COMPREHENSIVE PLAN 2016 UPDATE
COMMENTS/TESTIMONY RECEIVED MARCH 3 – APRIL 14, 2016

Name	***Organization***	***Topic(s)***	***Method***
Adams, Brian & Semrau, John	Skagit County Parks & Rec	Trails, Public Health, Open Space	Letter (4/14/16)
Baker, Sarah	Edison Granary	Edison Granary, Concrete Concepts	Testimony
Bell, Kasey		Non-Motorized Transportation, Public Health, Trails	Email (4/14/16)
Bell, Marjorie	United General District 304 & self	Non-Motorized Transportation, Public Health, Trails	Testimony + email (4/13/16)
Breen, Margaret & Landefeld, Stewart		Guemes	Email (4/14/16)
Bynum, Ellen	FOSC	S-W & Burlington UGAs, Multiple Policy & Code Issues	Testimony + letter (4/14/16)
Calvert, Wilson		Lake Erie Trucking	Letter (4/5/16)
Charles, Stuart D. & Arden S.		Guemes	Letter (4/11/16)
Christ, Peter		S-W UGA	Letter (3/17/16)
Clancey, Gary		Non-Motorized Transportation	Email (4/7/16)
Clancey, Paula		Non-Motorized Transportation	Email (4/8/16)
Clough, Debbie		Non-Motorized Transportation	Email (4/13/16)
Coleman, John	City of Sedro-Woolley	S-W UGA	Testimony
Crowl, Liz McNett		Open Space, Non-Motorized Transportation, Public Health	Email (4/14/16)
Doran, Molly	Skagit Land Trust	Open Space, Environment, Non-Motorized Transportation	Letter (4/14/16)
Ehlers, Carol		Lake Erie Trucking, Tax Base, Fidalgo, Multiple Policy & Code Issues	Testimony + drawings, map (4/5/16) + letter (4/14/16)
Elder , Chris E.		S-W UGA	Email (4/5/16)
Erbstoeszer, Marie & John		Non-Motorized Transportation, Public Health,	Email (4/13/16)

COMPREHENSIVE PLAN 2016 UPDATE
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		Environment, Envision Skagit	
Erickson, Christy		Edison Granary	Email (4/9/16)
Foist, R. Houston	Concrete Concepts	Concrete Concepts, Edison Granary	Testimony
Fouts, Tom & Juby		Guemes	Letter (4/7/16)
Fox, Nancy	GIPAC	Guemes	Testimony + email (3/31/16)
Freethy, Diane	SCARP	Freight Rail Transportation	Email (4/13/16)
Fulton, Diane; Fulton, David & Nancy		Lake Erie Trucking	Email (4/14/16)
Good, Randy		Non-Motorized Transportation, NRL Disclosure	Testimony + letters (4/5 & 4/14/16)
Good, Randy & Aileen		Freight Rail Transportation	Letter (4/14/16)
Hagland, Gary		Process, Non-Motorized Transportation, Affordable Housing, Freight Rail Transportation	Email (4/14/16)
Hallberg, Jeroldine		Non-Motorized Transportation, Open Space, Affordable Housing	Email (4/14/16)
Harma, Kit		Guemes	Email (3/31/16)
Havens, Dyvon Marie		Guemes	Email (4/4/16)
Highet, John		Edison Granary	Email (3/22/16)
Johnson, Brad	City of Burlington	Burlington UGA	Email (4/5/16)
Johnson, Jennifer	Skagit County Public Health	Affordable Housing	Email (4/1/16)
Lagerlund, Nels	Agricultural Advisory Board	Ag-NRL Uses	Letter (4/13/16)
Lee, Harold		Non-Motorized Transportation	Email (4/13/16)
Madden, Mark		Guemes	Testimony + issue paper (4/5/16)
McGuiness, Cindy		Non-Motorized Transportation	Email (4/14/16)
McNett, Katie		Non-Motorized Transportation, Open Space	Testimony + email (4/14/16)
Metcalf, Mitchell		Non-Motorized Transportation,	Email (4/14/16)

COMPREHENSIVE PLAN 2016 UPDATE
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		Public Health, Trails	
Munsey, Connie		Non-Motorized Transportation	Testimony + email (4/6/16)
Murphy, William Jefferson		S-W UGA	Testimony
O'Donnell, Susan S.		Guemes	Email (4/14/16)
Orsini, Stephen		Guemes	Testimony + letter (4/5/16)
Palmer, Joan H.		Guemes	Letter (4/8/16)
Pare, Robert & Wendy		Edison Granary	Email (4/10/16)
Pearson, Mark	United General District 304 & self	Non-Motorized Transportation, Public Health, Trails	Email (4/14/16)
Pellett, Howard & Carol		Guemes	Email (4/2/16)
Pernula, Dale	Skagit County	Burlington UGA	Testimony
Perry, Irene & Manns, Timothy	Skagit Audubon Society	Envision Skagit, Open Space, Non-Motorized Transportation, Environment	Email (4/7/16)
Peyou, Sally		Guemes	Email (4/14/16)
Philips, Gabe	SCOG	Transportation	Email (4/12/16)
Potter, Maggie		Non-Motorized Transportation	Email (4/14/16)
Prewitt, Lynn D.		Guemes	Email (4/14/16)
Rawson, Kit		Non-Motorized Transportation	Email (4/12/16)
Rohweder, Richard		Burlington UGA	Email (3/11/16)
Rooks, Hal	GIPAC	Guemes	Testimony + letter (4/5/16) + email (4/13/16)
Roozen, Brandon	Western WA Ag Association	Non-Motorized Transportation	Letter (4/14/16)
Rose, Patty	GIPAC	Guemes	Testimony + letter (4/5/16)
Schnabel, Barbara		Guemes	Email (4/12/16)
Sherman, David	Valley High Investments, Inc.	S-W UGA	Testimony + email (4/7/16) + letter (4/11/16)
Stauffer, Ed		Process	Email (4/14/16)
Steele, Lorrie		Guemes	Email (4/5/16)
Taylor, Stephen	Lake Erie Trucking	Lake Erie Trucking	Testimony + maps (4/5/16)
Thornburgh, Kathy		Non-Motorized Transportation	Email (4/12/16)

COMPREHENSIVE PLAN 2016 UPDATE
COMMENTS/TESTIMONY RECEIVED MARCH 3 – APRIL 14, 2016

Trohimovich, Tim	Futurewise	Multiple Policy & Code Issues	Email (4/14/16)
Ullman, Carl (Bud)		Guemes	Email (4/1/16)
Walden, Edith		Guemes	Testimony + letter (4/5/16)
Wallace, Jack R.		Non-Motorized Transportation	Email (4/11/16)
Ware, Mike	Skagit County Cattlemen's	Open Space, Envision Skagit, Non-Motorized Transportation, Freight Rail Transportation	Letter (4/14/16)
Warren, Lawrence		S-W UGA	Email (3/19/16)
Wickert, Ray		Burlington UGA	Letter (4/6/16)
Wooding, Bill	Lake Erie Trucking	Lake Erie Trucking	Testimony

The following comments were received during the written public comment period but were improperly submitted.

