173-26-201(2)(e), adverse impacts associated with new, expanded or replacement shoreline modifications must be mitigated consistent with the requirements of SJCC 18.35.020 through 18.35.050 and the following mitigation sequence:
      i. Avoiding the impact altogether by not taking the action or part of the action.
      ii. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts.
      iii. Rectifying the impact by using appropriate technology or by repairing, rehabilitating or restoring the affected environment.
      iv. Reducing or eliminating the impact over time by preservation and maintenance operations.
      v. Compensating for the impact by replacing, enhancing or providing substitute resources or environments.
      vi. Monitoring the impact and compensation projects and taking appropriate corrective measures. Chapter 18.50 SJCC, construction of new shoreline modifications is prohibited.

SJCC 18.35.075 Frequently flooded areas.

A. Applicability. This section applies to all areas of special flood hazards within the jurisdiction of San Juan County as identified by the Federal Insurance Administration on its Flood Insurance Rate Maps (FIRMs), now existing or as later amended, which are hereby adopted by reference and declared to be part of this code. The director shall maintain the most current FIRMs on file at the department. Where differences exist between the FIRMs and conditions in the field, conditions in the field shall control.

B. Protection Standards. All developments in areas of special flood hazards must first meet the requirements of the San Juan County Code including any subarea or activity center plans and the San Juan County health and building codes adopted in Chapters 13.04 and 15.04 SJCC, respectively. When allowed, such developments shall also meet the requirements for floodproofing or construction as detailed in Chapter 15.12 SJCC, Flood Hazard Control Regulations.

SJCC 18.50.350 Utilities.

A. Regulations – General.

1. In shoreline areas, utility transmission lines, pipelines, and cables must be placed underground unless demonstrated to be infeasible. Further, such lines must utilize existing rights-of-way whenever possible. Proposals for new corridors in shoreline areas involving water crossings must fully substantiate the infeasibility of existing routes.

2. Utility development must, through coordination with government agencies, provide for compatible multiple use of sites and rights-of-way. Such uses include shoreline access points, trails, and other forms of recreation and transportation systems, providing such uses will not unduly interfere with utility operations or endanger public health and safety.

3. Sites disturbed for utility installation must be stabilized during and following construction to avoid adverse impacts from erosion.

4. Immediately following the completion of utilities installation of maintenance projects on shorelines, disturbed areas must be restored to project configurations, replanted with local vegetation, and the vegetation maintained until it is firmly established.

5. Utility lines, pipes, stations, plants, and other apparatus shall not be installed in shoreline areas unless there is no feasible alternative.

6. Utility lines shall be installed underground. Desalination intake and discharge lines shall be located underground wherever feasible, except for that portion located underneath or along any docks, piers, walkways, stairs, or other shoreline improvements located on the site.

7. Underwater cables which must cross shorelines shall be installed underground from the water line to the tree line, unless otherwise authorized by the County. The County shall authorize variances from this regulation only for good cause.

8. Where installation of utility lines, pipes, or other apparatus in shoreline areas is approved, clearing shall be confined to that which is absolutely necessary to permit the installation and to prevent interference by vegetation once the system is in operation.

9. Where utility lines, pipes, or other apparatus must cross shoreline areas, they shall do so by the route which will cause the least damage to the shoreline, both physically and visually.

10. Drainage and surface runoff from utility installation areas shall be controlled so that pollutants will not be carried into water bodies.

11. Applications for outfalls and underwater pipelines that transport substances harmful or potentially harmful to aquatic life or water quality shall not be approved unless the applicant has demonstrated that no significant adverse impacts will result. Desalination and reverse osmosis brine discharge is not considered to be potentially harmful to aquatic life or water quality provided all required state and federal requirements are met.

B. Regulations – Desalination. (n/a)

C. Regulations by Environment.

1. Urban. Utility facilities shall be permitted in the urban environment subject to the policies and regulations contained in this master program.

2. Rural, Rural Residential, and Rural Farm-Forest. Same as urban.

...

SJCC 18.60.060 Clearing and grading standards.

...

E. Grading.

1. Project or building permits which involve grading of 100 or more cubic yards are subject to environmental review under the State Environmental Policy Act (SEPA) (see SJCC 18.80.050), unless the grading is SEPA-exempt under WAC 197-11-800.

2. Clearing and Grading Permit. The clearing and grading permit is a development permit that is processed using the procedures under the Uniform Building code, adopted as the San Juan County building code, Chapter 15.04 SJCC.

   a. All grading of 500 cubic yards or more is subject to a clearing and grading permit, except grading associated with the following: (n/a)

b. Applications for projects which require a clearing and grading permit shall include the following information:
   i. Source of fill material and deposition of excess material;
   ii. Physical characteristics of fill material;
   iii. Proposed methods of placement and compaction;
   iv. Proposed surfacing material;
   v. Proposed method(s) of drainage and erosion control;
   vi. Methods for restoration of the site;
   vii. Demonstration that instream flow of water will remain unobstructed;
   viii. Demonstration that erosion and sedimentation from outflow channels will be minimized by vegetation or other means; and
   ix. Demonstration that pond runoff will be controlled to protect adjacent property from damage.

Conclusions Based on Findings:

1. As conditioned, the proposed utility project would be consistent with the Shoreline Management Act (SMA). The policy of the SMA, as set forth in RCW 90.58.020, is to "provide for the management of the shorelines of the state by planning for and fostering all reasonable and appropriate uses." This policy "contemplates protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life, while protecting generally public rights of navigation and corollary rights incidental thereto." *RCW 90.58.020*. Pursuant to the County's Shoreline Master Program, utilities are allowed in the Rural Residential shoreline environment. The habitat assessment credibly establishes that the proposal would have no effect, or may affect but is not likely to adversely affect, the ESA-listed species known to be present in the vicinity. The proposal was reviewed for compliance with SEPA and a DNS was issued. Compliance with the conditions imposed herein and development of project as reviewed in the habitat assessment would ensure that adverse effects to the waters of the state are avoided. *Findings 1, 2, 3, 4, 5, 8, 9, 11, and 12.*

2. The proposal satisfies applicable shoreline master program policies and regulations as follows. Utilities are allowed in the Rural Residential shoreline environment subject to compliance with SMP regulations. The project would not increase impervious surfaces and would not alter the area from which the stormwater flows in question originate in any way. The same quantities of water would be conveyed in a pipe rather than through the swales which have been historically ineffective at controlling flows. Regarding SMP utilities regulations, the new pipe would be underground for all of its length but the 100 feet closest to the shoreline, which must be placed on the ground surface to avoid adverse impacts to a significant archeological site. No other utilities are involved. The approved stormwater plan includes stabilizing the site following construction. Vegetation removal in the shoreline jurisdiction would be minimized. If trees along the shoreline must be removed, native tree species would replace them at suitable locations within the project area outside of the archeological site. No alternative site for the stormwater facility route

is feasible. No additional pollutants would be picked up by the stormwater flows as a result of the proposal; instead, by piping the flows rather than conveying them across a surface swale that is a lawn, the flows would not be exposed to lawn chemicals and pet wastes that typically occur in yards. The project has been designed to minimize impacts to the archeological site by piping the flows at surface level, with the pipe placed on a geotextile fabric to prevent mixing of the fill required to cover the pipe with the archeological soils. As conditioned, all ground disturbing activity in the archeological site buffer and all work in the archeological site proper would be observed by a professional archeologist. The proposed culvert sock and diffuser T would prevent soil erosion, reduce water dispersion speed, promote shoreline stability, and reduce nearshore sediment erosion. The habitat assessment submitted to address the special flood hazard area and fish and wildlife habitat conservation area credibly concluded that the project as designed would result in no adverse effects to ESA-listed species. The report satisfies the requirements of SJCC 18.35. No outfalls, underwater cables, underwater pipelines, or desalination facilities are proposed. *Findings 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, and 16.*

3. The project would comply with the clearing and grading standards of SJCC 18.60. Conditions would ensure that all stages of development follow the mitigation measures identified in the erosion control and stormwater pollution prevention plans. *Findings 4, 5, and 7.*

4. As concluded above, the proposal would comply with SMP regulations relating to archeological resources, critical areas, and general utilities regulations. In adhering to the applicable SMP provisions, the project would be consistent with the goals and policies of the County's Comprehensive Plan. *Findings 2, 4, 6, 8, 9, 11, and 18.*

DECISION

Based on the preceding findings and conclusions, the requested shoreline substantial development permit for stormwater drainage improvements at 5051 Pear Point Road on San Juan Island is **APPROVED** subject to the following conditions:

1. Construction shall not be commenced until all relevant appeal periods have run.

2. Compliance with the approved stormwater management plan in Exhibit 6 shall be required.

3. To minimize disturbance to cultural resources, no excavation is allowed within the boundaries of archaeological site 45SJ407. Fill will be placed over this area, and the new culvert will be set on top of the fill before covering.

4. A professional archaeologist shall be on site during work within archaeological site 45SJ407.

5. Development under this permit shall commence within two years of the date of permit approval and shall be substantially complete within five years thereof or the permit shall become null and void.

6. Failure to comply with any terms or conditions of this permit may result in its revocation.

Decided June 5, 2017.

By: Sharon A. Rice

Sharon A. Rice
San Juan County Hearing Examiner

Effective Date, Appeal Right, and Valuation Notices
Hearing examiner decisions become effective when mailed or such later date in accordance with the laws and ordinance requirements governing the matter under consideration. SJCC 2.22.170. Before becoming effective, shoreline permits may be subject to review and approval by the Washington Department of Ecology pursuant to RCW 90.58.140, WAC 173-27-130 and SJCC 18.80.110.

This land use decision is final and in accordance with Section 3.70 of the San Juan County Charter. Such decisions are not subject to administrative appeal to the San Juan County Council. See also, SJCC 2.22.100.

Depending on the subject matter, this decision may be appealable to the San Juan County Superior Court or to the Washington State Shorelines Hearings Board. State law provides short deadlines and strict procedures for appeals and failure to timely comply with filing and service requirements may result in dismissal of the appeal. See RCW 36.70C and RCW 90.58. Persons seeking to file an appeal are encouraged to promptly review appeal deadlines and procedural requirements and consult with a private attorney.

Affected property owners may request a change in valuation for property tax purposes notwithstanding any program of revaluation.

WHATCOM COUNTY
PLANNING & DEVELOPMENT SERVICES

LAND CAPACITY ANALYSIS REPORT

I. Background Information

The purpose of this report is to compile results of the land capacity analysis (LCA) that was done for each of Whatcom County's urban growth areas (UGAs) as part of the 2016 Whatcom County Comprehensive Plan (WCCP) periodic update process. Whatcom County Planning and Development Services staff and planners from each city developed and completed the LCA to estimate each UGA's capacity for population and employment growth during the 20-year planning period for the County and city 2016 comprehensive plan updates. These estimates are shown in Figures 1 and 2 below. Appendix A contains the summarized LCA calculations for each UGA.

Throughout the current periodic update process, County and city decision makers referred to the LCA estimates as part of their deliberations to determine population and employment allocations and boundaries for the UGAs, ensuring that the land area within the UGA boundaries is sufficient to permit projected urban growth within the WCCP's planning period. The Growth Management Act (GMA) requires that, "Based upon the growth management population projection made for the county by the Office of Financial Management, the county and each city within the county shall include areas and densities sufficient to permit the urban growth that is projected to occur in the county or city for the succeeding twenty-year period..." RCW 36.70A.110(2).[1]

II. LCA Estimates

Figures 1 and 2 compare the LCA's estimated population and employment capacities with the population and employment growth allocations adopted in the 2016 Whatcom County Comprehensive Plan, Chapter 1. Comparison of UGA total population capacity and the UGA total population allocations in Figure 1 shows a countywide growth capacity surplus of 6.2%. Each UGA has a population growth capacity surplus or deficit within 6% of the allocation, with the exception of the Blaine UGA, which has considerable surplus capacity within its city limits. Figure 2 shows a countywide employment capacity surplus of 12.6%.[2]

[1] The overall county population growth projection chosen by the County Council is within the range projection provided by the State Office of Financial Management (OFM). The OFM does not provide 20-year growth projections for each UGA. A consultant, Berk, developed a range of allocations that could be adopted for each UGA, based on historic distribution of population growth among the UGAs. During the update process, the cities recommended and the County approved UGA allocations and boundaries taking into consideration the Berk ranges and the LCA estimates. Berk: "Whatcom County Population and Employment Projections and Urban Growth Area Allocations," November 1, 2013

[2] Figure 2's estimated employment capacity for the Birch Bay, Columbia Valley, and Lynden UGAs differ from previously presented capacity figures because the earlier estimates had been based on outdated employment

Figure 1. Population Growth Capacity and Allocations

UGA	Est. UGA Capacity	WCCP Allocation	Surplus (Deficit)	Surplus Percent	Allocation Growth Share
Bellingham	33,006	31,050	1,956	5.9%	44.6%
Birch Bay	5,250	5,282	(32)	-0.6%	7.6%
Blaine	6,445	4,414	2,031	31.5%	6.3%
Cherry Point	-	-	-	n/a	0.0%
Columbia Valley	1,377	1,345	32	2.3%	1.9%
Everson	1,305	1,242	63	4.8%	1.8%
Ferndale	6,538	6,833	(295)	-4.5%	9.8%
Lynden	6,472	6,403	69	1.1%	9.2%
Nooksack	1,001	990	11	1.1%	1.4%
Sumas	884	874	10	1.1%	1.3%
UGA Total	62,278	58,433	3,845	6.2%	83.9%
Non-UGA		11,217			16.1%
Total		**69,650**			100.0%

Figure 2. Employment Growth Capacity and Allocations

UGA	Est. UGA Capacity	WCCP Allocation	Surplus (Deficit)	Surplus Percent	Allocation Growth Share
Bellingham	27,302	22,641	4,035	15.1%	61.1%
Birch Bay	589	545	44	7.5%	1.5%
Blaine	2,687	2,097	590	22.0%	5.7%
Cherry Point	951	890	61	6.4%	2.4%
Columbia Valley	376	359	17	4.5%	1.0%
Everson	758	602	156	20.6%	1.6%
Ferndale	3,807	4,000	(193)	-5.1%	10.8%
Lynden	1,694	2,157	(463)	-27.3%	5.8%
Nooksack	106	115	(9)	-8.5%	0.3%
Sumas	460	445	15	3.3%	1.2%
UGA Total	38,730	33,851	4,879	12.6%	91.4%
Non-UGA		3,201			8.6%
Total		**37,052**			100.0%

capacity assumptions. These estimates have been revised to reflect employment capacity assumptions currently given in the Land Capacity Analysis Detailed Methodology, section 5.2, step 6, increasing the estimated capacity by 33 in Birch Bay, 9 in Columbia Valley, and 27 in Lynden. Also differing from previous estimates is the Everson UGA employment capacity, where previous estimates used infrastructure deductions of 20% and 15% for commercial and industrial land, respectively. City staff had suggested 15% and 20% respectively, so PDS has made that change in the final LCA summary, resulting in an employment capacity reduction of 7 jobs.