Jeretzky, Frank	Email (3/23/16)
Madden, Mark	Email (4/14/16)
Murphy, William Jefferson	Letter (3/14/16)
Xaver, Andrea	Email (4/14/16)

SKAGIT COUNTY
Parks and Recreation

RECEIVED
APR 14 2016
SKAGIT COUNTY
PDS

Comprehensive Plan 2016 Update: Trails and Open Space

Dear Planning Commissioners,

Thank you for this opportunity to comment on the 2016 Comprehensive Plan Update. The Parks and Recreation Department greatly appreciates all the tremendous work that you and the planning staff have undertaken to complete the recently released draft.

Trails continue to be the most important recreational amenity we can provide the public. Trails support numerous healthy pastimes, including hiking, biking, horse riding, wildlife watching, as well as other vibrant recreational activities. From a Parks and Recreation perspective, we know how important it is to prioritize trails in our planning processes, as they are relatively inexpensive to maintain in measure to the value they provide.

With a growing amount of press coverage about illnesses attributed to expanding waistlines, physical inactivity is now widely recognized as an American health epidemic. Studies show that over a third of Americans are obese and more than half are overweight. People that are overweight or obese are at greater risk of an onset of chronic health issues, including coronary heart disease, type-2 diabetes, and cancer. Putting the epidemic into a perspective of longevity, a recent study indicates that children being born in 2015 aren't projected to live as long as those born in prior years.

The best way in which to reverse the growing obesity epidemic and increase the health of our citizens is for parks and recreation representatives to respond to surveys, use patterns, public input, and comprehensive plans by ensuring trails are prevalently provided in our community. As park and recreational providers, we must listen to the demands of the public in our jurisdictional communities. As a board, we have been involved in numerous local surveys and community forums in our community and can say with absolute conviction that trails and waterfront access continue to rank one and two respectively on the recreational needs list for the people of Skagit County. In looking at the State Comprehensive Outdoor Recreation Plan, we see the same survey trends i.e., (1) people want trails and, (2) the closer the trails are to the doorstep, the more likely they are to be utilized.

Open Space Lands support a network of trails in Skagit County and we believe we need to continue to expand our recreational spaces as our population continues to increase. Open Space Lands provide recreational activities, allow for the uninhibited movement of wildlife, support habitat for the biotic community, and allow all citizens, regardless of personal resources, access to public spaces. Skagit County Parks and Recreation strongly encourage the promotion of trails and open spaces in creating a better community for our citizens.

Respectfully Submitted,

Brian Adams, Parks and Recreation Director

John Semrau, Parks and Recreation Advisory Board Chair

P. O. Box 1326
Mount Vernon, WA 98273

360.416.1350 phone
360.336.9493 facsimile

http://skagitcounty.net/offices/parks/index.htm

From: Kasey Bell
To: PDS comments
Subject: Comprehensive Plan
Date: Thursday, April 14, 2016 11:22:13 AM

Hello Skagit County Planning Department Staff:

First of all, thank you for your tireless efforts on behalf of Skagit County residents. I appreciate all that you do! My comments about proposed goals, policies, and recommendations in the 2016 Skagit County Comprehensive Plan update are in support of language that recognizes the importance of trails to benefit health, the environment, and the economy. Please retain the proposed language in the plan (highlighted in yellow; new text underlined) for improved personal, environmental, and economic health for everyone.

Chapter 2, Urban, Land Use and Open Space Element

- *Policy 2A-6.2 Adopt plans, policies, codes and development standards that promote public health by increasing opportunities for residents to be more physically active. Such actions include: concentrating growth into Urban Growth Areas, promoting more compact urban development, allowing mixed-use developments, and adding pedestrian and non-motorized linkages where appropriate.*

- *Policy 2A-6.3 Concentrate facilities and services within Urban Growth Areas, using urban design principles, to make them desirable places to live, work, and play; increase the opportunities for walking and biking within the community; use existing infrastructure capacity more efficiently; and reduce the long-term costs of infrastructure maintenance.*
- *Policy 2B-1.3 Implement the adopted Skagit Countywide UGA Open Space Concept Plan to conserve open space areas, greenbelts and corridors within and between urban growth areas.*

  (a) Plan implementation should seek to protect lands useful for recreation, wildlife habitat, trails, and connection of critical areas, and working farm and forest lands.

Chapter 8: Transportation Element

- *Policy 8A-6.4 Provide for the diverse needs of bicycle, pedestrian and equestrian modes through appropriate routing and the utilization of single-use and shared-use facilities. Encourage public education for motorists and non-motorized users alike on the importance of "sharing the road," consistent with Traffic Safety policy 8A-10.3.*

- *Policy 8A-6.6 Coordinate system planning, funding, and development with other local, regional, state, federal and tribal jurisdictions; and with public transit*

providers, as most public transit trips begin and end with walking or biking.

- *Policy 8A-6.11 Community and subarea plans should identify and address the implementation of pedestrian, bicycle and (where appropriate) equestrian facilities that provide safe, efficient and convenient access to residential neighborhoods, schools, parks and recreation facilities, commercial districts, activity centers, tourist areas and established or planned multi-use trails.*

- *Policy 8A-6.12 Emphasize maintenance of existing non-motorized facilities, including road sweeping, striping, signing, and debris removal, and the ongoing development of smooth and continuous road shoulders, including asphalt overlays or enhanced chip sealing where appropriate and feasible.*

As a bicyclist and a bike commuter, I consider trails to be an essential part of Skagit County's transportation network. I do not consider bicycling to be a "hobby" but as a mode of transportation, in the same way that my colleagues who drive to work think of the automobile to be their mode of transportation. Furthermore, when I bike to work I arrive invigorated and fully awake, without contributing to traffic or competing for a parking space (I have yet to meet anyone in favor of traffic jams or too few parking spaces.) A British Columbia Cycling Coalition study showed that physically active employees work at full efficiency throughout the day, resulting in 12.5% greater productivity, which can save $572 per employee per year. Improving walking and bicycling conditions benefits all roadway users, especially in urban areas where around 50% of all trips are less than three miles in distance. In addition, by biking I have met or exceeded the recommended minimum of 30 minutes a day of vigorous physical activity, and will likely cost less in long-term health care costs than most Americans my age. Best yet, I do own automobiles (as do most bicyclists) and pay the same auto-related taxes that everyone else pays. I believe in allocating public funding toward healthy built environments such as non-motorized trails. Rather than a frivolous expense, it is a sound investment in the future.

The Rails to Trails Conservancy estimates the monetary value of the benefits of walking and bicycling in the US to be $4.1 billion per year, an amount that reflects transportation costs, oil dependence, climate change, and public health benefits. They also estimate that increasing the mode share of walking and bicycling from its current 9.6% to 25% would result in $65.9 billion annually in accrued benefits.

In terms of landowner objections to trails, many of the more verbal Skagit residents are motivated by individual convenience, suspicion, or fear that trails will reduce property values. In fact, several studies have shown a positive correlation between property values and proximity to bicycle and pedestrian amenities. In a National Association of Home Buildings and National Association of Realtors survey that asked about the most important community amenities, 36% of respondents indicated that jogging and bicycle trails were most or very important, and 26% indicated sidewalks. Another study from Florida found that people were willing to pay $20,000 more for homes in pedestrian-friendly communities!