The tables in Appendix A show the calculation totals for each step of the LCA. Those tables show the totals for all the UGA as well as the totals for incorporated and unincorporated (county) portions of the UGAs. The more detailed tables showing the calculations for each zone are available from Whatcom County PDS.

III. LCA Methodology

To estimate population and employment capacities, the LCA analysis first inventories the total acreage available for development in each zoning classification in each UGA (both the incorporated and unincorporated portions) and then estimates the capacity for population and employment growth on that acreage based on assumed densities and other factors. In general, the steps the LCA followed in order to make the determination that sufficient land capacity exists in each UGA is as follows:

- Assemble geographic information system (GIS) parcel data for each UGA study area
- Categorize parcels: Vacant, partially used, underutilized, developed, publicly owned, etc.
- Calculate net developable acres by subtracting: developed land, public land, future public and quasi-public land, critical areas, infrastructure area, and market factor
- Multiply net developable residential acres by assumed densities to determine dwelling unit capacity
- Multiply dwelling unit capacity by occupancy rates and persons-per-household to determine population growth capacity by UGA
- Multiply net developable commercial and industrial acres by assumed floor area ratios, occupancy rates, and employment densities to determine employment growth capacity
- Compare capacity with allocated 20-year population and employment growth (see Figures 1 and 2)

A more detailed discussion of the process is found in the Whatcom County Land Capacity Analysis Detailed Methodology, attached in Appendix B. The County and city planners working on the LCA developed this document based on the one that was used on the 2009 LCA, and revised it as necessary when specific methodological issues needed to be clarified and memorialized. The Whatcom County Council reviewed the LCA methodology document in November of 2014.

The Detailed Methodology prescribes how subtractions for such factors as critical areas and infrastructure are to be made, and how certain assumptions are to be factored in. Assumptions used in the LCA calculation include:

- Acreage needed for future public uses
- Acreage needed for infrastructure (rights-of-way, stormwater facilities, etc.)
- Market factor
- Residential occupancy rate (single- and multi-family)

- Persons per household (single- and multi-family)
- Floor area ratio (commercial and industrial)
- Occupancy rate (commercial and industrial)
- Employment density (commercial and industrial)
- Residential densities for each zone
- Non-residential proportion in mixed use zones

The assumptions used for each UGA LCA are listed in the tables in Appendix C. Some assumptions are set by the LCA Detailed Methodology document, such as occupancy rates and household size. Others, including assumed residential densities, are established by City planning staff (or in the case of the non-city UGAs County planning staff) based on their knowledge of local conditions. City and County planning staff set the assumptions for residential occupancy rates and household size at the levels calculated by OFM for the 2010 census year. They agreed to assume constant values for these factors rather than introducing an additional assumption that speculates whether – or by how much – either rate would change over the planning period.

The LCA Detailed Methodology also prescribes how to account for "pending" projects, those projects approved but not yet built. Because the number of residential units (or square footage of non-residential development) has been approved, those figures do not need to be calculated in the LCA as they do for other developable land. Thus, the acreage for pending projects is removed from the LCA calculation for developable acres, and the approved units or square footage totals are accounted for during the final calculation of population and employment capacity. This method is also used for master planned areas, where cities have approved plans with specific dwelling unit or square footage totals.

IV. Other Information

In addition to producing the overall UGA population and employment capacity estimates, the LCA has yielded other information that is useful to the periodic update process. An intermediate step in the LCA calculation is to calculate the capacity for single- and multi-family dwelling units in each UGA (see Figure 3). This breakdown indicates a variety of both types of housing would be available throughout the UGAs. Countywide, a majority of dwelling units would be single-family, while single-family would account for about a third of the future dwelling unit (DU) capacity in the Bellingham UGA. This information was used in the 2015 Whatcom County Housing Analysis[3], incorporated into WCCP Chapter 3 Housing.

[3] 2015 Whatcom County Housing Analysis, Chart 64, updated in 2016 to reflect the current approved allocations and UGA boundaries. Chart 65 estimates the number of dwelling units needed during the planning period, based on the population growth allocated to each UGA in the WCCP. A comparison of Charts 64 and 65 indicates that the planned capacity of single- and multi-family housing in the UGAs is consistent with anticipated housing needs.

Figure 3. Estimated Single- and Multi-family Dwelling Unit Capacity

UGA	SF DU Capacity	Percent SF Capacity	MF DU Capacity	Percent MF Capacity
Bellingham	5,890	34.4%	11,234	65.6%
Birch Bay	2,473	66.6%	1,240	33.4%
Blaine	2,649	84.0%	503	16.0%
Columbia Valley	627	100.0%	-	0.0%
Everson	454	96.0%	19	4.0%
Ferndale	2,080	83.5%	411	16.5%
Lynden	1,644	57.4%	1,220	42.6%
Nooksack	340	100.0%	-	0.0%
Sumas	183	48.8%	192	51.2%
All UGA	16,340	52.4%	14,819	47.6%

Figure 4 compares the achieved densities with the overall planned residential densities assumed in the LCA, and with WCCP density goals. These overall planned densities are generally consistent with achieved densities during the previous decade (from subdivision data compiled by the cities), and with the overall density targets set in WCCP Goal 2P. Figure 4 shows Goal 2P density targets from both the 2009 plan and the draft 2016 plan, in which some density goals are to be increased during the planning period.

Figure 4: Overall Residential Density

UGA	Achieved 2004-2013	LCA Est. Overall Density*	2009 WCCP Goal 2P	2016 WCCP Goal 2P
Bellingham	6.94	7.15	6 to 24	6 to 24
Birch Bay	5.93	7.61	4	5 to 10
Blaine	6.98	4.71	4	4 to 6
Columbia Valley	n/a	4.00	4	4 to 6
Everson	4.76	4.01	4	4 to 6
Ferndale	6.20	5.01	5 to 10	6 to 10
Lynden	4.95	7.43	5 to 10	6 to 10
Nooksack	4.20	4.39	4	4 to 6
Sumas	3.32	4.87	4	4 to 6

*LCA overall density applies to the areas where the LCA calculates DUs and population capacity from developable acreage. These figures do not include pending projects or master planned areas.

GMA allows that, "An urban growth area determination may include a reasonable land market supply factor...In determining this market factor, cities and counties may consider local circumstances." RCW 36.70A.110(2). The purpose of the market factor is to account for a proportion of developable land in a UGA that will not be on the market during the planning period. In the Whatcom County LCA the market factor percentage is deducted from developable acres to estimate how many acres

are expected to be both developable *and available* between now and 2036. This results in each UGA's land area being larger than the minimum needed to accommodate its projected growth. The market factor allowance provides something of a cushion against cyclical economic booms and busts, providing within each UGA a pool of land that will likely not be on the market during a downturn, but could become available during an economic upswing when demand for housing or commercial/industrial development is higher.

Figure 5. Market Factor

UGA	Overall Market Factor
Bellingham	19.8%
Birch Bay	17.4%
Blaine	39.9%
Cherry Point	16.4%
Columbia Valley	15.5%
Everson	25.8%
Ferndale	20.4%
Lynden	20.5%
Nooksack	21.1%
Sumas	18.6%

Market factor percentages used in the Whatcom County LCA vary based on whether or not a property is vacant (and therefore more likely to be available for development in the planning period). The LCA Detailed Methodology sets a market factor of 15% for vacant land and 25% for partially developed or underutilized land, but allows for different percentages to be used to account for local conditions. Figure 5 shows the overall percentage of potential developable land subtracted as a market factor. The overall market factor falls between 15% and 25% for each UGA except Everson and Blaine, where City planning staff has assumed higher market factors in some areas within city limits due to floodplain issues and current lack of utilities, respectively. These issues add to the cost of development, making the land less likely to develop at urban levels within the planning period. In Blaine and Bellingham, some master planned areas in the city limits were also assigned higher market factors, reflecting anticipated buildout periods that extend beyond 2036, thus leaving much of these areas' development potential off the market during the WCCP planning period. In these areas, the market factors are subtracted from the approved number of units rather than acreage, so they are not reflected in the overall market factor percentages in Figure 5.

IV. Conclusion

The LCA, developed in a collaborative effort by County and city planning staff, has been a vital tool used throughout the WCCP periodic update process. Now that the UGA boundaries and their population and employment growth allocations have been set, this report provides a final compilation and summary of the LCA estimation process.

Attachments:

Appendix A – LCA Summaries
Appendix B – LCA Detailed Methodology
Appendix C – LCA Assumptions

Appendix A

LCA Summaries

Land Capacity Analysis Summary
Bellingham UGA

Net Developable Land Estimate

Assumptions		All UGA	All City Zones	All County Zones
	Total Parcel Acres	**19,259.1**	**14,502.8**	**4,756.2**
	- Fully Developed Private Acres	6,784.1	5,762.6	1,021.5
	- Publicly Owned Vacant Acres	2,154.9	1,997.8	157.1
	- Publicly Owned Developed Acres	1,078.0	1,004.6	73.4
	- Quasi Public Developed Acres	944.4	750.4	194.0
	- Pending Project Acres (approved DU's added below)	1,677.5	515.7	1,161.8
	- Master Plan Acres (approved DU's added below)	1,075.4	1,075.4	-
	Remainder - all Vacant, PU, and UU Acres	**5,544.6**	**3,396.3**	**2,148.4**
	All Vacant Private Acres	**3,055.7**	**2,088.8**	**966.9**
Persons Individual Residential	- CA Subtraction - Vacant	1,017.4	523.2	494.2
122.22 183.33	- Future Public Uses (including parks)	305.5	276.6	28.9
5%	- Other Public Uses	86.6	64.5	22.2
28.8%	- Infrastructure Subtraction SF	210.4	202.0	8.4
15.0%	- Infrastructure Subtraction MF	48.9	30.3	18.6
10.0%	- Infrastructure Subtraction Comm/Ind	59.0	32.1	26.9
15%	- Market Factor Subtraction- Vacant Residential	119.6	100.7	18.9
15%	- Market Factor Subtraction - Vacant Comm/Ind	79.6	43.3	36.3
	Net Developable Vacant Acres (Residential)	677.6	570.5	107.1
	Net Developable Vacant Acres (Comm/Ind)	451.2	245.6	205.5
	Net Developable Vacant Acres	**1,128.7**	**816.1**	**312.6**
	All Partially-Used and Under-Utilized Acres (PU, UU)	**2,360.9**	**1,307.5**	**1,053.4**
Persons Individual Residential	CA Subtraction - PU, UU	490.0	222.5	267.6
112.18 168.27	- Future Public Uses (including parks)	280.5	211.3	69.1
5%	- Other Public Uses	79.5	43.7	35.8
28.8%	- Infrastructure Subtraction SF	229.4	120.5	108.9
15.0%	- Infrastructure Subtraction MF	25.2	25.2	-
10.0%	- Infrastructure Subtraction Comm/Ind	54.7	24.4	30.3
25%	- Market Factor Subtraction- PU/UU Residential	177.4	110.1	67.3
25%	- Market Factor Subtraction - PU/UU Comm/Ind	123.0	54.9	68.1
	Net Developable PU, UU Acres (Residential)	532.3	330.4	201.9
	Net Developable PU, UU Acres (Comm/Ind)	369.0	164.6	204.4
	Net Developable PU, UU Acres	**901.3**	**495.0**	**406.3**
	Total Net Developable Acres (Vacant, PU, UU)	**2,030.0**	**1,311.1**	**718.9**
	Overall Market Factor (excluding master plan areas)	**19.8%**		

Residential: Population Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Residential Acres (Vacant, PU, UU)	**1,209.9**	**900.9**	**309.0**
	Overall Assumed Density (DU/Ac)	7.15	7.57	5.91
	Subtotal: DU Capacity (Vacant, PU, UU)	8,648	6,822	1,826
	+ Approved DU's - Master Plan Areas	9,143	9,044	99
	- Market Factor Subtraction - Master Plan Areas	2,042	2,027	15
	- Existing DU (including displaced in C/I and pending)	1,629	1,155	474
	+ Pending DU (approved DU's for pending projects)	3,003	3,003	-
varies	- Market Factor Subtr. for Pending DU's (if any)	-	-	-
	Subtotal DU Capacity	**17,123**	**15,687**	**1,436**
96.00%	x Occupancy Rate = SF Occupied DU's	5,219	4,130	1,089
2.49	x Avg Household Size = SF Population Capacity	12,995	10,283	2,712
92.75%	x Occupancy Rate = MF Occupied DU's	10,628	10,348	280
1.86	x Avg Household Size = MF Population Capacity	20,011	19,490	520
	Total Population Growth Capacity	**33,006**	**29,773.2**	**3,232.5**
	Allocated Population Growth	31,050		
	Capacity Surplus (Shortage)	1,956		
	SF DU Capacity	5,890	4,755	1,135
	MF DU Capacity	11,234	10,932	302

Commercial and Industrial: Employment Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Comm/Ind Acres (Vacant, PU, UU)	**820.1**	**410.2**	**409.9**
0.4	x Assumed FAR = FA Commercial (in SqFt)	7,924,100	7,146,983	777,117
0.25	x Assumed FAR = FA Industrial (in SqFt)	4,443,045	98,595	4,344,450
	Subtotal: FA Capacity (Vacant, PU, UU)	12,367,145	7,245,578	5,121,567
	+ Approved Comm/Ind SqFt - Master Plan Areas	7,053,550	7,053,550	-
varies	- Market Factor Subtraction - Master Plan Areas	1,915,936	1,915,936	-
	- Existing FA SqFt	1,832,302	777,127	1,055,175
	+ Pending FA SqFt (approved FA for pending projects)	3,547,384	511,800	3,035,584
	- Market Factor Subtr. For Pending SqFt (if any)	-	-	-
	Subtotal - FA Capacity	**19,219,841**	**12,117,865**	**7,101,976**
95%	x Occupancy Rate = Comm. Occupied FA	12,183,889	10,699,138	1,484,751
626	/ Employment Density = Comm. Job Capacity	19,463	17,091	2,372
95%	x Occupancy Rate = Ind. Occupied FA	6,074,960	812,834	5,262,126
775	/ Employment Density = Ind. Job Capacity	7,839	1,049	6,790
	Total Employment Growth Capacity	**27,302**	**18,140**	**9,162**
	Allocated Employment Growth	22,641		
	Capacity Surplus (Shortage)	4,661		