The recent designation of SR20 as US Bicycle Route 10 (USBR10) has great potential to be an

economic booster for Skagit County communities along the route. Safe, convenient linkages would make this a great draw for bicycle tourism!

Lastly, I would like to point out how the proposed non-motorized trail language in the 2016 Comprehensive Plan update aligns with and supports Skagit County's 2013 Comprehensive Parks and Recreation Plan, which includes the following
Trail Development Objectives: ƒ

- Skagit County will work with other county, state, and city parks to establish links and connecting trails. ƒ
- Provide trails for pedestrians (including, where feasible, access for persons with disabilities), bicyclists, equestrians, and other trail users. ƒ
- Provide for linkages of population centers, community facilities, workplaces, neighborhoods, schools, recreation areas, open space and cultural/historical areas. ƒ
- Coordinate with other agencies to ensure a comprehensive approach to trail planning. ƒ Separate recreational trails from motorized vehicle traffic where feasible. ƒ
- Create a management policy for SCPR operated trails. Skagit County Parks & Recreation Comprehensive Plan: Goals and Objectives 4 - 5 ƒ
- Coordinate with regional subarea plan processes to assure trail connectivity objectives are being accounted for.

In addition, this plan's Level 1 (highest priority) is:

- Other Trail Development and/or acquisitions

The section entitled "RECOMMENDED TRAILS PLAN" notes that, " **Trails continue to be the most demanded recreational facility asked for by Skagit county residents.** The 2007 State Comprehensive Outdoor Recreation Planning (SCORP) surveys show similar trends. The (SCORP) document makes recommendations for local agencies and encourages trail opportunities. **The plan specifically states, "If there is a weakness in the local response statewide, it may be in addressing high-participation activities that take place away from a traditional park, especially bicycling and walking. Health professionals increasingly regard walking and bicycling, both for recreation and transportation, as valuable tools that can help people build healthier lifestyles. Community oriented trails, paths, and routes for walking and cycling can encourage people to participate in health oriented activities; encourage children to walk or bicycle to school; and encourage adults to commute without a car"**

For more information on how trails can benefit Skagit County, please view Cascade Bicycle Club's report, "The Benefits of Bicycle and Pedestrian Projects: Quantifying and Prioritizing Non-Motorized Transportation Investments" at https://issuu.com/cascadebicycleclub/docs/cascade-tptguide_2012/1

Thank you,

Kasey Bell
45501 Main Street
Concrete, WA 98237

From: Bell, Marjorie
To: PDS comments
Cc: Jason Miller (goodwords@frontier.com); Hawk, Carol; Liz McNett Crowl
Subject: Comprehensive Plan 2016 Update
Date: Wednesday, April 13, 2016 3:27:13 PM

Hello Skagit County Planning Department Staff:

First of all, thank you for your tireless efforts on behalf of Skagit County residents. I appreciate all that you do! My comments about proposed goals, policies, and recommendations in the 2016 Skagit County Comprehensive Plan update are in support of language that recognizes the importance of trails to benefit health, the environment, and the economy. Please retain the proposed language in the plan (highlighted in yellow; new text underlined) for improved personal, environmental, and economic health for everyone.

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Thank you,

Marjorie Bell
45501 Main Street

Concrete, WA 98237

Marjorie Bell, Program Planner
Community Health Outreach Programs
United General District 304
2241 Hospital Drive
Sedro-Woolley, WA 98284
360-854-7172

Note - you may notice my email is from MBell@peacehealth.org. This is only a temporary due to recent transitions. Please continue to use marjorie.bell@unitedgeneral.org. Thank you!

This message is intended solely for the use of the individual and entity to whom it is addressed, and may contain information that is privileged, confidential, and exempt from disclosure under applicable state and federal laws. If you are not the addressee, or are not authorized to receive for the intended addressee, you are hereby notified that you may not use, copy, distribute, or disclose to anyone this message or the information contained herein. If you have received this message in error, immediately advise the sender by reply email and destroy this message.

From: Margaret Breen
To: PDS comments
Subject: Skagit County 2016 Comprehensive Plan Update
Date: Thursday, April 14, 2

RE: Guemes Island Subarea

Good morning. We are the owners of 20 acres in the Clark Point subarea of Guemes Island. We are one of the few owners who have put private property into Open Space preservation and use on Guemes, and we are hoping to put more in to preserve the character and livability of this special place. We support wholeheartedly the recommendations in the proposed subarea plan to monitor and restrict further water use and take ohter measures to preserve the rural character of the area.

WATER USE in the area is already stressed and we and neighbors have experienced well failure. We have had a near-dry well at times even with minimal use, and are closely monitoring sea water intrusion. The area now has significant commercial traffic as a result of yurts not subject to building permits (with shower and kitchen pavilions) tripling overnight population in the dry season, and an advertised base for a food truck that is now a semi-permanent restaurant. In addition, the resort is advertising for conferences and special events that draw large daily populations, further straining a limited resource. The area is clearly at or beyond capacity now.

SEPTIC SYSTEMS – The increased traffic strains septic systems in a an area with a high water table.

FIRE. Residents have perceived an increased number of beach fires and illegal fireworks, particularly during special events. When combined with summer water shortages, this is a critical concern.

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Friends of Skagit County
PO Box 2632
Mount Vernon WA 98273-2632
• Common Good • Common Goals • Common Ground •

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SKAGIT COUNTY
PDS

April 14, 2016

Skagit County Planning Commission
Skagit County Planning & Development Services
1800 Continental Place
Mount Vernon, WA 98273

RE: Comments on the proposed 2016 Comprehensive Plan update and related documents.

Dear Planning Commissioners:

Friends of Skagit County submits the following information to you for review and consideration in your deliberations and recommendations on the 2016 Comprehensive Plan (CP) update to the Board of County Commissioners (BOCC). The BOCC appointed the Planning Commission (PC) as the Citizens Advisory Committee (CAC) for the CP update. We assume you are serving as both the representatives of the citizens as well as evaluators of your own advice to the BOCC. This process is unlike when an outside CAC is appointed and you, as the PC, review their work. We therefore urge you to add information, where appropriate, to make clear in your recommendations to the BOCC when a proposed change is from the public, staff or is your own recommendation.

General Comments

We are submitting our own comments and some from members of the public who brought some of these parts of the CP to our attention. Should you need more or different information, please contact us.

The comments are with regard to the 2016 Skagit County Comprehensive Plan 2016-2036 (Public Comment Draft 03-04-2016 tracked version) unless otherwise referenced. The lack of comments on certain sections should not be construed as acceptance. We reserve the right to submit additional informal comments to complete this review.

The 2016 CP update process should update and clarify sections (when needed) to produce an updated plan that clearly defines allowed land uses, creates certainty for investment, protects the environment and conserves the natural resources based economy. The aim is to keep Skagit a rural county into the future while managing growth appropriately.

The timeframe for review of the CP and related documents was compromised by the Shoreline update. The County's schedule for the 2016 update should have followed the timeframe used by Anacortes for their comprehensive plan update and started the CP update in 2013. We recommend appointment of a CAC as well as citizen sub-committees for any future CP update.

Staff identification of sections (goals, headings, etc.) needing additional information, clarification of definitions and the addition of references all appear to help readers in understanding the plan. Some of the sections cited as not having goals, may be because many of the goals are written as methods to achieve a goal.

Proposed Development Regulations changes were not given separate public notice or a public work session for open public discussion of the changes. While this may not be required, the concern is that the public has not had the opportunity to fully review and comment on these changes.

Goals in any Comprehensive Plan should be measurable. Citizens, staff and elected leaders have no way to determine whether the proposals included in the 2016 CP update will succeed in meeting these goals. Nor is there a way to determine if the past goals carried forward were met. Most of the goals in the 2016 CP update are from the original CP. We recommend the County consider a yearlong citizen led review of the goals to re-write them with metrics that can be replicated in future updates.

The proposed CP update is sometimes missing references to related plans and documents that are often contain essential information relating to the CP goals and policies. For example the County's Natural Hazard Mitigation Plan and the County Stormwater Plan is mentioned but without an active link in the web version. We suggest an additional appendix with links and an explanation as to how to obtain print copies of these important plans be added.

We note that a thorough and complete review of the 2016 CP update and supporting memos, transcripts of PC and BOCC meetings, referenced documents, RCWs, WACs, Federal laws and regulations and other documents was not possible in the 60 day review period. We suggest the PC consider extending the public comment period for 30 days and during that time hold work sessions that are open to the public to clarify questions.

Comments on Sections of the Plan

Page 37: Please change "More and better incentives" to "Other options and incentives". Please add economic incentives to this list. Please remove the word "toolbox" and "tools" use the word "method".

Page 41 – The proposed changes to the Countywide Planning Policies (CPP) should make decisions concerning sizes and uses in urban growth areas and coordination with the cities more efficient. Note: There has been no work session or public discussion session on the CPPs.

Page 43 - [The policy further defines the process for consideration of sites for specific major industrial developments outside of urban growth areas.] (CPP 2.9). Comment – Is this a footnote to CPP 2.9? Does location of major industrial developments outside of UGAS comply with GMA?

Page 44 – How will the long-range cumulative effects of proposed uses on the environment, both on and off-site be measured?

Page 47 – Please note "(same as city/town limits) beside towns where UGAs are the same as municipal boundaries. Add also page 67.

We assume the requirements in Policy 2A-1.6 have not been met.

Page 53 – Open Space. Please see additional discussion of the SC UGA OSP further in these comments. Goal 2B Goal B Open Space - Please correct "Recognize the important functions served by private and public open space, designate and map public open space of regional importance, and designate open space corridors within and between urban growth areas." to reflect the language in the settlement. "…conserve open space areas, greenbelts and corridors within and between UGAs…" (not around).

We suggest clarification of this goal to reflect the mapping of open space proposed in Policy 2B-1.1.

According to the introduction to Open Space only public open space areas (including those of regional or statewide significance) are included on the CP/Zoning Map. The settlement agreement does not specify whether only public open spaces should be mapped. We appreciated that by not mapping open spaces such as private resource lands, the public is not misled into thinking private lands are available for public access. However by not mapping private open spaces, the County and the public does not have a full picture of the current UGA open spaces and the OS corridors between UGAs. We suggest adding language to the plan and/or code that require consulting a map and list of both public and private OS lands when parks, critical areas, trails, habitat or other OS identified projects are proposed to avoid unnecessary purchase or acquisition of OS lands by the County.

The Department of Commerce (DOC) checklist states: "**Identification of open space corridors within and between urban growth areas**, including *lands useful for recreation*, wildlife habitat, trails, and connection of critical areas." *Emphasis added.* We assume that "recreational lands" could be open space; however this is not completely clear in the definitions.

13b. of the DOC checklist lists ".... open spaces, parks and recreation, and playgrounds; and schools and school grounds. WAC 365-196-820(1)." when discussing codes for proposed subdivisions.

The Capital facilities plan identifies parks and recreational facilities that we take to mean built structures or changes to the lands created for recreational purposes. The CP should be changed to address this.

Page 54 – Ika Island is a privately owned island managed for forestry. Since the mapping for OS did not included private open space we suggest the removal of this property. Please double check the ownership of these properties.

(a) Neighborhood and community parks. These should be linked by open space networks whenever possible. Comment: There is no definition of OS networks. What does this mean? Actual physical connections, adjacent OS?

(d) Areas that take advantage of natural processes, wetlands, tidal actions and unusual landscape features such as cliffs and bluffs. Please clarify the safety, ecological and geological hazards of public access to cliffs and bluffs, public or private.

Page 55 – Implementation of the SC UGA OS plan should not occur without further editing to separate existing from the conceptual areas and further clarification to ensure private OS is considered in the future planning for acquiring OS land within and between UGAs. The plan also lacks a way to measure the effectiveness and the cumulative impacts of open space lands on the landscape as well as economic impacts.

Page 59-60 – Please qualify that the remaining farmland must have a conservation easement or other deed restriction.

Page 60 – We agree that Planned Unit Developments should only be located inside UGAs.

Page 62 – Essential Public Facilities. Please consider adding some assessment of the economic and cumulative impact of such facilities be done before their development begins.

Page 73 – Is the County Waste and Recycle facility an essential public facility, and/or water or waste treatment facilities?

Page 76 – We do not favor locating new rural commercial or industrial facilities in existing Rural Villages and Rural Centers without more criteria to be certain their location does not compromise the rural character. Residents must be involved in any proposed development and have final approval or rejection of these projects. The same additional criteria and policies for siting are needed for major industrial developments outside UGAs.

Page 80 – The language explaining the "missing" goal can be re-written to be the goal. Also page 82.

Page 82 – Extension of public water services should be vetted to consider the impacts that public water will have on septic systems, especially in geo-hazardous areas, steep slopes, shorelines and critical areas. Further, an analysis of any proposed ULID should include economic effects on land values, taxation and promotion of sprawl.

Page 91 – Rural Village. Please add language that allows the residents of the proposed new village to determine the development of their community.

Page 95 – The timeline provision for permit completion was added to prevent speculative purchases of land and to promote orderly development. Does the removal of a performance timeline promote speculation?

Page 103 – Please put the explanation for the removal into the document so there is acknowledgement that agricultural and industrial processing is being addressed, rather than removing the concept entirely.

Page 112 – 113 – Does this language reduce the current level of protection of resource lands?

Page 125- 126. Please add the suggestions of the PC to include legally permitted rainwater catchment systems from above in the document.

Page 130 – Good addition to help keep farmland in farming in rural resource lands.

Page 132-133 – Please add a policy on non-conversion of Ag-NRL until an economic analysis of the effects of cumulative loss of land for long-term food security is completed and a program for future food production is established.

Page 137 – Please add an economic analysis of the effects of the loss of farmland to the criteria considered. Add any legal requirements for de-designation so that the public understands this is a rare (if ever) event in Skagit County.