Land Capacity Analysis Summary
Birch Bay UGA

Net Developable Land Estimate

Assumptions		All County Zones
	Total Parcel Acres	**3,328.0**
	- Fully Developed Private Acres	1,011.7
	- Publicly Owned Vacant Acres	236.3
	- Publicly Owned Developed Acres	291.2
	- Quasi Public Developed Acres	338.1
	- Pending Project Acres (approved DU's added below)	189.6
	- Master Plan Acres (approved DU's added below)	0.0
	Remainder - all Vacant, PU, and UU Acres	**1,261.1**
	All Vacant Private Acres	**992.0**
	- CA Subtraction - Vacant	241.4
	- Future Public Uses (including parks)	0.0
5%	- Other Public Uses	37.5
33.7%	- Infrastructure Subtraction SF	179.7
27.3%	- Infrastructure Subtraction MF	31.2
10.0%	- Infrastructure Subtraction Comm/Ind	6.6
15%	- Market Factor Subtraction- Vacant Residential	65.5
15%	- Market Factor Subtraction - Vacant Comm/Ind	8.9
	Net Developable Vacant Acres (Residential)	371.1
	Net Developable Vacant Acres (Comm/Ind)	50.2
	Net Developable Vacant Acres	**421.3**
	All Partially-Used and Under-Utilized Acres (PU, UU)	**269.2**
	CA Subtraction - PU, UU	39.9
	- Future Public Uses (including parks)	0.0
5%	- Other Public Uses	11.5
33.7%	- Infrastructure Subtraction SF	51.0
27.3%	- Infrastructure Subtraction MF	12.4
10.0%	- Infrastructure Subtraction Comm/Ind	2.1
25%	- Market Factor Subtraction - PU/UU Residential	33.4
25%	- Market Factor Subtraction - PU/UU Comm/Ind	4.7
	Net Developable PU, UU Acres (Residential)	100.1
	Net Developable PU, UU Acres (Comm/Ind)	14.1
	Net Developable PU, UU Acres	**114.2**
	Total Net Developable Acres (Vacant, PU, UU)	**535.5**
	Overall Market Factor	**17.4%**

Residential: Population Growth Capacity Estimate

		All County Zones
	Net Developable Residential Acres (Vacant, PU, UU)	**471.2**
	Overall Assumed Density (DU/Ac)	7.61
	Subtotal: DU Capacity (Vacant, PU, UU)	3,585
	+ Approved DU's - Master Plan Areas	-
0%	- Market Factor Subtraction - Master Plan Areas	-
	- Existing DU (including displaced in C/I and pending)	291
	+ Pending DU (approved DU's for pending projects)	419
	- Market Factor Subtr. for Pending DU's (if any)	-
	Subtotal DU Capacity	**3,713**
74.40%	x Occupancy Rate = SF Occupied DU's	1,840
2.286	x Avg Household Size = SF Population Capacity	4,206
51.00%	x Occupancy Rate = MF Occupied DU's	632
1.65	x Avg Household Size = MF Population Capacity	1,044
	Total Population Growth Capacity	**5,250**
	Allocated Population Growth	5,282
	Capacity Surplus (Shortage)	(32)
	DU Capacity, Single Family	2,473
	DU Capacity, Multi Family	1,240

Commercial and Industrial: Employment Growth Capacity Estimate

		All County Zones
	Net Developable Comm/Ind Acres (Vacant, PU, UU)	**64.3**
0.161	x Assumed FAR = FA Commercial (in SqFt)	450,685
0.165	x Assumed FAR = FA Industrial (in SqFt)	-
	Subtotal: FA Capacity (Vacant, PU, UU)	450,685
	+ Approved Comm/Ind SqFt - Master Plan Areas	-
	- Market Factor Subtraction - Master Plan Areas	-
	- Existing FA SqFt	62,756
	+ Pending FA SqFt (approved FA for pending projects)	-
	- Market Factor Subtr. For Pending SqFt (if any)	-
	Subtotal - FA Capacity	**387,929**
95%	x Occupancy Rate = Comm. Occupied FA	368,533
626.0	/ Employment Density = Comm. Job Capacity	589
95%	x Occupancy Rate = Ind. Occupied FA	-
775.0	/ Employment Density = Ind. Job Capacity	-
	Total Employment Growth Capacity	**589**
	Allocated Employment Growth	545
	Capacity Surplus (Shortage)	44

Land Capacity Analysis Summary
Blaine UGA

Net Developable Land Estimate

			All UGA	All City Zones	All County Zones
		Total Parcel Acres	**3,554.8**	**3,083.0**	**471.8**
Assumptions		- Fully Developed Private Acres	652.1	618.6	33.5
		- Publicly Owned Vacant Acres	39.8	39.8	-
		- Publicly Owned Developed Acres	311.3	248.6	62.7
		- Quasi Public Developed Acres	245.5	244.2	1.3
		- Pending Project Acres (approved DU's added below)	146.1	146.1	-
		- Master Plan Acres (approved DU's added below)	684.7	684.7	-
		Remainder - all Vacant, PU, and UU Acres	**1,475.2**	**1,101.0**	**374.2**
		All Vacant Private Acres	**961.0**	**835.0**	**126.1**
		- CA Subtraction - Vacant	154.4	114.0	40.5
		- Future Public Uses (including parks)	-	0.0	-
5%		- Other Public Uses	40.3	36.0	4.3
32.6%		- Infrastructure Subtraction SF	214.6	192.6	21.9
19.8%		- Infrastructure Subtraction MF	4.0	4.0	-
10.0%		- Infrastructure Subtraction Comm/Ind	8.8	7.4	1.4
15%	70%	- Market Factor Subtraction- Vacant Residential	195.3	188.5	6.8
15%		- Market Factor Subtraction - Vacant Comm/Ind	11.9	10.0	1.9
		Net Developable Vacant Acres (Residential)	264.3	225.8	38.5
		Net Developable Vacant Acres (Comm/Ind)	67.4	56.7	10.8
		Net Developable Vacant Acres	**331.8**	**282.5**	**49.3**
		All Partially-Used and Under-Utilized Acres (PU, UU)	**514.1**	**266.0**	**248.1**
		CA Subtraction - PU, UU	69.5	14.9	54.6
		- Future Public Uses (including parks)	-	0.0	-
5%		- Other Public Uses	22.2	12.6	9.7
32.6%		- Infrastructure Subtraction SF	118.8	66.4	52.4
19.8%		- Infrastructure Subtraction MF	0.2	0.2	-
10.0%		- Infrastructure Subtraction Comm/Ind	5.7	3.4	2.3
25%	70%	- Market Factor Subtraction- PU/UU Residential	113.4	86.3	27.1
25%		- Market Factor Subtraction - PU/UU Comm/Ind	12.8	7.7	5.2
		Net Developable PU, UU Acres (Residential)	132.9	51.6	81.3
		Net Developable PU, UU Acres (Comm/Ind)	38.5	23.0	15.5
		Net Developable PU, UU Acres	**171.4**	**74.6**	**96.8**
		Total Net Developable Acres (Vacant, PU, UU)	**503.2**	**357.1**	**146.1**
		Overall Market Factor (excluding master planned areas)	**39.9%**		

Residential: Population Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Residential Acres (Vacant, PU, UU)	**397.3**	**277.4**	**119.9**
	Overall Assumed Density (DU/Ac)	4.71	4.05	6.22
	Subtotal: DU Capacity (Vacant, PU, UU)	1,870	1,124.8	746
	+ Approved DU's - Master Plan Areas	1,836	1,836.0	-
50%	- Market Factor Subtraction - Master Plan Areas	918	918.0	-
	- Existing DU (including displaced in C/I and pending)	179	121.0	58
	+ Pending DU (approved DU's for pending projects)	543	543.0	-
varies	- Market Factor Subtr. for Pending DU's (if any)	-	-	-
	Subtotal DU Capacity	**3,152**	**2,464.8**	**688**
85.52%	x Occupancy Rate = SF Occupied DU's	2,266	1,753.1	513
2.47	x Avg Household Size = SF Population Capacity	5,596	4,330.1	1,266
83.13%	x Occupancy Rate = MF Occupied DU's	418	344.9	73
2.03	x Avg Household Size = MF Population Capacity	849	700.2	149
	Total Population Growth Capacity	**6,445**	**5,030.3**	**1,415**
	Allocated Population Growth	4,414		
	Capacity Surplus (Shortage)	2,031		
	DU Capacity, Single Family	2,649	2,050	599
	DU Capacity, Multi Family	503	415	88

Commercial and Industrial: Employment Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Comm/Ind Acres (Vacant, PU, UU)	**105.9**	**79.7**	**26.3**
0.2	x Assumed FAR = FA Commercial (in SqFt)	147,761	147,760.8	-
0.3	x Assumed FAR = FA Industrial (in SqFt)	1,372,175	1,029,099.5	343,075.2
	Subtotal: FA Capacity (Vacant, PU, UU)	1,519,936	1,176,860.3	343,075.2
	+ Approved Comm/Ind SqFt - Master Plan Areas	-	-	-
	- Market Factor Subtraction - Master Plan Areas	-	-	-
	- Existing FA SqFt	47,650	47,650.0	-
	+ Pending FA SqFt (approved FA for pending projects)	594,340	594,340.0	-
	- Market Factor Subtr. For Pending SqFt (if any)	-	-	-
	Subtotal - FA Capacity	**2,066,626**	**1,723,550.3**	**343,075.2**
95%	x Occupancy Rate = Comm. Occupied FA	502,091	502,091.3	-
626	/ Employment Density = Comm. Job Capacity	802	802.1	-
95%	x Occupancy Rate = Ind. Occupied FA	1,461,203	1,135,281.6	325,921.4
775	/ Employment Density = Ind. Job Capacity	1,885	1,464.9	420.5
	Total Employment Growth Capacity	**2,687**	**2,266.9**	**420.5**
	Allocated Employment Growth	2,097		
	Capacity Surplus (Shortage)	590		

Land Capacity Analysis Summary
Cherry Point UGA

Net Developable Land Estimate

Assumptions		All County Zones
	Total Parcel Acres	6,912.5
	- Fully Developed Private Acres	2,181.4
	- Publicly Owned Vacant Acres	188.0
	- Publicly Owned Developed Acres	0.7
	- Quasi Public Developed Acres	95.4
	- Pending Project Acres (approved DU's added below)	-
	- Other Undevelopable Acres	392.4
	Remainder - all Vacant, PU, and UU Acres	**4,054.7**
	All Vacant Private Acres	**3,626.5**
	- CA Subtraction - Vacant	2,342.2
	- Future Public Uses (including parks)	-
5%	- Other Public Uses	64.2
0.0%	- Infrastructure Subtraction SF	-
0.0%	- Infrastructure Subtraction MF	-
10.0%	- Infrastructure Subtraction Comm/Ind	122.0
15%	- Market Factor Subtraction- Vacant Residential	-
15%	- Market Factor Subtraction - Vacant Comm/Ind	164.7
	Net Developable Vacant Acres (Residential)	-
	Net Developable Vacant Acres (Comm/Ind)	933.4
	Net Developable Vacant Acres	**933.4**
	All Partially-Used and Under-Utilized Acres (PU, UU)	**428.1**
	CA Subtraction - PU, UU	211.0
	- Future Public Uses (including parks)	-
5%	- Other Public Uses	10.9
0.0%	- Infrastructure Subtraction SF	-
0.0%	- Infrastructure Subtraction MF	-
10.0%	- Infrastructure Subtraction Comm/Ind	20.6
25%	- Market Factor Subtraction- PU/UU Residential	-
25%	- Market Factor Subtraction - PU/UU Comm/Ind	46.4
	Net Developable PU, UU Acres (Residential)	-
	Net Developable PU, UU Acres (Comm/Ind)	139.2
	Net Developable PU, UU Acres	**139.2**
	Total Net Developable Acres (Vacant, PU, UU)	**1,072.6**
	Overall Market Factor	**16.4%**

Residential: Population Growth Capacity Estimate

		All County Zones
	Net Developable Residential Acres (Vacant, PU, UU)	0.0
	Assumed Density (SqFt/DU)	
	Assumed Density (DU/Ac)	
	Subtotal: DU Capacity (Vacant, PU, UU)	
	+ Approved DU's - Master Plan Areas	
	- Market Factor Subtraction - Master Plan Areas	
	- Existing DU (including displaced in C/I and pending)	9
	+ Pending DU (approved DU's for pending projects)	
	- Market Factor Subtr. for Pending DU's (if any)	
	Subtotal DU Capacity	(9)
95.24%	x Occupancy Rate = SF Occupied DU's	(9)
2.85	x Avg Household Size = SF Population Capacity	(24)
93.97%	x Occupancy Rate = MF Occupied DU's	
2.31	x Avg Household Size = MF Population Capacity	
	Total Population Growth Capacity	(24)
	Allocated Population Growth	-
	Capacity Surplus (Shortage)	(24)

Commercial and Industrial: Employment Growth Capacity Estimate

		All County Zones
	Net Developable Comm/Ind Acres (Vacant, PU, UU)	1,072.6
0	x Assumed FAR = FA Commercial (in SqFt)	-
0.075	x Assumed FAR = FA Industrial (in SqFt)	3,504,206.5
	Subtotal: FA Capacity (Vacant, PU, UU)	3,504,206.5
	+ Approved Comm/Ind SqFt - Master Plan Areas	-
	- Market Factor Subtraction - Master Plan Areas	-
	- Existing FA SqFt	30,624.0
	+ Pending FA SqFt (approved FA for pending projects)	28,861.0
	- Market Factor Subtr. For Pending SqFt (if any)	-
	Subtotal - FA Capacity	**3,502,443.5**
95%	x Occupancy Rate = Comm. Occupied FA	-
0	/ Employment Density = Comm. Job Capacity	-
95%	x Occupancy Rate = Ind. Occupied FA	3,327,321.3
3500	/ Employment Density = Ind. Job Capacity	950.7
	Total Employment Growth Capacity	951
	Allocated Employment Growth	890
	Capacity Surplus (Shortage)	61