Page 146 – Wildfire planning should be coordinated with other requirements of the CP. Example: The Firewise program often removes understory plants from land, which would be detrimental to areas concerned with geo-hazards, shorelines and/or stormwater management.

Page 153 – Heading suggestion: Conservation of Rural Resource Lands.

Page 159 – Please add topography and geology as criteria for designation. Also there is no language concerning de-designation of MRO in streams, for example, or the process for de-designation.

Page 174 – Was the NR Clearinghouse a requirement of legal action? What is the rationale for changing the "shall" to "should"?

Page 177 – Ag NRL – Should include a discussion of conversion of farmland to others uses compromising the long-term food production security.

Page 180 – Was the addition of the area east of the Fire Mountain Boy Scout Camp added by request and was it reviewed as part of an annual update to the CP?

Page 198. We disagree that the older plans should be removed and request that they be referenced in an appended list of historical and current plans with links for web access and information on how to obtain paper copies. BAS does change over time; however, new science is almost always built on older science and these plans can often reduce costs and duplication of research, staff work and provide continuity for policies and programs.

Page 220 – (k) Please add phrase allowing legal rainwater catchment systems as a criteria for development consistent with Rural section.

Page 208 – Fish and Wildlife Conservation Areas. Please add (x) Public tidelands outside of dikes should be considered for restoration using appropriate scale dikes or other structures that would create long-term habitat and reduce the loss of productive farmland being converted for fish and wildlife habitat. Include consideration of the long-term economic consequences of food production loss to the county, region and state in evaluating tidelands for habitat.

Page 214 – Is there a timeline for the "comparative review" of shoreline policies and regulations to GMA?

Page 221 – The County should plan a public process to review and revise, if needed, the CPPs before the next CP update.

Page 228 – Manufactured Housing. Add "and other applicable local laws".

Page 229 onward. Suggest the chapter follow the same format as other chapters and the data and information that has been added to the plan be placed in an Appendix on Housing, rather than in the plan.

Page 261 - Transportation Element Comments

We request the removal of the eleven proposed projects (listed without numbers) that were added to the Transportation Technical Appendix (TTA). The TTA was not noticed in the BOCC docketing. These projects have not received public notice, review or comments.

Page 264 – Consider adding a CPP recognizing the need for design and construction of roads to safely accommodate farm and other heavy equipment.

Page 274 - "policy 8A-7.3 Encourage the enhancement and expansion of freight rail service to and from economic activity centers." Please add: "Encourage the return of the Sedro Woolley to Concrete rail corridor to active rail use to revitalize east county's economic recovery."

Page 282 – Public Involvement. Work with the WSDOT to provide public review and comment on transportation projects proposed by the state for Skagit County. Currently there is no local citizen review and comment of these projects, nor any appeal process.

Page 284 – Transportation Profile. Suggest keeping format like other chapters and creating an appendix for detailed information.

Page 312 – Criteria for extension of public water supplies is not included. Add legally permitted rainwater catchment systems as a way to permit development.

Page 314 – (ii) Add reference to rainwater catchment systems or footnote.

Page 315 – Limitation on uses and densities. Add, "…where connectivity can be scientifically proven."

Page 325 – Add incentives for residential and commercial solar installation offered by PSE and/or others (HUD).

Page 360 – Add policy to allow tourists to contribute to programs to conserve the rural character of Skagit County like the Farmland Legacy Program through tax-deductible contributions.

Page 364 – Ports 11F-3.2. Revise to reflect the legal role of the port – to provide infrastructure for economic development – and clarify that economic development is the role of EDASC and the two must be coordinated.

Page 376 – Agriculture. Please revise the statement about "largest sector" to explain what this means. As we understand it the sector is still the largest economic driver in Skagit County. To our knowledge it has not been the largest employer at all times.

Please leave in the sentence about "other significant crops".

Add page 376 – Asian vegetable seed % of world's seed.

The increase in small farms and demand for organic food is not the cause of diversified crops in Skagit County. Please revise. Skagit County has always been diversified with over 80 different crops grown in up to 3 season rotations.

Page 380 – Utilities. Please add the other systems that supply water to rural Skagit including the City of Anacortes and the numerous small water systems.

Page 382 – County Weaknesses – Consider adding a sentence on in-commuters who are supplying the workforce, presumably because the local population does not fill those jobs.

Page 403 – Community Plans. The missing goals can be written from the sentences below the goals.

Page 411- Subarea Plans – Should also state that the subarea plans are available upon request to PD&S, not just on the website. We suggest making at least one copy of the CP update, including referenced plans be available at public libraries.

Appendices – Comments

Technical Appendices under separate cover are not all addressed in the 2016 CP update. For example, Skagit County Coordinated Water system Plan – Regional Supplement, 2000 and any additional updates is not included.

Page 441 - Appendix B – Milestones in the CP process should be updated and remain in the CP appendices.

Page 451 - Citizen Advisory Committees in the 1997 Plan – please add the members of the CAC for the subsequent updates, including the members of the PC appointed for this update as the CAC.

Page 412 - Acronyms

We understand the need to update agency names and acronyms for current accuracy; however, we request that in cases where the titles have changed, please include the former name and acronym for reference. Example: Department of Commerce is now DOC but someone looking for CTED – Community, Trade and Economic Development may not know the new name.

Please use the complete name of the agency at least once in the document. Example: Skagit County Public Utility District #1.

Page 415 - Definitions

The addition of GMA language helps clarify these. Has staff verified that the language in the definitions supports and/or clarifies any federal, state or other local laws as written? Definitions used in the Skagit County Code (SCC) should be referenced in the CP when the definition is necessary to understanding the CP and/or the SCC. Example: "vesting". C-1 Vesting of Applications. Vesting is not included in Title 14 of the SCC. The public has no way the public can know how vesting applies to the CP or the SCC without reading the changes in the RCW.

Please leave the references to the legal descriptions in the definitions. Example: Act – the Growth Management Act. Reinstate – "….as enacted in chapter 17, Laws of 1990, 1st Ex. Session, and chapter 32, Laws of 1991, 1st Special Session, State of Washington…." or other language allowing the public to know where to find the documents and law that is referenced.

Page 436 – please add "…persons with chronic illnesses like multiple sclerosis who receive qualified disability services and support." to this list. Also, physically disabled, like those using walkers, wheelchairs and the like.

Page 427 – Land Conservation – please add "for the future" or some other temporal language that shows the conservation is considered over a period of time or for future use.

Page 423 – Ecological function is not solely land, but the inter-relationships between biological species, man and environment. Definition needs revision to be more accurate.

Page 418 – Capital Cost – change is more accurate.

Page 416. Agriculture and Agricultural land – leave in the RCW reference in parentheses.

Page 417 – BMP definition should agree with state or federal definition. Example: DOE Storm and Surface Water BMP says: "Best Management Practices (BMPs) are a method by which the adverse impacts of development and redevelopment are controlled through their application. BMPs are defined in the state's storm water Manual as 'schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants to waters of Washington State.' The types of BMPs identified by the state are source control, runoff treatment, and flow control.

The primary purpose of using BMPs is to protect beneficial uses of water resources through the reduction of pollutant loads and concentrations, and through reduction of discharges (volumetric flow rates) causing stream channel erosion."