Land Capacity Analysis Summary
Columbia Valley UGA

Net Developable Land Estimate

Assumptions		All County Zones
	Total Parcel Acres	**980.2**
	- Fully Developed Private Acres	353.3
	- Publicly Owned Vacant Acres	6.3
	- Publicly Owned Developed Acres	13.7
	- Quasi Public Developed Acres	52.6
	- Other Undevelopable	53.9
	- Pending Project Acres (approved DU's added b	0.0
	- Master Plan Acres (approved DU's added below	0.0
	Remainder - all Vacant, PU, and UU Acres	**480.4**
	All Vacant Private Acres	455.5
	- CA Subtraction - Vacant	103.3
	- Future Public Uses (including parks)	17.5
5%	- Other Public Uses	16.7
33.7%	- Infrastructure Subtraction SF	90.0
27.3%	- Infrastructure Subtraction MF	0.5
10.0%	- Infrastructure Subtraction Comm/Ind	4.9
15%	- Market Factor Subtraction- Vacant Residential	26.7
15%	- Market Factor Subtraction - Vacant Comm/Ind	6.6
	Net Developable Vacant Acres (Residential)	151.6
	Net Developable Vacant Acres (Comm/Ind)	37.6
	Net Developable Vacant Acres	**189.2**
	All Partially-Used and Under-Utilized Acres (PU, UU	**25.0**
	CA Subtraction - PU, UU	7.5
	- Future Public Uses (including parks)	0.0
5%	- Other Public Uses	0.9
33.7%	- Infrastructure Subtraction SF	4.4
27.3%	- Infrastructure Subtraction MF	0.1
10.0%	- Infrastructure Subtraction Comm/Ind	0.3
25%	- Market Factor Subtraction- PU/UU Residential	2.2
25%	- Market Factor Subtraction - PU/UU Comm/Ind	0.7
	Net Developable PU, UU Acres (Residential)	6.7
	Net Developable PU, UU Acres (Comm/Ind)	2.1
	Net Developable PU, UU Acres	**8.8**
	Total Net Developable Acres (Vacant, PU, UU)	**198.0**
	Overall Market Factor	**15.5%**

Residential: Population Growth Capacity Estimat

		All County Zones
	Net Developable Residential Acres (Vacant, PU, UU	**158.3**
	Overall Assumed Density (DU/Ac)	4.0
	Subtotal: DU Capacity (Vacant, PU, UU)	633
	+ Approved DU's - Master Plan Areas	-
	- Market Factor Subtraction - Master Plan Areas	-
	- Existing DU (including displaced in C/I and pend	6
	+ Pending DU (approved DU's for pending projec	-
	- Market Factor Subtr. for Pending DU's (if any)	-
	Subtotal DU Capacity	**627**
78.42%	x Occupancy Rate = SF Occupied DU's	489
2.8	x Avg Household Size = SF Population Capacity	1,368
78.42%	x Occupancy Rate = MF Occupied DU's	3
2.8	x Avg Household Size = MF Population Capacity	9
	Total Population Growth Capacity	**1,377**
	Allocated Population Growth	1,345
	Capacity Surplus (Shortage)	32

Commercial and Industrial: Employment Growth

		All County Zones
	Net Developable Comm/Ind Acres (Vacant, PU, UU)	**39.7**
0.161	x Assumed FAR = FA Commercial (in SqFt)	100,749
0.165	x Assumed FAR = FA Industrial (in SqFt)	182,139
	Subtotal: FA Capacity (Vacant, PU, UU)	282,889
	+ Approved Comm/Ind SqFt - Master Plan Areas	-
	- Market Factor Subtraction - Master Plan Areas	-
	- Existing FA SqFt	-
	+ Pending FA SqFt (approved FA for pending pro	-
	- Market Factor Subtr. For Pending SqFt (if any)	-
	Subtotal - FA Capacity	**282,889**
95%	x Occupancy Rate = Comm. Occupied FA	95,712
626	/ Employment Density = Comm. Job Capacity	153
95%	x Occupancy Rate = Ind. Occupied FA	173,032
775	/ Employment Density = Ind. Job Capacity	223
	Total Employment Growth Capacity	**376**
	Allocated Employment Growth	359
	Capacity Surplus (Shortage)	17

Land Capacity Analysis Summary
Everson UGA

		Net Developable Land Estimate	All UGA	All City Zones	All County Zones
		Total Parcel Acres	**1,076.5**	**725.9**	**350.6**
Assumptions		- Fully Developed Private Acres	292.5	271.8	20.7
		- Publicly Owned Vacant Acres	53.0	37.6	15.4
		- Publicly Owned Developed Acres	34.7	34.7	-
		- Quasi Public Developed Acres	71.5	53.0	18.5
		- Pending Project Acres (approved DU's added below)	35.9	35.9	-
		- Other Undevelopable	0.8	0.8	-
		Remainder - all Vacant, PU, and UU Acres	**588.1**	**292.1**	**296.0**
		All Vacant Private Acres	**283.8**	**182.1**	**101.7**
		- CA Subtraction - Vacant	100.3	53.9	46.4
		- Future Public Uses (including parks)	1.5	1.5	-
5%		- Other Public Uses	9.1	6.3	2.8
29.0%	15%	- Infrastructure Subtraction SF	14.9	10.8	4.1
25.0%		- Infrastructure Subtraction MF	0.9	0.9	-
15.0%	20%	- Infrastructure Subtraction Comm/Ind	23.0	15.4	7.6
15%	70%	- Market Factor Subtraction- Vacant Residential	20.2	18.7	1.5
15%		- Market Factor Subtraction - Vacant Comm/Ind	14.1	9.5	4.6
		Net Developable Vacant Acres (Residential)	20.0	11.5	8.5
		Net Developable Vacant Acres (Comm/Ind)	79.9	53.7	26.2
		Net Developable Vacant Acres	**99.9**	**65.2**	**34.7**
		All Partially-Used and Under-Utilized Acres (PU, UU)	**304.3**	**110.0**	**194.3**
		CA Subtraction - PU, UU	71.5	9.2	62.2
		- Future Public Uses (including parks)	-	-	-
5%		- Other Public Uses	11.6	5.0	6.6
29.0%		- Infrastructure Subtraction SF	42.9	21.5	21.4
25.0%		- Infrastructure Subtraction MF	1.4	1.4	-
15.0%		- Infrastructure Subtraction Comm/Ind	10.1	2.4	7.7
25%	70%	- Market Factor Subtraction- PU/UU Residential	29.4	16.3	13.1
25%		- Market Factor Subtraction - PU/UU Comm/Ind	14.3	3.4	10.9
		Net Developable PU, UU Acres (Residential)	79.9	40.5	39.4
		Net Developable PU, UU Acres (Comm/Ind)	43.0	10.2	32.8
		Net Developable PU, UU Acres	**123.0**	**50.8**	**72.2**
		Total Net Developable Acres (Vacant, PU, UU)	**222.8**	**115.9**	**106.9**
		Overall Market Factor	**25.9%**		

Residential: Population Growth Capacity Estimate

			All UGA	All City Zones	All County Zones
		Net Developable Residential Acres (Vacant, PU, UU)	**99.9**	**52.0**	**47.9**
		Assumed Density (DU/Ac)	4.01	4.01	4.00
		Subtotal: DU Capacity (Vacant, PU, UU)	400	209	192
		+ Approved DU's - Master Plan Areas	-	-	-
		- Market Factor Subtraction - Master Plan Areas	-	-	-
		- Existing DU (including displaced in C/I and pending)	76	49	27
		+ Pending DU (approved DU's for pending projects)	120	120	-
		- Market Factor Subtr. for Pending DU's (if any)	-	-	-
		Subtotal DU Capacity	**444**	**280**	**165**
96.45%		x Occupancy Rate = SF Occupied DU's	410	251	159
3.06		x Avg Household Size = SF Population Capacity	1,255	769	486
90.63%		x Occupancy Rate = MF Occupied DU's	17	17	-
2.93		x Avg Household Size = MF Population Capacity	51	51	-
		Total Population Growth Capacity	**1,305**	**820**	**486**
		Allocated Population Growth	1,242		
		Capacity Surplus (Shortage)	63		
		DU Capacity, Single Family	453	280	174
		DU Capacity, Multi Family	19	19	-

Commercial and Industrial: Employment Growth Capacity Estimate

			All UGA	All City Zones	All County Zones
		Net Developable Comm/Ind Acres (Vacant, PU, UU)	**122.9**	**63.9**	**59.0**
0.2		x Assumed FAR = FA Commercial (in SqFt)	210,972	68,108.6	142,863.4
0.3		x Assumed FAR = FA Industrial (in SqFt)	1,289,694	733,024.4	556,669.5
		Subtotal: FA Capacity (Vacant, PU, UU)	1,500,666	801,133.0	699,532.8
		+ Approved Comm/Ind SqFt - Master Plan Areas	-	-	-
		- Market Factor Subtraction - Master Plan Areas	-	-	-
		- Existing FA SqFt	114,036	23,720.0	90,316.0
		+ Pending FA SqFt (approved FA for pending projects)	-	-	-
		- Market Factor Subtr. For Pending SqFt (if any)	-	-	-
		Subtotal - FA Capacity	**1,386,630**	**777,413.0**	**609,216.8**
95%		x Occupancy Rate = Comm. Occupied FA	163,088	62,423.2	100,665.2
900		/ Employment Density = Comm. Job Capacity	181	69.4	111.9
95%		x Occupancy Rate = Ind. Occupied FA	1,154,210	676,119.1	478,090.8
2000		/ Employment Density = Ind. Job Capacity	577	338.1	239.0
		Total Employment Growth Capacity	**758**	**407.4**	**350.9**
		Allocated Employment Growth	602		
		Capacity Surplus (Shortage)	156		

Land Capacity Analysis Summary
Ferndale UGA

	Net Developable Land Estimate	All UGA	All City Zones	All County Zones
	Total Parcel Acres	**5,039.9**	**3,726.9**	**1,313.0**
Assumptions	- Fully Developed Private Acres	1,521.9	1,271.7	250.2
	- Publicly Owned Vacant Acres	184.7	143.2	41.5
	- Publicly Owned Developed Acres	322.0	322.0	-
	- Quasi Public Developed Acres	306.5	295.9	10.6
	- Other Undevelopable	8.8	8.8	
	- Pending Project Acres (approved DU's added b	277.9	277.9	-
	- Master Plan Acres (approved DU's added below	-	-	-
	Remainder - all Vacant, PU, and UU Acres	**2,418.1**	**1,407.4**	**1,010.7**
	All Vacant Private Acres	**1,225.8**	**850.9**	**374.9**
	- CA Subtraction - Vacant	473.8	368.0	105.8
4.88	- Future Public Uses (including parks)	14.2	12.4	1.7
5%	- Other Public Uses	36.9	23.5	13.4
31.34%	- Infrastructure Subtraction SF	82.6	32.5	50.1
31.34%	- Infrastructure Subtraction MF	8.9	8.9	-
10.00%	- Infrastructure Subtraction Comm/Ind	40.9	31.5	9.4
15%	- Market Factor Subtraction- Vacant Residential	30.1	13.6	16.5
15%	- Market Factor Subtraction - Vacant Comm/Ind	55.2	42.5	12.7
	Net Developable Vacant Acres (Residential)	170.3	77.1	93.3
	Net Developable Vacant Acres (Comm/Ind)	312.9	240.9	72.0
	Net Developable Vacant Acres	**483.3**	**318.0**	**165.3**
	All Partially-Used and Under-Utilized Acres (PU, UU	**1,192.3**	**556.5**	**635.8**
	CA Subtraction - PU, UU	249.1	115.0	134.1
6.12	- Future Public Uses (including parks)	17.8	14.5	3.3
5%	- Other Public Uses	46.3	21.3	24.9
31.34%	- Infrastructure Subtraction SF	180.2	55.4	124.8
31.34%	- Infrastructure Subtraction MF	10.9	10.9	-
10.00%	- Infrastructure Subtraction Comm/Ind	26.9	19.4	7.5
25%	- Market Factor Subtraction- PU/UU Residential	104.7	36.3	68.4
25%	- Market Factor Subtraction - PU/UU Comm/Ind	60.6	43.6	16.9
	Net Developable PU, UU Acres (Residential)	314.1	109.0	205.1
	Net Developable PU, UU Acres (Comm/Ind)	181.7	130.9	50.8
	Net Developable PU, UU Acres	**495.8**	**239.9**	**255.9**
	Total Net Developable Acres (Vacant, PU, UU)	**979.0**	**557.8**	**421.2**
	Overall Market Factor	**20.4%**		

Residential: Population Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Residential Acres (Vacant, PU, UU	**484.4**	**186.1**	**298.4**
	Overall Assumed Density (DU/Ac)	5.01	6.40	4.15
	Subtotal: DU Capacity (Vacant, PU, UU)	2,428	1,190	1,238
	+ Approved DU's - Master Plan Areas	-	-	-
	- Market Factor Subtraction - Master Plan Areas	-	-	-
	- Existing DU (including displaced in C/I and pend	588	480	108
	+ Pending DU (approved DU's for pending projec	651	651	-
	- Market Factor Subtr. for Pending DU's (if any)	-	-	-
	Subtotal DU Capacity	2,491	1,361	1,130
95.24%	x Occupancy Rate = SF Occupied DU's	1,981	905	1,076
2.85	x Avg Household Size = SF Population Capacity	5,646	2,579	3,067
93.97%	x Occupancy Rate = MF Occupied DU's	386	386	-
2.31	x Avg Household Size = MF Population Capacity	893	893	-
	Total Population Growth Capacity	**6,538**	**3,471**	**3,067**
	Allocated Population Growth	6,833		
	Capacity Surplus (Shortage)	(295)		
	DU Capacity, Single Family	2,080	950	1,130
	DU Capacity, Multi Family	411	411	

Commercial and Industrial: Employment Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Comm/Ind Acres (Vacant, PU, UU)	**494.6**	**371.8**	**122.8**
0.161	x Assumed FAR = FA Commercial (in SqFt)	2,732,769	2,048,967.1	683,801.9
0.165	x Assumed FAR = FA Industrial (in SqFt)	857,887	675,998.7	181,888.1
	Subtotal: FA Capacity (Vacant, PU, UU)	3,590,656	2,724,965.8	865,689.9
	+ Approved Comm/Ind SqFt - Master Plan Areas	-	-	-
	- Market Factor Subtraction - Master Plan Areas	-	-	-
	- Existing FA SqFt	268,887	251,443.0	17,444.0
	+ Pending FA SqFt (approved FA for pending pro	559,869	559,869.0	-
	- Market Factor Subtr. For Pending SqFt (if any)	-	-	-
	Subtotal - FA Capacity	**3,571,894**	**2,723,647.8**	**848,245.9**
95%	x Occupancy Rate = Comm. Occupied FA	2,687,397	2,052,407.3	634,989.4
870	/ Employment Density = Comm. Job Capacity	3,090	2,360.1	729.9
95%	x Occupancy Rate = Ind. Occupied FA	705,902	535,058.1	170,844.3
1,071	/ Employment Density = Ind. Job Capacity	659	499.6	159.5
	Planned Employees for Pending Projects	58	58.0	-
	Total Employment Growth Capacity	**3,807**	**2,917.6**	**889.4**
	Allocated Employment Growth	4,000		
	Capacity Surplus (Shortage)	(193)		

Land Capacity Analysis Summary
Lynden UGA

	Net Developable Land Estimate	All UGA	All City Zones	All County Zones
	Total Parcel Acres	**3,638.5**	**2,890.3**	**748.1**
Assumptions	- Fully Developed Private Acres	1,362.3	1,339.3	23.0
	- Publicly Owned Vacant Acres	61.4	48.5	13.0
	- Publicly Owned Developed Acres	285.9	250.3	35.6
	- Quasi Public Developed Acres	327.5	327.5	-
	- Pending Project Acres (approved DU's added below)	24.5	24.5	-
	- Master Plan Acres (approved DU's added below)	-	-	-
	Remainder - all Vacant, PU, and UU Acres	**1,576.8**	**900.3**	**676.6**
	All Vacant Private Acres	**719.7**	**412.5**	**307.2**
	- CA Subtraction - Vacant	152.3	95.1	57.3
	- Future Public Uses (including parks)	-	-	-
5%	- Other Public Uses	28.4	15.9	12.5
25.7%	- Infrastructure Subtraction SF	67.6	24.3	43.3
26.0%	- Infrastructure Subtraction MF	9.1	8.9	0.2
10.0%	- Infrastructure Subtraction Comm/Ind	24.1	17.3	6.8
15%	- Market Factor Subtraction- Vacant Residential	33.2	14.3	18.9
15%	- Market Factor Subtraction - Vacant Comm/Ind	32.5	23.3	9.2
	Net Developable Vacant Acres (Residential)	188.2	81.3	106.9
	Net Developable Vacant Acres (Comm/Ind)	184.2	132.2	52.1
	Net Developable Vacant Acres	**372.4**	**213.4**	**159.0**
	All Partially-Used and Under-Utilized Acres (PU, UU)	**857.1**	**487.8**	**369.4**
	CA Subtraction - PU, UU	160.6	109.4	51.3
	- Future Public Uses (including parks)	-	-	-
5%	- Other Public Uses	34.8	18.9	15.9
25.7%	- Infrastructure Subtraction SF	69.7	41.5	28.2
26.0%	- Infrastructure Subtraction MF	29.9	8.0	21.9
10.0%	- Infrastructure Subtraction Comm/Ind	27.6	16.7	10.8
25%	- Market Factor Subtraction- PU/UU Residential	71.6	35.6	36.0
25%	- Market Factor Subtraction - PU/UU Comm/Ind	62.0	37.7	24.3
	Net Developable PU, UU Acres (Residential)	214.9	106.9	108.0
	Net Developable PU, UU Acres (Comm/Ind)	186.0	113.0	73.0
	Net Developable PU, UU Acres	**400.9**	**220.0**	**180.9**
	Total Net Developable Acres (Vacant, PU, UU)	**773.3**	**433.4**	**339.9**
	Overall Market Factor	**20.5%**		

Residential: Population Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Residential Acres (Vacant, PU, UU)	**403.1**	**188.2**	**214.9**
	Assumed Density (DU/Ac)	7.43	6.22	8.49
	Subtotal: DU Capacity (Vacant, PU, UU)	2,995	1,170	1,825
	+ Approved DU's - Master Plan Areas	-	-	-
	- Market Factor Subtraction - Master Plan Areas	-	-	-
	- Existing DU (including displaced in C/I and pending)	261	225	36
	+ Pending DU (approved DU's for pending projects)	130	130	-
	- Market Factor Subtr. for Pending DU's (if any)	-	-	-
	Subtotal DU Capacity	2,864	1,075	1,789
96.90%	x Occupancy Rate = SF Occupied DU's	1,593	548	1,044
2.88	x Avg Household Size = SF Population Capacity	4,587	1,579	3,008
91.92%	x Occupancy Rate = MF Occupied DU's	1,122	468	654
1.68	x Avg Household Size = MF Population Capacity	1,884	786	1,098
	Total Population Growth Capacity	**6,472**	**2,366**	**4,106**
	Allocated Population Growth	6,403		
	Capacity Surplus (Shortage)	69		
	DU Capacity, Single Family	1,644	566	1,078
	DU Capacity, Multi Family	1,220	509	711

Commercial and Industrial: Employment Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Comm/Ind Acres (Vacant, PU, UU)	370.2	245.2	125.1
0.161	x Assumed FAR = FA Commercial (in SqFt)	1,050,980	799,280.5	**251,699.8**
0.165	x Assumed FAR = FA Industrial (in SqFt)	1,583,959	943,036.9	640,922.3
	Subtotal: FA Capacity (Vacant, PU, UU)	2,634,939	1,742,317.4	892,622.1
	+ Approved Comm/Ind SqFt - Master Plan Areas	-	-	-
	- Market Factor Subtraction - Master Plan Areas	-	-	-
	- Existing FA SqFt	1,323,730	1,323,730.0	-
	+ Pending FA SqFt (approved FA for pending projects)	-	-	-
	- Market Factor Subtr. For Pending SqFt (if any)	-	-	-
	Subtotal - FA Capacity	**1,311,209**	**418,587.4**	**892,622.1**
95%	x Occupancy Rate = Comm. Occupied FA	283,020	43,905.6	239,114.8
626	/ Employment Density = Comm. Job Capacity	452	70.1	382.0
95%	x Occupancy Rate = Ind. Occupied FA	962,629	353,752.4	608,876.2
775	/ Employment Density = Ind. Job Capacity	1,242	456.5	785.6
	Total Employment Growth Capacity	**1,694**	**526.6**	**1,167.6**
	Allocated Employment Growth	2,157		
	Capacity Surplus (Shortage)	(463)		

Land Capacity Analysis Summary
Nooksack UGA

	Net Developable Land Estimate	All UGA	All City Zones	All County Zones
	Total Parcel Acres	**503.6**	**349.5**	**154.1**
Assumptions	- Fully Developed Private Acres	132.0	131.4	0.5
	- Publicly Owned Vacant Acres	6.8	0.6	6.2
	- Publicly Owned Developed Acres	35.1	15.9	19.2
	- Quasi Public Developed Acres	27.6	18.8	8.8
	- Pending Project Acres (approved DU's added below)	44.0	44.0	-
	- Other Undevelopable	19.7	19.7	-
	Remainder - all Vacant, PU, and UU Acres	**238.3**	**118.9**	**119.4**
	All Vacant Private Acres	**90.1**	**48.9**	**41.2**
	- CA Subtraction - Vacant	22.8	11.0	11.8
	- Future Public Uses (including parks)	-	-	-
5%	- Other Public Uses	3.4	1.9	1.5
30.0%	- Infrastructure Subtraction SF	13.3	10.0	3.3
30.0%	- Infrastructure Subtraction MF	-	-	-
15.0%	- Infrastructure Subtraction Comm/Ind	3.8	0.4	3.4
15%	- Market Factor Subtraction- Vacant Residential	4.7	3.5	1.1
15%	- Market Factor Subtraction - Vacant Comm/Ind	2.4	0.3	2.1
	Net Developable Vacant Acres (Residential)	26.4	19.9	6.5
	Net Developable Vacant Acres (Comm/Ind)	13.4	1.8	11.6
	Net Developable Vacant Acres	**39.8**	**21.7**	**18.1**
	All Partially-Used and Under-Utilized Acres (PU, UU)	**148.1**	**70.0**	**78.2**
	CA Subtraction - PU, UU	45.2	14.4	30.8
	- Future Public Uses (including parks)	-	-	-
5%	- Other Public Uses	5.1	2.8	2.4
30.0%	- Infrastructure Subtraction SF	22.4	12.4	10.1
30.0%	- Infrastructure Subtraction MF	-	-	-
15.0%	- Infrastructure Subtraction Comm/Ind	3.5	1.7	1.7
25%	- Market Factor Subtraction- PU/UU Residential	13.1	7.2	5.9
25%	- Market Factor Subtraction - PU/UU Comm/Ind	4.9	2.5	2.4
	Net Developable PU, UU Acres (Residential)	39.3	21.6	17.6
	Net Developable PU, UU Acres (Comm/Ind)	14.7	7.4	7.3
	Net Developable PU, UU Acres	**53.9**	**29.0**	**24.9**
	Total Net Developable Acres (Vacant, PU, UU)	**93.7**	**50.7**	**43.0**
	Overall Market Factor	**21.1%**		

Residential: Population Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Residential Acres (Vacant, PU, UU)	**65.6**	**41.5**	**24.1**
	Overall Assumed Density (DU/Ac)	4.39	4.40	4.38
	Subtotal: DU Capacity (Vacant, PU, UU)	288	183	105
	+ Approved DU's - Master Plan Areas	-	-	-
	- Market Factor Subtraction - Master Plan Areas	-	-	-
	- Existing DU (including displaced in C/I and pending)	43	33	10
	+ Pending DU (approved DU's for pending projects)	94	94	-
	- Market Factor Subtr. for Pending DU's (if any)	-	-	-
	Subtotal DU Capacity	339	244	95
95.19%	x Occupancy Rate = SF Occupied DU's	323	232	91
3.1	x Avg Household Size = SF Population Capacity	1,001	719	282
93.33%	x Occupancy Rate = MF Occupied DU's	-	-	-
3.14	x Avg Household Size = MF Population Capacity	-	-	-
	Total Population Growth Capacity	**1,001**	**719**	**282**
	Allocated Population Growth	990		
	Capacity Surplus (Shortage)	11		
	DU Capacity, Single Family	340	244	96
	DU Capacity, Multi Family	-	-	-

Commercial and Industrial: Employment Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Comm/Ind Acres (Vacant, PU, UU)	**28.1**	**9.2**	**18.9**
0.25	x Assumed FAR = FA Commercial (in SqFt)	79,899	72,830.5	7,068.8
0.10	x Assumed FAR = FA Industrial (in SqFt)	90,437	10,833.1	79,603.5
	Subtotal: FA Capacity (Vacant, PU, UU)	170,336	83,663.6	86,672.2
	+ Approved Comm/Ind SqFt - Master Plan Areas	-	-	-
	- Market Factor Subtraction - Master Plan Areas	-	-	-
	- Existing FA SqFt	8,792	8,792.0	-
	+ Pending FA SqFt (approved FA for pending projects)	-	-	-
	- Market Factor Subtr. For Pending SqFt (if any)	-	-	-
	Subtotal - FA Capacity	**161,544**	**74,871.6**	**86,672.2**
95%	x Occupancy Rate = Comm. Occupied FA	71,534	64,819.0	6,715.3
1,100	/ Employment Density = Comm. Job Capacity	65	58.9	6.1
95%	x Occupancy Rate = Ind. Occupied FA	81,932	6,309.1	75,623.3
2,000	/ Employment Density = Ind. Job Capacity	41	3.2	37.8
	Total Employment Growth Capacity	**106**	**62.1**	**43.9**
	Allocated Employment Growth	115		
	Capacity Surplus (Shortage)	(9)		

Land Capacity Analysis Summary
Sumas UGA

	Net Developable Land Estimate	All UGA	All City Zones	All County Zones
	Total Parcel Acres	**799.0**	**773.2**	**25.8**
Assumptions	- Fully Developed Private Acres	260.8	260.8	-
	- Publicly Owned Vacant Acres	12.4	12.4	-
	- Publicly Owned Developed Acres	65.1	65.1	-
	- Quasi Public Developed Acres	31.0	31.0	-
	- Pending Project Acres (approved DU's added below)	10.1	10.1	-
	- Other Undevelopable	20.4	20.4	-
	Remainder - all Vacant, PU, and UU Acres	**399.2**	**373.4**	**25.8**
	All Vacant Private Acres	**269.3**	**243.5**	**25.8**
	- CA Subtraction - Vacant	78.1	55.4	22.7
	- Future Public Uses (including parks)	-	-	-
5%	- Other Public Uses	9.6	9.4	0.2
15.0%	- Infrastructure Subtraction SF	5.3	5.3	-
25.0%	- Infrastructure Subtraction MF	6.6	6.6	-
10.0%	- Infrastructure Subtraction Comm/Ind	12.0	11.7	0.3
15%	- Market Factor Subtraction- Vacant Residential	7.5	7.5	-
15%	- Market Factor Subtraction - Vacant Comm/Ind	16.2	15.8	0.4
	Net Developable Vacant Acres (Residential)	42.4	42.4	-
	Net Developable Vacant Acres (Comm/Ind)	91.7	89.4	2.3
	Net Developable Vacant Acres	**134.1**	**131.8**	**2.3**
	All Partially-Used and Under-Utilized Acres (PU, UU)	**129.9**	**129.9**	-
	CA Subtraction - PU, UU	21.7	21.7	-
	- Future Public Uses (including parks)	-	-	-
5%	- Other Public Uses	5.4	5.4	-
15.0%	- Infrastructure Subtraction SF	6.4	6.4	-
25.0%	- Infrastructure Subtraction MF	5.2	5.2	-
10.0%	- Infrastructure Subtraction Comm/Ind	3.9	3.9	-
25%	- Market Factor Subtraction- PU/UU Residential	13.0	13.0	-
25%	- Market Factor Subtraction - PU/UU Comm/Ind	8.9	8.9	-
	Net Developable PU, UU Acres (Residential)	38.9	38.9	-
	Net Developable PU, UU Acres (Comm/Ind)	26.6	26.6	-
	Net Developable PU, UU Acres	**65.4**	**65.4**	-
	Total Net Developable Acres (Vacant, PU, UU)	**199.5**	**197.3**	**2.3**
	Overall Market Factor	**18.6%**		

Residential: Population Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Residential Acres (Vacant, PU, UU)	**81.3**	**81.3**	-
	Assumed Density (DU/Ac)	4.87	4.87	-
	Subtotal: DU Capacity (Vacant, PU, UU)	396	396	-
	+ Approved DU's - Master Plan Areas	-	-	-
	- Market Factor Subtraction - Master Plan Areas	-	-	-
	- Existing DU (including displaced in C/I and pending)	50	50	-
	+ Pending DU (approved DU's for pending projects)	29	29	-
	- Market Factor Subtr. for Pending DU's (if any)	-	-	-
	Subtotal DU Capacity	375	375	-
94.48%	x Occupancy Rate = SF Occupied DU's	173	173	-
2.89	x Avg Household Size = SF Population Capacity	499	499	-
90.57%	x Occupancy Rate = MF Occupied DU's	174	174	-
2.21	x Avg Household Size = MF Population Capacity	385	385	-
	Total Population Growth Capacity	**884**	**884**	**0.0**
	Allocated Population Growth	874		
	Capacity Surplus (Shortage)	10		
	DU Capacity, Single Family	183	183	-
	DU Capacity, Multi Family	192	192	-

Commercial and Industrial: Employment Growth Capacity Estimate

		All UGA	All City Zones	All County Zones
	Net Developable Comm/Ind Acres (Vacant, PU, UU)	118.2	116.0	2.3
0.22	x Assumed FAR = FA Commercial (in SqFt)	111,705	90,127.7	21,576.9
0.11	x Assumed FAR = FA Industrial (in SqFt)	510,572	510,571.8	-
	Subtotal: FA Capacity (Vacant, PU, UU)	622,276	600,699.4	21,576.9
	+ Approved Comm/Ind SqFt - Master Plan Areas	-	-	-
	- Market Factor Subtraction - Master Plan Areas	-	-	-
	- Existing FA SqFt	50,250	50,250.0	-
	+ Pending FA SqFt (approved FA for pending projects)	-	-	-
	- Market Factor Subtr. For Pending SqFt (if any)	-	-	-
	Subtotal - FA Capacity	572,026	550,449.4	21,576.9
95%	x Occupancy Rate = Comm. Occupied FA	106,119	85,621.3	20,498.1
629	/ Employment Density = Comm. Job Capacity	169	136.1	32.6
95%	x Occupancy Rate = Ind. Occupied FA	437,306	437,305.7	-
1,500	/ Employment Density = Ind. Job Capacity	292	291.5	-
	Total Employment Growth Capacity	**460**	**427.7**	**32.6**
	Allocated Employment Growth	445		
	Capacity Surplus (Shortage)	15		

Appendix B

LCA Detailed Methodology

SEPTEMBER 18, 2015

WHATCOM COUNTY LAND CAPACITY ANALYSIS

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1.0 INTRODUCTION

This document describes the detailed methodology used in Whatcom County's Land Capacity Analysis (LCA) as part of a process to review and revise Urban Growth Areas and update the Whatcom County Comprehensive Plan by June 2016.