Appendices Removed Should be Re-instated

Appendix C – Descriptions of related plans, studies and regulations

While the staff may think that this section is not important, Appendix C gives an uninformed reader part of the history and background needed to understand the current and past CPs. Even though some of this information is integrated into the 2016 CP update, we suggest that staff update this Appendix to include in the 2016 CP update to provide better access for the public to public information.

Appendix D – Adopting and Amending Ordinances

Staff cannot overlook the value of updating these to not only provide history and perspectives on Skagit County Comprehensive Planning, but also to provide a chronological reference for public access to past County planning. Not providing this appendix requires a citizen to have access to and a working knowledge of Skagit County's early planning activities and documents and Skagit County ordinances and resolutions that apply to land use decisions. Citizens should have access to these decisions without requiring extensive searching, and staff have the ability to update this document with very little work.

Technical Appendices that were under separate cover are not all addressed in the 2016 CP update. For example, Skagit County Coordinated Water system Plan – Regional Supplement, 2000 and any additional updates is not included. We suggest at the minimum a list of these publications with URL links and/or information as to how the public can obtain a paper copy.

Staff Proposed Changes to the Development Code

C-7 Cleanup: Watershed management. The term should be defined and remain in the CP because of state agencies use of the term in regulatory and planning activities such as WRIAs.

C-9 CaRD Density Shifting – We support clarification to prevent historical mis-use continuing to future CaRDs.

C-10 removal of the term "unclassified uses". Is the term in the GMA and/or other state laws and should it be retained in the CP, rather than removed?

C-12, C-13 and C-14 were developed to protect NRLs from litigation about activities on these lands. We would not want changes of these requirements to diminish the protection and conservation of NRLs.

C-31 Storage of Junk and C-32 Recreational Vehicles. We are concerned that the definition of "junk" and the requirement of more than 500 sq. ft. on a parcel to be fenced may be read to include artists' sculptures or student projects. Requiring a legally established business for compliance may put some of these citizens in violation of this regulation. The requirement in New Section 14.15.945 (3) (a) "No person may use a recreational vehicle as a dwelling unit" appears to prohibit use of an RV as a temporary dwelling on a building site. Section (3) (b) "No person may occupy a recreational vehicle for more than 180 days in any 12-month period" appears to preclude the use of an RV in state park RV sites. More clarification is needed to determine how these proposed regulations would apply to Homeowners Associations, RV park businesses, summer camps and other recreational gathering places. Section (3) (c) and (d) specify ".... more than one..." and "...more than two..." respectively as the limits of recreational vehicles on any lot without a special use permit for that purpose. Please clarify this language so that persons restoring, repairing or needing proximity to their RV for various purposes would not be required to apply for and receive a special use permit. As currently written making violations of this regulation a Class 1 Civil Infraction with a possible penalty of $250 reads more like a revenue scheme rather than an attempt to clean up junk.

C-34 Rural Business. Limiting expansion of rural businesses should encourage rural businesses that need additional space to relocate to larger existing facilities or urban areas. The regulation does not limit the number of expansions possible, but relies on a maximum size allowance based on existing use as of 1990.

NC-1 Maximum Lot Coverage in Rural Reserve. The sliding scale amounts of coverage are an improvement over the 35% lot coverage blanket approach. We assume the maximum lot coverage was determined from other rural codes and that the requirement does not apply to existing development in this zone. Given that some number of acres of Rural Reserve is used for agricultural purposes that may require temporary or permanent structures such as greenhouses or processing sheds, we suggest that an exception for agricultural uses be added. We assume the county no longer sites marijuana production facilities in Rural Reserve.

Comments on Public Process

Public notice did not include amendments to the Shoreline element of the CP. R20140374 Attachment 2 did list the SMP under the proposed amendments to the Skagit County Code (SCC). We assume the Shoreline Master Program (SMP) will be docketed, in whole or in part, or incorporated by reference into the Shoreline element of the CP at a future date.

The County has never completed the South Fidalgo Sub-area plan required by a number of GMHB appeal final decisions and orders. We suggest the county secure grant funding and/or put this plan in the next budget cycle so that it can be completed.

Proposed Map Amendments Comments

City of Burlington UGA (CP-2). The Raspberry Ridge development was located in the County due to the donation of the property by farmers who recognized the need for farmworker housing. The City of Burlington approved the expansion and annexation of the development. The city argued that Raspberry Ridge needed sewer hook-up to solve a public health issue; however, the County failed to regard its own policies prohibiting or limiting floodplain development by locating residential development in the floodplain. At a minimum, if the Planning Commission approves this expansion the PC should require (as a condition of permission) Burlington remove an equivalent amount of acres from its UGA in order to keep its UGAs sized to its projected future development need.

Comments about other plans

A series of planning documents related to watershed, drainage or stormwater management, which must be used in planning, are either omitted or not referenced in the 2016 CP update. These include: Samish Watershed Action Plan, 1995; Nookachamps Watershed Non-Point Action Plan, April, 1995; Big Lake Drainage Management Plan (and other drainage management plans); Padilla Bay – Bay View Watershed Non-point Action Plan, 1995; South Fidalgo Island Stormwater Management Plan, 2010. We suggest an appendix for these documents.

The public notice stated the 2016 CP update was to: Incorporate by reference existing subarea plans, the County's Parks and Recreation plan, and the Capital Facilities Plan, and consolidate appropriate components into the Capital Facilities Element.

The staff report stated the BOCC resolution directed: Integrate existing subarea plans, the Skagit County Parks and Recreation plan, and the Capital Facilities Plan with the Comprehensive Plan…

Page 70 – Open Space Areas. The Skagit County Urban Growth Area (UGA) Open Space Concept Plan (UGA OSCP) (2009) was adopted by Resolution by the BOCC, although the PC recommended against adoption. We request that the full and correct title of this plan be used in referencing the plan in the CP. Please add a sentence in the introductory paragraph for this section stating that not all open space is open for public use.

To date the plan has not been included in any Comprehensive Plan update process except its addition at this time. The SC UGA OSC plan been not been implemented, nor should it be in its entirety and not without further review and editing to clarify which parcels and areas identified are existing open space and which are proposed ideas that were included in the plan. The SC UGA OSC is not included in R20140374 scoping list by the BOCC.

Implementation of this plan as written is problematic given the lack of definition, clarity and policies to ensure protection of Skagit's natural resource lands.

We understand the SC UGA OSC was developed as a requirement to settle Growth Management Hearings Board cases that involved a ruling to include identification and mapping of existing open space among other requirements. The GMHB said:

> Counties are required to identify "green belt and open space areas" within UGAs and to "identify open space corridors within and between" UGAs. Official maps, which do not show these areas fail to comply with the GMA. Evergreen Islands, et. al. v. Skagit County 00-2-0046c (Final Decision and Order, 2-6-01).

The compliance order stated: (9) Within 180 days, **adopt maps** or some other clear mechanism **to identify** greenbelts and open space areas within UGAs and open space corridors within and between UGAs. Evergreen Islands, et. al. v. Skagit County No. 00-2-0046c, Compliance Order – General Issues. **(Emphasis added.)**

RCW 36.70A.110(2) requires counties to include "greenbelt and open space areas" in its UGAs.
RCW 36.70A.160 requires counties to "identify open space corridors within and between urban growth areas."

Open space corridors is not defined in the CP. The public may interpret this to mean a path or trail for human use when the original intent may have been for wildlife. or critical areas.

We recommend that if the plan is included in the 2016 PC update, some qualifications be attached to the inclusion. Portions of the plan fulfill the requirements and other parts of the plan were not required by the agreement and over-reach both the order and its intent. We ask that the PC recommend further qualify the inclusion of the plan by requiring an update process for the SC UGA OSC Plan in the next two years.

Other Comments

Maps of Samish basin do not include the designated floodway.

Please remove the word "toolbox" and "tools" when describing land use methods and use the word "method", "planning methods", "choices" or other suitable describing word. Despite the use of this term in planning circles, we think the public prefers plain words when these suffice.

Thank you for your time and consideration. Should you have questions or need additional information, please feel free to contact us.

Yours sincerely,

Ms. Ellen Bynum
Executive Director

EB/
cc: FOSC Board

05 April, 2016

Submission of Comments Regarding Skagit County Comprehensive Plan 2016 Update

RECEIVED
APR 05 2016
SKAGIT COUNTY
PDS

Property Owners Name & Address:

CALVERT WILSON D & CALVERT LORI A
13507 ROSARIO RD
ANACORTES, WA 98221
Lot # P19111

Proposal Name: Comprehensive Plan 2016 Update

As a resident and owner of the property P19111 adjoining the proposed expansion of the Mineral Overlay to Parcels 19158, 90028, 19165 and 19164, I find this change in property use a **real and material threat to the peaceful nature of the surrounding properties**.

As you know, the current use of the Sand and Gravel mine (The Lake Erie Pit) includes large earth moving equipment, heavy trucks entering and exiting along Rosario Road, gravel processing equipment and the frequent use of the pit for firearm shooting and other activities. All of these activities are noisy and potentially hazardous to nearby residents.

Since my property and residence abuts the proposed expansion directly, any use of the Pit closer or directly adjacent to my property would clearly impact my quality of life.

When I purchased my property, I researched the restrictions regarding Rural Intermediate Areas and limitations (See Policy 4D-1.3 (d)). They are very clear in their intent.

Expanding the MRO and moving the operation closer to the existing RI areas would clearly violate this zoning policy.

I would note that the argument used by the County Review Board to grant the current Special Use exemption to the existing operation of the Lake Erie Pit in no way justifies further expansion of already misplaced zoning (less than ¼ mile from existing RI areas).

This logic would undermine any existing zoning by the issuance of a "Special Use Exemption" based on the amount of influence the owner of the property wields with the County Zoning Department. This clearly undermines the concept and protections provided by zoning regulations.

The current operation of the Pit, in some manner or another, is already adversely affecting Noise and Dust Levels, Aquifer Degradation, Critical Area Destruction, Traffic and Road Impacts, Storm-water runoff and Erosion, Visual Impacts, Wildlife Impact and Reclamation issues. Little has been done over the years to address any of these issues, as the Pit has existed merely to ravage the land for the benefit of the owners.

Given the existing recommendation by the County to approve the expansion, it is more important than ever that the required Special Use Review report addressing impacts to the surrounding areas be properly conducted. All of the concerns mentioned are already being affected, and expansion would likely increase their future impacts on the nearby properties.

Having made the argument **against the proposed expansion to the MRO**, I am not opposed to the best use of this property. Properly administered, the Pit may continue to operate for some benefit of the community, albeit with even less impact and more benefit to the residents in the surrounding neighborhoods.

I implore the Review Committee to carefully consider all of the issues and concerns brought forth, keeping in mind the existing and future use of ALL the property owners in the area.

Regards,

Wilson Calvert
Owner

RECEIVED
APR 11 2016
SKAGIT COUNTY
PDS

April 8, 2016

Skagit County Planning Commission
Skagit County Planning and Development Services
1800 Continental Place
Mount Vernon, WA 98273

Re: Skagit County 2016 Comprehensive Plan Update/Guemes Island Sub Area Plan

Dear Skagit County Planning Commission:

We have been full and part time residents of Guemes Island since 1972 and have participated in various land use planning forums including the Guemes Island Planning Advisory Committee (GIPAC). We fully support GIPAC comments with respect to the Comprehensive Plan 2016 update. We ask that the County approve the proposals needed to implement the Guemes Island Sub-Area Plan.

The GIPAC sub area plan includes a zoning overlay to better reflect the historic small scale development and rural character of the island as well as the sole source aquifer limitations for potable water. Seawater intrusion is an issue on the island and therefor codification of the Seawater Intrusion Policy is a priority as well as considerations given to alternative water sourcing such as rainwater collection.

The resort located on the northeast corner of the island has recently purchased a ten-acre parcel (P#124186) for extension of their successful resort endeavor. At issue for adjacent land holders is increased water use and septic system load with respect to the sole source aquifer. A second concern is increased vehicle traffic and noise as a result of expanded venues such weddings in which as several hundred attendees may congregate on the site. The site is currently zoned Rural Reserve ostensibly intended for "residential use", however there is a long list of other "permitted or approved" uses to which the property could be developed, many of which are inconsistent with the intent of the Sub-Area Plan.

As previously stated, we fully support inclusion of the Guemes Island Sub Area Plan in the Compressive 2016 Plan Update.

Sincerely,

Stuart D. Charles

Arden S. Charles

4453 Guemes Island Road
Anacortes, WA 98221-9029

Peter Christ
28818 NE HANCOCK RD CAMAS, WA 98607
TEL 360-834-7022 FAX 360-834-9680
peteroboe@comcast.net

RECEIVED
MAR 17 2016
SKAGIT COUNTY
PDS

March 11, 2016

Planning and Development Services
Skagit County
1800 Continental Place
Mount Vernon, WA 98273

RE Comprehensive Plan 2016 Update

Thank you for your letter of March 9 indicating that our Skagit County property off Willida Lane is within 300 feet of property being considered for annexation by Sedro-Woolley.

We appreciate being kept informed about this.

We just received a letter from the Sedro-Woolley Planning Dept. that showed a map indicating that Willida Lane (and our property) is not in the growth area being considered.

That is fine with me.

We do not wish to be included in any expansion of the city of Sedro-Woolley. It is a wonderful little town and we love it but we are happy being in the unincorporated part of Skagit County. We do not need city services at this time.

Thank you for your consideration.

Sincerely,

Peter Christ

cc: Sedro-Woolley Planning Dept., 325 Metcalf Street, Sedro-Woolley, WA 98242

Debra L. Nicholson

From: CLANCEY <gclancey@comcast.net>
Sent: Thursday, April 07, 2016 11:57 AM
To: PDS comments
Cc: Commissioners
Subject: 2016 Comp Plan Update comments

RE: Non-Motorized Transportation.
2016 Comprehensive Plan Update.

Dear Commissioners & Public Works Dept.