2.0 GEOGRAPHIC AND TIME PARAMETERS

2.1 Base Point in Time

The City and County Planner Group, selected a base point in time, April 1, 2013, from which the developable lands inventory was measured. For the LCA, all structures existing as of April 1, 2013 will be considered developed, while everything else proposed, built or occupied after that date will be counted as future capacity. The Whatcom County Assessor's data used by the County will be taken from the same point in time. This common parameter ensures consistency across jurisdictions in processing property and building activity data. Significant changes in the data (i.e. new pending projects, revised development status of large parcels) may be incorporated into future iterations of the LCA up to adoption of the Comprehensive Plan update in 2016.

2.2 Study Area Boundaries

The Land Capacity Analysis was carried out for all UGAs and UGA Reserves in Whatcom County including both incorporated and unincorporated portions of each UGA. An analysis was done early in the comprehensive planning process using adopted UGA boundaries, and again when UGA boundary adjustments were proposed.

3.0 LAND INVENTORY

3.1 Assemble Gross Developable Land Inventory

The purpose of the assessment of land supply is to identify all lands within UGAs that are considered vacant, partially-used, or under-utilized. These lands comprise the Gross Developable Land Inventory.

Data Needed

- Whatcom County Assessor's Office countywide parcel data in shapefile format. Associated attribute data including improvement value and land value.
- GIS shapefiles from cities and the County including: 1) Boundaries for all County UGAs (existing and proposed) and incorporated cities and 2) Zoning for all jurisdictions and city comprehensive plan and future zoning designations for associated UGAs.
- Recent plat and permit activity data (see **Section 4.1**)

Steps

1. Identify and remove fully developed land from the inventory.
2. Select all residential, commercial, and industrial parcels within UGAs. Distinguish between those parcels in unincorporated areas and those within incorporated cities.
3. Cross-reference local permit and plat data with selected parcels. Separate any parcels with multifamily permits, commercial/industrial binding site plans, and preliminary and final plats that have not been constructed by April 1, 2013. This includes master planned projects that have not been completely built out but have received approval, as determined by the applicable jurisdiction, for a certain number of dwelling units or commercial/industrial square footage. Only projects that have received preliminary approval will be included in this list. These developments will be considered pending capacity and will be added to the final land capacity total at the end of the process. (see **Section 5.1**) In addition, there is the potential for significant commercial development on Lummi Nation Trust Land in the Bellingham and Ferndale UGAs near the Slater Road and I-5 interchange, which will not require approval from either city or the County. In order for the land capacity analysis to account for this development, the estimated square footage from the most recent conceptual plan will be considered pending square footage, with 70% of the square footage allocated to the Bellingham UGA and 30% to Ferndale.
4. If necessary, update any Assessor's parcel records that have not incorporated recent plat or permit data issued before April 1, 2013.
5. Select developable parcels that are vacant, partially-used, or under-utilized. Use GIS processes and database queries to apply the definitional thresholds listed in **Exhibit 1**.

Exhibit 1
Developable Land Definitional Thresholds

Category	Parcel Zoning	Definition
Vacant	All Residential, Commercial, Industrial	Improvement value < $10,000; exclude all parcels < 2,400 sq ft in size
Partially-Used	Single Family	Parcel size > 3 times minimum allowed under zoning[1]; Jurisdictions may propose to exclude parcels with current assessed improvement value > 93rd percentile[2] of jurisdiction improvement values if the parcel size is less than five acres
	Multifamily, Commercial, Industrial	1. Ratio between improvement value and land value < 1.0 2. Jurisdictions can identify existing development, such as gas stations or uses that preclude significant development on the site, as fully developed when the ratio of improvement value to land value is less than 1. If identified as fully developed, the parcel will be subtracted from the inventory.
Under-Utilized	Single Family	N/A
	Multifamily	Parcels occupied by nonconforming single-family residential uses
	Commercial and Industrial	Parcels occupied by nonconforming residential uses or other nonconforming uses.

6. Make adjustments for mobile homes. The primary concern is that some mobile home parks may show up as vacant if the mobile home value is not captured in the Assessor's improvement value data. County staff will use aerial imagery to truth check developable parcel designations against known areas with mobile home developments. Local jurisdictions will also be given an opportunity to review developable land and mobile home park issues in the local jurisdiction

[1] This threshold accounts for parcels less than three times the minimum size but due to parcel configuration are not likely to be divided to their maximum potential.

[2] The option to exclude parcels with high improvement values is meant to account for the fact that large single family parcels with high-end homes are unlikely to be subdivided. The 93rd percentile threshold was determined by analyzing the distribution of housing values in the County and selecting a reasonable value that could be applied across all jurisdictions.

review phase described later. If mischaracterized mobile home parks are identified, manually adjust the developable category designation in the land inventory database.

7. Partially developed parcels in commercial and industrial zones may be split into fully developed and vacant portions for purposes of land capacity analysis.

3.2 Deduct Critical Areas and Other Areas with Reduced Development Potential

In the next step of the process, subtract all the critical areas and other lands with reduced development potential from the inventory of vacant, partially-used, and under-utilized parcels.

Data Needed

- County base critical areas GIS data: National Wetlands Inventory (NWI), rivers, streams, steep slopes, seismic soils, floodplains.
- If available, additional critical areas and shoreline GIS data from local jurisdictions.
- Local critical area and shoreline ordinances.
- Information relating to naturally occurring asbestos.

Steps

1. Integrate local jurisdiction critical area data with County base data. The following areas will be included in the analysis.

Wetlands

The Cities have wetland inventories and these will be utilized when available. Another source of wetlands data available to the County, which will be used to supplement City wetland data, is National Wetlands Inventory (NWI) data.

Streams

Where the ordinary high water mark is not available in County GIS layers, the County's base stream dataset with stream centerlines and an assumed 25 feet of non-buildable area on either side of the centerline will be used in the analysis, unless otherwise specified by the jurisdiction.[3]

Steep Slopes and Hazard Areas

The County will subtract all areas with slopes greater than 35% since there are generally no restrictions on development where slopes are less than 35%. The County will also subtract other hazard areas identified by the jurisdictions as having limited development potential. Areas impacted by alluvial fan hazard areas and regulations restricting land division will also be subtracted.

Floodplain

[3] Buffers vary between and within jurisdictions. For purposes of calculating capacity based on density, a small buffer is used here because lot area can include buffers, and so these areas can be included in the density and capacity calculations.

All land in the floodway will be removed from the inventory. All lands within 100-year floodplains of the unincorporated portions of the Urban Growth Areas will also be removed from the inventory. All lands within floodplains of the incorporated areas will be removed from the inventory where regulations prohibit development, as determined by the applicable City.

Naturally Occurring Asbestos

Land with documented naturally occurring asbestos will be removed from the inventory.

Other Undevelopable Areas

Deduct other areas, such as mitigations sites and old dump sites, that are not available or suited to development.

2. Deduct critical areas and other areas with reduced development potential for residential parcels: Using GIS, overlay the critical areas described above on developable parcels and deduct land area where there is overlap. Critical area buffers are not deducted from residential parcels due to the variety of clustering and density transfer options available on these parcels. Later in the local jurisdiction review process, adjustments to critical area deductions can be made for cases with unique circumstances.
3. Deduct critical areas, land use buffers other areas with reduced development potential for commercial and industrial parcels: Since there are limited, if any, density transfer options for commercial and industrial parcels, critical area buffers will be deducted from these areas. For city UGAs, buffer distances will be based on city critical area regulations. For non-city UGAs, buffer distances will be based on County critical area regulations.
4. The resulting selection of developable parcels unconstrained by these areas will be used as the land base to calculate deductions for future public uses, future infrastructure and market factors.

3.3 Deductions for Future Public Uses

There is a wide range of public uses that should be deducted from developable land totals including schools, police and fire stations, recreation facilities and open space.

Data Needed

- Capital facility plans for public facilities (water, sewer, stormwater, parks, schools) and public services (police, fire), particularly if they include plans for land usage and property acquisition.
- Countywide parcel data with associated ownership information.

Steps

1.

Where available, review existing capital facility plans and identify any parcels or acreage that should be deducted from the developable land inventory. Any property already owned by public entities for future expansion as well as any known public uses in master planned areas should also be identified. Deduct these parcels or acreage totals manually from the inventory if within a jurisdiction's or special purpose district's proposed or approved capital facilities plan.

2. If appropriate, analyze ownership information for parcels in the developable land inventory and exclude those owned by public entities and likely to be used for future public uses. This step may not be necessary if most future public use parcels were already excluded when the first residential, commercial, and industrial parcels were selected.
3. In order to account for other future quasi-public uses (e.g. community centers, daycare centers, churches, etc.) a 5% percent deduction on developable land is used. The deduction should be applied to the Developable Land Inventory after critical areas are removed but before any other deductions for infrastructure or market factors.
4. During the local jurisdiction review process, adjustments to the 5% other public uses deduction may be considered to account for local conditions and data availability.

3.4 Deductions for Future Infrastructure (Rights-of-Way and Other Development Requirements)

Deductions for future infrastructure, including rights-of-way (ROW) and other development requirements, will be based on the percentages of land dedicated to infrastructure in recent plats, permits, and developments. This percentage is calculated in the analysis of recent development activity step described below in **Section 4.1**. Because this deduction is being carried out on land not constrained by critical areas, it is important that the infrastructure percentage deduction factors also be based on land not constrained by critical areas. If there is insufficient data to calculate deduction for infrastructure, then standard deductions based on reasonable assumptions may be used within the analysis.

Data Needed

- Results from recent development activity analysis – percentage of developable area (minus critical areas, associated open space and public uses) devoted to ROWs and other infrastructure .

Steps

1. Summarize acreage of developable land minus critical area and public use deductions by zone for each UGA.
2. Analyze recent development activity to determine infrastructure percentage deduction factors by UGA (see **Section 4.1**).
3. Apply these deduction factors to the inventory of developable land unconstrained by critical areas to calculate the acreage deduction for infrastructure. The infrastructure deduction may be applied by UGA or by specific zone depending on the quantity and quality of recent development activity data.

3.5 Local Jurisdiction Review

Local jurisdiction review of developable parcel designations and other deductions will occur through a series of communications and meetings between County and City staff. Some jurisdictions with complex land supply issues may require more meetings than others. In general, the following review process will be used for the LCA.

Steps

1. The County will generate parcel maps for each UGA showing vacant, partially-used, and under-utilized parcels as well as critical area buffers overlaid on aerial imagery. Some larger UGAs may need to be presented in multiple maps.
2. The maps, along with tabular parcel data underlying the maps will be sent to each local jurisdiction for review. If appropriate, County staff will meet with city staff to discuss any adjustments to developable designations or critical areas that are necessary. These meetings can also be used to discuss infrastructure deductions, public use deductions, assumed density assumptions, market factor assumptions, and other jurisdiction-specific assumptions described elsewhere in this methodology.

The range of additional issues that can be considered during the local jurisdiction review process includes but is not limited to the following:

- Critical areas not identified through GIS analysis
- Known interest in development or redevelopment of particular parcels/areas
- Parking and outdoor storage associated with adjacent uses
- Other associated/related uses spanning multiple parcels
- Irregular parcel shapes making development unlikely

3.6 Market Factor Deduction

The market factor is a final deduction from the net developable area to account for lands assumed not to be available for development during the planning period. It is expected that over the 20-year planning period some lands will be kept off the market due to speculative holding, land banking, and personal use, among other reasons.

Steps

1. Summarize acreage in the Developable Land Inventory by zone, by land use (residential and commercial/industrial) and developable land designation (vacant, partially-used, and under-utilized). This acreage should represent developable land after critical areas, infrastructure, and public uses have been deducted.
2. Apply the following deduction factors to the developable acreage by zone:
    - For vacant residential and commercial/industrial zones: 15% market factor
    - For partially-used and under-utilized residential and commercial/industrial zones: 25% market factor

3. As a reference point, the overall average market factor for all developable land should be calculated for each UGA (total acres deducted based on market factor percentage / total acres in the Developable Land Inventory after critical areas, infrastructure, and public uses have been deducted).
4. The base market factors of 15% and 25% are consistent with those used in the 2009 UGA Review LCA, and accepted practice elsewhere in western Washington. During the local jurisdiction review process, the base market factors may be adjusted to account for local conditions and future plans. If market factors are adjusted, the final overall average market factor for a UGA should not exceed 25%, except where the jurisdiction has well-documented support for why a larger market factor is appropriate.
5. A market factor may be applied to master planned projects in coordination with the city.

3.7 Calculate Net Developable Land

The final acreage totals by zone represent the Net Developable Land Inventory – the land expected to be available to accommodate future population and employment over the planning period.

4.0 DEVELOPMENT DENSITY ASSUMPTIONS

Assumptions about future development density are critical elements in the Land Capacity Analysis because they are needed to convert net developable area (acres) into future population and employment capacity.

4.1 Analysis of Recent Development History (Determine Achieved Densities)

The first step in developing density assumptions is to analyze recent development history to determine the actual densities achieved in different zones and planned land use areas. These achieved densities will serve as reference points and one of the inputs into the determination of assumed future densities in each zone.

The past ten years of development activity (both plats and permits) is used to determine actual net achieved densities of development on both residential and commercial/industrial land. Local jurisdictions will calculate net achieved densities. The net acreage must exclude the same ROWs, critical areas, and public uses excluded from the developable land supply. The final achieved densities will be expressed as dwelling units (DUs) per acre for residential parcels and floor area ratios (FARs) for commercial and industrial parcels.

Data Needed

- All records of development activity in each UGA over the most recent ten period (4/1/2004–4/1/2013)[4] including:
  - Single family residential final plat and short plat activity
  - Multifamily, mixed-use, commercial and industrial building permit activity and binding site plans
- Whatcom County Assessor's Office countywide parcel data in shapefile format. Associated attribute data including lot sq ft.
- GIS shapefiles from cities and the County describing zoning for all jurisdictions, including city designations for associated UGAs.
- County base critical areas GIS data: Wetlands Inventory, streams, steep slopes, seismic soils, floodplains. (see **Section 3.2**)

Steps

1. Cross-reference all plat and permit activity with the Assessor's parcel data to select only those parcels that experienced development activity during the ten year study period.
2. Using GIS, overlay these parcels with critical area layers and calculate the area constrained by critical areas in each zone.
3. For all plat and permit activity, summarize the total acreage of land by zone dedicated to ROWs, infrastructure, and other public purposes.
4. Subtract the area constrained by critical areas, associated open space, infrastructure, areas reserved for future development, and public purposes from the gross parcel area in each zone. The resulting acreage is the net area to use in achieved density calculations.
5. Summarize the total number of lots (for single family plats), units (for multifamily residential and mixed-use building permits), and building square footage (for commercial, industrial, and mixed-use permits) for each zone in a jurisdiction.
6. Use the basic calculations listed in **Exhibit 2** to calculate achieved density for each development type in each zone in each jurisdiction. Final achieved densities will be expressed in terms of DUs per acre for residential zones and FAR for commercial and industrial zones.

Exhibit 2
Basic Achieved Density Calculations by Development Type

Development Type	Achieved Density Calculation
Single Family Subdivision Plats	# Lots / Net Plat Area
Multifamily Building Permits and Plats	# Units / Net Site Area

[4] These dates were chosen to match up with Assessor's data records.

Commercial and Industrial Building Permits	Floor Area / Net Site Area
Mixed-Use Building Permits (Residential Portion)	# Units / Net Residential Portion of Site
Mixed-Use Building Permits (Commercial Portion)	Commercial Floor Area / Net Commercial Portion of Site

Note: For mixed-use buildings, the site area is apportioned between residential and commercial uses based on the share of building square footage dedicated to each use.

7. Calculate the percentage of gross parcel area unencumbered by critical areas that would be dedicated to ROWs and other infrastructure uses, consistent with the development history. The percentage calculated in the development history may exclude plats where no infrastructure was deducted if a large majority of the available land in the UGA is raw land with no existing ROWs or other infrastructure. This percentage is used in future land capacity calculations (see **Section 3.4**)

4.2 Determine Assumed Densities.

For each zone and/or planned land use designation, jurisdictions will develop assumed densities to be used in the Land Capacity Analysis. These assumptions are meant to be reasonable estimates of densities to expect over the 20-year planning period. Assumed densities will only be used for the purposes of the LCA and will not be used to guide or influence other County or local land use policy decisions.

In determining assumed densities, jurisdictions will consider the following range of inputs: recent achieved densities; County and city land use goals and policies; local circumstances including development plans and pending development; and any other local market or policy conditions that are likely to impact future development densities. The County will work with city staff to ensure that reasonable assumed densities are developed.

The determination of assumed densities in each zone and/or planned land use area in each jurisdiction is expected to be an iterative and collaborative process between the County and cities. The process will be challenging because each jurisdiction will have its own set of issues depending on the complexity of its zoning code, other land use policies, and market conditions. In addition, the theoretical densities allowed in an area must be balanced with potentially very different achieved densities in those same zones.

Although establishing one common method for determining assumed densities is not possible, the underlying principle in this process is to develop assumed densities that are reasonable given recent development patterns and expected changes in future densities caused by market and policy factors.

A few of the guidelines to assist jurisdictions in determining assumed densities include:

- **Within City Limits** - Each city will provide a proposal for the assumed density for each zone within its jurisdiction. In general, the comprehensive plan designations, planned densities adopted in the city's GMA-compliant comprehensive plan, city zoning classifications and/or achieved densities will be utilized in the land capacity analysis unless mutually agreed by the city and the County or the County identifies clear and compelling rationale for deviating from these designations and densities.
- **Within a City UGA, outside of City Limits** – A collaborative process between the County and each city will be utilized to develop assumed densities within the portion of the UGA that is outside city limits. This process will take into consideration the city comprehensive plan, city future zoning designations, County Comprehensive Plan, County zoning and achieved densities within the city limits.
- **Unincorporated UGAs** - The County will provide a proposal for the assumed density for each zone within unincorporated UGAs (not associated with a city). In setting assumed densities, the County will consider the County Comprehensive Plan, zoning designations and, if available, achieved densities in the UGA.
- **Overall Assumed Residential Densities** – Each city and the County will work towards assumed residential densities within each UGA that are consistent with Whatcom County Comprehensive Plan Goal 2P. When Goal 2P encourages development within a range of densities for a UGA, the overall assumed density should be within this range. When Goal 2P encourages a single density for a UGA (i.e. four units per net residential acre), the overall assumed density should equal or exceed this density.

Additional Considerations – Mixed Use Zones

In addition to addressing assumed densities, local jurisdictions will also need to address important assumptions for mixed-use zones and/or planned land use areas. Mixed-use parcels represent a unique challenge because they include both residential and commercial capacity.

The proposed approach to deal with these parcels is to make an assumption about what proportion of development will be in residential and commercial uses respectively. These assumptions will be provided by local jurisdictions based on recent patterns in mixed-use development within each planning area, local jurisdiction plans, and local circumstances, including trends and pending development.

5.0 CALCULATE POPULATION AND EMPLOYMENT CAPACITY

The final step in the land capacity analysis is to convert the net developable land inventory (in acres) into population and employment capacity. A series of conversion factors are used to make these calculations including: net assumed densities of future development in each planned land use designation (see **Section 4.2**), average household size, and vacancy rates. The final product is an estimate of the number of people and employees that can be accommodated in each UGA on developable land. These estimates will be directly comparable to the forecasted population and employment totals allocated to each UGA over the 20-year planning period.

5.1 Determine Population Capacity

This section describes how capacity to accommodate future population growth is derived from the net developable area in residential zones and the residential portion of mixed-used zones.

Data Needed

- The Net Developable Land Inventory of residential and mixed-use zones (see **Section 3.0**)
- Assumed densities for residential and mixed-use zones (see **Section 4.2**)
- Whatcom County Assessor's Office data for partially-used and under-utilized parcels.
- Pending permit and plat data – permits and plats for developments that have received preliminary approval but have not been constructed as of April 1, 2013. Pending data includes those areas that have been "master planned" by the city, such as the Waterfront area in Bellingham and Semiahmoo Resort in Blaine.
- Best available data from OFM and/or the US Census on occupancy rates and average household sizes.

Steps

Determine Total Dwelling Unit Capacity by Zone

1. multiply net developable acres of residential developable land in each zone by the assumed density (DUs/acre) for each zone. The output will be the total dwelling unit capacity available in each zone before accounting for existing development on partially-used and under-utilized parcels.
2. Subtract existing dwelling units on partially-used and under-utilized parcels by zone. from the totals from the previous step so that existing units are not counted as part of partially-used or under-utilized parcel capacity.

3. Generate subtotal dwelling unit capacity by zone by adding dwelling unit capacity.
4. Earlier in the process, parcels with pending developments were set aside. These parcels included preliminary or final plats, permits, and binding site plans for developments that have received preliminary approval but have not been constructed by April 1, 2013. Master planned projects that have not been completely built out but have received approval for a certain number of dwelling units are also included (see **Section 3.1**).

   The estimated capacity in these developments is more accurate than calculated theoretical capacity. Summarize total dwelling units in these pending developments by zone. Add these units to subtotal dwelling units from Step 4. The output will be total dwelling units of capacity available in each zone.

Calculate Total Occupied Dwelling Unit Capacity by Zone

5. Apply occupancy rate assumptions for each UGA by using best available data from OFM and/or the US Census.[5].
6. Multiply the total dwelling units of capacity in each zone by occupancy rate assumptions for each UGA. The output will be total occupied dwelling units in each zone.

Calculate Total Population Capacity by UGA

7. Apply average household size assumptions for each UGA by using best available data from OFM and/or the US Census.
8. The local jurisdiction will categorize each zone as either a single family zone or multifamily zone. The distinction between single family and multifamily zones is important because there are different occupancy rates and average household sizes for single family and multifamily development.
9. Multiply total occupied dwelling units in the single family and multifamily categories in each zone by average household size assumptions for these categories. The final output will be total population capacity within each UGA.
10. The population capacity in each UGA can be compared to the population allocated to each UGA to determine where excess or insufficient developable land capacity is an issue.

5.2 Determine Employment Capacity

This section describes how capacity to accommodate future employment growth is derived from the net developable area in commercial and industrial zones and the commercial portion of mixed-used zones.

Data Needed

- The Net Developable Land Inventory of commercial, industrial, and mixed-use zones (see **Section 3.0**)
- Assumed FAR values for commercial, industrial, and mixed-use zones (see **Section 4.2**)

[5] Seasonal housing is considered vacant according to Census definitions. These housing units are not included in the occupied housing unit category and are not folded into Census calculations of average household size.

- Assumed square feet per employee (FTE) for commercial or industrial space
- Whatcom County Assessor's Office data for partially-used and under-utilized parcels.
- Pending commercial and industrial building permit data – permits and binding site plans that have received preliminary approval but have not been constructed as of April 1, 2013. Pending data includes those areas that have been "master planned" by the city, such as the Waterfront and Airport areas in Bellingham and Semiahmoo Resort in Blaine.

Steps

Determine Total Square Footage Capacity by Zone

1. Multiply net acres of commercial and industrial developable land in each zone by the assumed FAR for each zone. The output will be the total square footage capacity available in each zone before accounting for existing development on partially-used and under-utilized parcels.
2. Summarize total existing commercial and industrial building square footage on partially-used and under-utilized parcels by zone. Subtract this square footage from the totals from the previous step so that existing buildings are not counted as part of partially-used or under-utilized parcel capacity.
3. Earlier in the process, parcels with pending developments were set aside. These parcels included commercial and industrial permits or binding site plans for developments that have received preliminary approval but have not been constructed by April 1, 2013. Master planned projects that have not been completely built out but have received approval for a certain amount of commercial/industrial square footage are also included (see **Section 3.1**). The estimated capacity in these developments is more accurate than calculated theoretical capacity. Summarize total commercial and industrial building square footage in these pending developments by zone. Add this square footage to the totals from Step 2. The output will be total commercial and industrial square footage capacity available in each zone.

Determine Total Occupied Square Footage by Zone

4. Multiply the total square footage capacity in each zone by a 95% occupancy rate assumption. The occupancy rate assumption can be adjusted based on current and accurate data provided by local jurisdictions (e.g. annual real estate market reports). The output will be total occupied commercial and industrial square footage in each zone.

Determine Total Employment Capacity by UGA

5. Aggregate the occupied commercial and industrial square footage capacity by zone into the two categories used in the future employment allocation process: Commercial/Retail and Industrial. These categories each include specific NAICS-based industries (see **Exhibit 3** in last section of this document).

6. Determine employment density (square footage of floor-space per employee) assumptions for future commercial, retail, and industrial development. Employment density will be based upon one of the following:
    a. The employment density recommended by the local jurisdiction, provided that their recommendation is based upon achieved employment densities or other relevant data.
    b. Employment densities derived from the 2008 City of Bellingham Employment Lands Report (April 2009), which are as follows:
        - Commercial/Retail: 626 square feet per employee
        - Industrial: 775 square feet per employee
7. Divide the total occupied commercial and industrial square footage in each category by the employment density assumptions. The final output will be total employment capacity within each UGA.
8. The employment capacity in each UGA can be compared to the employment allocated to each UGA to determine where excess or insufficient developable land capacity is an issue.

6.0 DEFINITIONS

Land Use Categories

- Mixed-use – developments incorporating both residential and non-residential uses.
- Commercial (as term is used generally in main body of this document) includes the commercial and retail uses listed in Exhibit 3 below.
- Industrial (as term is used generally in main body of this document)) includes the industrial uses listed in Exhibit 3 below.

Exhibit 3
Suggested Industry Classifications for Employment Allocation Process

Commercial	Industrial	Retail
Information	Utilities	Retail Trade
Finance and Insurance	Construction	Food Service and Drinking Places (3-digit NAICS - 722)
Real Estate and Rental and Leasing	Manufacturing	
Arts, Entertainment, and Recreation	Wholesale Trade	
Professional, Scientific, and Technical Services	Transportation and Warehousing	
Management of Companies and Enterprises		
Administrative and Support and Waste Management and Remediation Services		
Health Care and Social Assistance		
Educational Services		
Accomodations (3-digit NAICS - 721)		
Other Services (except Public Administration)		
Public Administration		

Land Categories

- Vacant – property with little or no building improvements(see Exhibit 1 for a detailed explanation);
- Under-utilized – property zoned for a more intensive use than that which currently occupies it (e.g. a single family home on commercially zoned land) (see Exhibit 1 for a detailed explanation); and
- Partially-used – property occupied by a use consistent with zoning but containing enough land to be further subdivided or developed without need of rezoning. (e.g. a single family home on a very large lot) (see Exhibit 1 for a detailed explanation).
- Fully developed – property that is assumed to have no further development capacity.

Other Terms

- Developable Parcels or Developable Land – all parcels that are vacant, partially-used, under-utilized
- Gross Developable Land Inventory – total area of developable parcels before deductions for critical areas, infrastructure, public uses, and market factors are taken into account.
- Net Developable Area or Net Developable Land Inventory – total area of developable parcels after deductions for critical areas, infrastructure, public uses, and market factors are taken into account.
- Achieved Density – density of residential development (DUs per net acre) and commercial/industrial development (net FAR) achieved over the past ten years of development activity.
- Assumed Density – assumption of residential density (DUs per net acre) and commercial/industrial development (net FAR) expected on developable land over the 20-year planning period.
- Net Plat Area – total area of plats after deductions for critical areas, infrastructure, and public uses are taken into account.
- Net Site Area – total area of commercial, industrial and multifamily development sites after deductions for critical areas, infrastructure, and public uses are taken into account. Site area will sometimes not be equal to parcel area. (e.g. when multiple buildings are on one parcel)

Conversion Factors

- Employment Density – the average amount of floor-space required to accommodate an employee. For the purposes of this study, expressed as square feet per employee.
- Floor Area Ratio (FAR) – total building square footage divided by lot square footage.
- Average Household Size –the average number of people per occupied housing unit (this is the same definition used by the U.S. Census).

Appendix C

LCA Assumptions

Land Capacity Analysis Assumptions
Bellingham UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	586 ac	City staff: park acres needed based on parks LOS; assume 40% from industrial zones and 60% from residential, per past park land acquisitions, decuct pro rata
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	28.8%	City staff: from 2004-2013 plat data
Infrastructure Subtraction MF	3.4	15%	City staff: 2004-2013 plat data indicate 11% stormwater subtractions but many were on already platted lots. Use 15% to account for infrastructure in unplatted areas.
Infrastructure Subtraction Comm/Ind	3.4	10%	10% standard deduction per LCADM 3.4
Market Factor Vacant Res	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	various	City staff: 50.79% for Waterfront District consistent with subarea financial model assumptions; 50% for Old Town UV due to env cleanup issues; 50% for Samish Way UV due to need to redevelop old hotels; 15% for Fountain UV to reflect expected development timeline; 0% in Fairhaven and Barkley to reflect actual development trends. Downtown UV DU figure reflects City projection of 2013-2036 development, a 48% reduction from total esimated DU capacity.
Occupancy Rate SF	5.1 step 5	96.00%	OFM 2010 housing data
Household Size SF	5.1 step 7	2.49	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	92.75%	OFM 2010 housing data
Household Size MF	5.1 step 7	1.86	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	0.4	City staff: based on 2004-2013 commercial/industrial/ institutional development data
Floor Area Ratio Industrial	4.2	0.25	City staff: based on 2004-2013 commercial/industrial/ institutional development data
Occupancy Rate Commercial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	626	Given in LCADM, Section 5.2, Step 6
Employment Density Industrial	5.2 step 6	775	Given in LCADM, Section 5.2, Step 6
Residential Density by Zone	4.2	various	City staff, based on planned densities by zone
Res Units and Comm/Ind SF for Master Plan and Pending Projects	5.2 step 3	various	City staff, based on approved projects and plans
Non-residential % in mixed use zones	4.2	various	City Staff: 40% non-residential in City mixed use zones based on project approvals and zoning, 10% in unincorporated URMX zone where limited commercial is permitted

Land Capacity Analysis Assumptions
Birch Bay UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	n/a	
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	33.7%	2004-2013 plat data
Infrastructure Subtraction MF	3.4	27.3%	2004-2013 plat data
Infrastructure Subtraction Comm/Ind	3.4	10.0%	Standard deduction per LCADM 3.4
Market Factor Vacant Res	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	n/a	
Occupancy Rate SF	5.1 step 5	74.40%	OFM 2010 housing data
Household Size SF	5.1 step 7	2.29	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	51.00%	OFM 2010 housing data
Household Size MF	5.1 step 7	1.65	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	0.161	County staff: consistent with Ferndale's FAR
Floor Area Ratio Industrial	4.2	n/a	
Occupancy Rate Commercial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	626	Given in LCADA, Section 5.2, Step 6
Employment Density Industrial	5.2 step 6	n/a	
Residential Density by Zone	4.2	various	County staff, based on planned densities by zone
Res Units and Comm/Ind SF for Pending Projects	5.2 step 3	various	County staff, based on approved projects
Non-residential % in mixed use zones	4.2	n/a	

Land Capacity Analysis Assumptions
Blaine UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	n/a	
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	32.6%	City staff: 2004-2013 plats where infrastructure was subtracted
Infrastructure Subtraction MF	3.4	19.8%	City staff: 2004-2013 plats where infrastructure was subtracted
Infrastructure Subtraction Comm/Ind	3.4	10%	Standard deduction per LCADM 3.4
Market Factor Vacant Res	3.6 step 2	15%, 70%	Given in LCADM, Section 3.6, Step 2; City staff: use 70% for PR zone (excluding master plan areas) due to lack of utilities and due to major landowners' stated unwillingness to develop
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%, 70%	Given in LCADM, Section 3.6, Step 2; City staff: use 70% for PR zone (excluding master plan areas) due to lack of utilities and due to major landowners' stated unwillingness to develop
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	50%	City staff: 50% market factor due to lack of utilities and anticipated long buildout period, based on Semiahmoo development rate
Occupancy Rate SF	5.1 step 5	85.52%	OFM 2010 housing data
Household Size SF	5.1 step 7	2.47	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	82.82%	OFM 2010 housing data
Household Size MF	5.1 step 7	2.03	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	0.2	City staff: based on City employment study
Floor Area Ratio Industrial	4.2	0.3	City staff: based on City employment study
Occupancy Rate Commercial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	626	Given in LCADM, Section 5.2, Step 6
Employment Density Industrial	5.2 step 6	775	Given in LCADM, Section 5.2, Step 6
Residential Density by Zone	4.2	various	City staff, based on planned densities by zone
Res Units and Comm/Ind SF for Master Plan and Pending Projects	5.2 step 3	various	City staff, based on approved projects and plans
Non-residential % in mixed use zones	4.2	various	City Staff: based on zoning code provisions and development trends

Land Capacity Analysis Assumptions
Cherry Point UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	n/a	
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	n/a	
Infrastructure Subtraction MF	3.4	n/a	
Infrastructure Subtraction Comm/Ind	3.4	10.0%	Standard deduction per LCADM 3.4
Market Factor Vacant Res	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	n/a	
Occupancy Rate SF	5.1 step 5	95.24%	OFM 2010 housing data
Household Size SF	5.1 step 7	2.85	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	n/a	OFM 2010 housing data
Household Size MF	5.1 step 7	n/a	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	n/a	
Floor Area Ratio Industrial	4.2	0.075	County staff: assume same FAR as 2009 LCA
Occupancy Rate Commercial	5.2 step 4	n/a	
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	n/a	
Employment Density Industrial	5.2 step 6	3,500	County staff: assume same density as 2009 LCA
Residential Density by Zone	4.2	n/a	
Res Units and Comm/Ind SF for Pending Projects	5.2 step 3	n/a	
Non-residential % in mixed use zones	4.2	n/a	

Land Capacity Analysis Assumptions
Columbia Valley UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	n/a	
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	33.7%	County staff: lack of recent plat data - use subtraction consistent with non-city UGA Birch Bay
Infrastructure Subtraction MF	3.4	27.3%	County staff: lack of recent plat data - use subtraction consistent with non-city UGA Birch Bay
Infrastructure Subtraction Comm/Ind	3.4	10.0%	Standard decuction per LCADM 3.4
Market Factor Vacant Res	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	n/a	
Occupancy Rate SF	5.1 step 5	78.42%	OFM 2010 housing data
Household Size SF	5.1 step 7	2.8	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	78.42%	OFM 2010 housing data
Household Size MF	5.1 step 7	2.8	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	0.161	County staff: lack of recent comm/ind data - use FAR consistent with non-city UGA Birch Bay and Ferndale
Floor Area Ratio Industrial	4.2	0.165	County staff: lack of recent comm/ind data - use FAR consistent with non-city UGA Birch Bay and Ferndale
Occupancy Rate Commercial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	626	Given in LCADM, Section 5.2, Step 6
Employment Density Industrial	5.2 step 6	775	Given in LCADM, Section 5.2, Step 6
Residential Density by Zone	4.2	4.0	County staff: UR-4 zone
Res Units and Comm/Ind SF forPending Projects	5.2 step 3	n/a	
Non-residential % in mixed use zones	4.2	n/a	

Land Capacity Analysis Assumptions
Everson UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	1.5	City staff: 1.5 acres for future fire station in Res MU
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	29.0%	City staff: based on plat data
Infrastructure Subtraction MF	3.4	25.0%	City staff: based on plat data
Infrastructure Subtraction Comm/Ind	3.4	15.0%, 20.0%	City staff: based on recent development
Market Factor Vacant Res	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	n/a	
Occupancy Rate SF	5.1 step 5	96.45%	OFM 2010 housing data
Household Size SF	5.1 step 7	3.06	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	90.63%	OFM 2010 housing data
Household Size MF	5.1 step 7	2.93	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	0.2	City staff: consistent with 2009 LCA
Floor Area Ratio Industrial	4.2	0.3	City staff: consistent with 2009 LCA
Occupancy Rate Commercial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	900	City staff: consistent with 2009 LCA
Employment Density Industrial	5.2 step 6	2,000	City staff: consistent with 2009 LCA
Residential Density by Zone	4.2	various	City staff, based on planned densities by zone
Res Units and Comm/Ind SF for Pending Projects	5.2 step 3	various	City staff, based on approved projects
Non-residential % in mixed use zones	4.2	n/a	

Land Capacity Analysis Assumptions
Ferndale UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	32	City staff: 11 ac for parks pro rata across all zones, 15 ac from SF-8500 and 3 ac each from SF-6500 and SF-10500
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	31.3%	City staff: per plat data
Infrastructure Subtraction MF	3.4	31.3%	City staff: per plat data
Infrastructure Subtraction Comm/Ind	3.4	10.0%	Standard deduction per LCADM 3.4
Market Factor Vacant Res	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	n/a	
Occupancy Rate SF	5.1 step 5	95.24%	OFM 2010 housing data
Household Size SF	5.1 step 7	2.85	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	93.97%	OFM 2010 housing data
Household Size MF	5.1 step 7	2.31	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	0.161	City staff: based on city employment analysis
Floor Area Ratio Industrial	4.2	0.165	City staff: based on city employment analysis
Occupancy Rate Commercial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	870	City staff: based on city employment analysis
Employment Density Industrial	5.2 step 6	1,071	City staff: based on city employment analysis
Residential Density by Zone	4.2	various	City staff, based on planned densities by zone and achieved densities
Res Units and Comm/Ind SF for Pending Projects	5.2 step 3	various	City staff, based on approved projects
Non-residential % in mixed use zones	4.2	various	City staff: based on development trends and code requirements

Land Capacity Analysis Assumptions
Lynden UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	n/a	
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	25.7%	City staff: based on plat data
Infrastructure Subtraction MF	3.4	26.0%	City staff: based on plat data
Infrastructure Subtraction Comm/Ind	3.4	10.0%	Standard deduction per LCADM 3.4
Market Factor Vacant Res	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	n/a	
Occupancy Rate SF	5.1 step 5	96.90%	OFM 2010 housing data
Household Size SF	5.1 step 7	2.88	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	91.92%	OFM 2010 housing data
Household Size MF	5.1 step 7	1.68	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	0.161	City staff: consistent with Ferndale
Floor Area Ratio Industrial	4.2	0.165	City staff: consistent with Ferndale
Occupancy Rate Commercial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	626	Given in LCADM, Section 5.2, Step 6
Employment Density Industrial	5.2 step 6	775	Given in LCADM, Section 5.2, Step 6
Residential Density by Zone	4.2	various	City staff, based on planned densities by zone
Res Units and Comm/Ind SF for Pending Projects	5.2 step 3	various	City staff, based on approved projects
Non-residential % in mixed use zones	4.2	n/a	

Land Capacity Analysis Assumptions
Nooksack UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	n/a	
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	30.0%	City staff: based on plat data
Infrastructure Subtraction MF	3.4	30.0%	City staff: based on plat data
Infrastructure Subtraction Comm/Ind	3.4	15.0%, 20.0%	City staff: based on recent development
Market Factor Vacant Res	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	n/a	
Occupancy Rate SF	5.1 step 5	95.19%	OFM 2010 housing data
Household Size SF	5.1 step 7	3.1	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	93.33%	OFM 2010 housing data
Household Size MF	5.1 step 7	3.14	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	1,100	City staff: consistent with 2009 LCA
Floor Area Ratio Industrial	4.2	2,000	City staff: consistent with 2009 LCA
Occupancy Rate Commercial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	626	Given in LCADM, Section 5.2, Step 6
Employment Density Industrial	5.2 step 6	775	Given in LCADM, Section 5.2, Step 6
Residential Density by Zone	4.2	various	City staff, based on planned densities by zone
Res Units and Comm/Ind SF for Pending Projects	5.2 step 3	various	City staff, based on approved projects
Non-residential % in mixed use zones	4.2	n/a	

Land Capacity Analysis Assumptions
Sumas UGA

	LCADM Ref	Value	Source
Future Public Uses	3.3 step 1	n/a	
Other Public Uses	3.3 step 3	5%	Given in LCADM, Section 3.3, Step 3
Infrastructure Subtraction SF	3.4	15.0%	City staff: based on plat data
Infrastructure Subtraction MF	3.4	25.0%	City staff: based on plat data
Infrastructure Subtraction Comm/Ind	3.4	10.0%	Standard deduction per LCADM 3.4
Market Factor Vacant Res	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor Vacant Comm/Ind	3.6 step 2	15%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Res	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor PU, UU Ind/Comm	3.6 step 2	25%	Given in LCADM, Section 3.6, Step 2
Market Factor Master Planned	3.6 step 5	n/a	
Occupancy Rate SF	5.1 step 5	94.48%	OFM 2010 housing data
Household Size SF	5.1 step 7	2.89	OFM 2010 housing data
Occupancy Rate MF	5.1 step 5	90.57%	OFM 2010 housing data
Household Size MF	5.1 step 7	2.21	OFM 2010 housing data
Floor Area Ratio Commercial	4.2	0.22	City staff: consistent with 2009 LCA
Floor Area Ratio Industrial	4.2	0.11	City staff: consistent with 2009 LCA
Occupancy Rate Commercial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Occupancy Rate Industrial	5.2 step 4	95%	Given in LCADM, Section 5.2, Step 4
Employment Density Commercial	5.2 step 6	629	City staff: consistent with 2009 LCA
Employment Density Industrial	5.2 step 6	1,500	City staff: consistent with 2009 LCA
Residential Density by Zone	4.2	various	City staff, based on planned densities by zone
Res Units and Comm/Ind SF for Pending Projects	5.2 step 3	various	City staff, based on approved projects
Non-residential % in mixed use zones	4.2	n/a	