Projects to be included in the Skagit County Comprehensive Plan Update must be openly reviewed by the public and presented to the County Commissioners at a public hearing before they can be legally added to any Comp Plan, which includes the Transportation Improvement Program.

I have discovered **11 Projects on pages 58,59,60** of the Transportation Element Technical Appendix that conspicuously have no I.D. numbers. It appears that these non-motorized projects have never received the required public scrutiny, and thusly **must be removed from the Comp Plan.**

Since SCOG has revealed that 90% of Skagit commutes are done by auto, and we all know that business and agricultural goods are delivered by truck, not bike, the Commision and Works Department would be better serving our community by using our limited transportation funds for road and bridge maintenance and upgrades that are essential, rather than for bike trails, used by very few, that are recreational.

Gary Clancey
3351 Green Cliff Rd.
Anacortes, WA 98221
Skagit Co. Comm. District 1

From:	Paula Clancey
To:	PDS comments
Cc:	Commissioners
Subject:	2016 Comp Plan Update comments
Date:	Friday, April 08, 2016 8:47:32 AM

RE: Non-Motorized Transportation.
2016 Comprehensive Plan Update

Dear Commissioners & Public Works Dept.

11 projects on pages 58, 59, 60 of the Transportation Element Technical Appendix have no I.D. numbers and therefore should be removed from the Comp Plan.

Paula Clancey
3351 Green Cliff Rd.
Anacortes Wa 98221
Skagit Co. Comm District 1

From: Debbie Clough
To: PDS comments
Subject: Comprehensive plan 2016 update
Date: Wednesday, April 13, 2016 6:28:20 PM

Debbie Clough
328 N 7th
Mount Vernon, WA 98273

Please include ways in which cyclists & pedestrians can safely go about their business in Skagit County. Include benchmarks so the effectiveness of the plan can be measured.

Sent from my iPhone

From: Liz McNett Crowl
To: PDS comments
Subject: Comprehensive Plan Update 2016
Date: Thursday, April 14, 2016 2:48:03 PM

Comments on proposed "Comprehensive Plan 2016 Update"
Planning and Development Services
1800 Continental Place
Mount Vernon WA 98273

April 14, 2016

Skagit County Planning Commission
c/o of Skagit County Planning and Development Services
1800 Continental Place
Mount Vernon, WA 98273

Dear Director Dale Pernula and Planning Commission Members:

I am writing to offer comments concerning the Skagit County Comprehensive Plan 2016 Update.

I believe that implementation of the Skagit Countywide UGA Open Space Concept Plan is long overdue. I support adoption of Policy 2B-1.3 and the implementation of the Skagit Countywide UGA Open Space Concept Plan. When well-designed and maintained, open space provides a buffer between urban and rural areas, as well as a variety of environments that benefit human health, wildlife habitat, water and air quality, and opportunities for non-motorized transportation and recreation. We need the natural separation of planned open space.

I also strongly support the Comprehensive Plan's inclusion of policies supporting non-motorized transportation. The proposed plan includes a number of attributes that demonstrate that Skagit County is on track to support a multimodal transportation system that will provide for the transportation needs of our residents and visitors for the next 20 years.

In Chapter 8, the Transportation Element, new or revised Policies 8A-6.4, 8A-6.6, 8A-6.11, and 8A-6.12, as well as several paragraphs of new narrative regarding non-motorized transportation in the Profile section and the revised Appendix C, are all key elements of a comprehensive transportation plan that strives to serve the needs of all users. I have voiced my concern in the past for the lack of transportation planning, especially for non-motorized users, in our rural communities and sub areas of the county, and I am especially pleased with the inclusion of Policy 8A-6.11 to address this.

During the Public Hearing for the 2016 Comprehensive Plan Update, I heard comments that the only projects that can be listed in the 20-year plan are ones that have an "ID Number" and have been formally added to the 6-year Transportation Improvement Plan (TIP). In the introduction to Section 5.7, it states, "This list includes projects from the County's 2016-2021 Six-Year TIP as well as projects anticipated beyond the six-year time frame." This implies that projects don't need to "have an ID number" or "go through process". I request Planning Staff clarify this point with the Planning Commission and adopt the list as it is in the draft.

From this list, projects for the 6-year TIP can be selected when they are needed and/or there is a specific funding source to pay for them. Not including them would disproportionately affect non-motorized users, who are the vulnerable road users, and would limit regional mobility. We don't want a plan that limits us, we want a plan that shapes and envisions a better future!

I would also like to address property rights issues, which have been repeatedly brought up especially in reference to open space, future trails and public access. I believe that a lack of a solid non-motorized plan and project prioritization process has contributed to these concerns. The Rails-to-Trails Conservancy sites lack of information and unanswered criticism of trail proposals as typical fuel for this opposition and leading to misconceptions,

including confusion related to property rights issues, concerns that property values will drop and liability will increase, and fears of increased crime such as littering, trespassing, burglary and vandalism. A large majority of trail opponents find that their fears about the trail never materialize, and numerous studies refute that trails increase crime, lower property values or introduce new liability claims. In many instances, adjacent residents become enthusiastic trail users and supporters within a few years of a trail's creation. The key is to address people's initial fears early and openly, and then opponents can begin to recognize the trail as a positive community amenity. I support the continued acquisition of property that enables our transportation network, especially regional trail corridors and routes to be expanded and open spaces to be created. Creation of an implementation plan is critical and a missing part of what is proposed in this draft Non-motorized Plan. I would like to see an implementation plan that includes goals, prioritization criteria, benchmarks and performance measures be added. Skagit County has an annual plan, budget and schedule for roadwork and should have one for non-motorized transportation as well.

As a resident of the Skagit Valley for over 50 years, a health professional for over 40 years, a mother of two active daughters, an avid hiker, walker, and biker, I am truly excited about the changes I see in the 2016 Comprehensive Plan Update. We are taking steps to make our county a healthy and vibrant place to live, work, and play.

Thank you,

Liz McNett Crowl

13797 Trumpeter Lane
Mount Vernon, WA 98273

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Saving Land for Tomorrow

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Jane Zillig
Land Specialist

GENERAL COUNSEL

Bradford E. Furlong, P.S.

April 14, 2016

Att: Comp Plan Comments

Dale Pernula, AICP, Director
c/o Skagit County Planning and Development Services
1800 Continental Place, Mount Vernon WA 98273

Dear Dale,

Thank you for the opportunity to comment on the Skagit County 2016 Comprehensive Plan Update.

The areas Skagit Land Trust addresses in our comments pertain to our vision and mission of protecting special natural and resource lands for the benefit of current and future generations of people and wildlife.

Urban, Open Space & Land Use Element

Policy 2A-62, which adopts plans, codes and development standards that promote public health by increasing opportunities such as adding pedestrian and non-motorized linkage, speaks to our constituency's vision for the future of Skagit County. Trails, bike paths and other pedestrian -oriented linkages are some of the top requests from our constituents.

We enthusiastically support proposed Policy 2B-1.3 revision to *Implement the adopted* Skagit Countywide UGA Open Space Concept Plan *to conserve open space areas, greenbelts and corridors within and between urban growth areas.* From the 2007 Open Space survey done by Skagit County *, to the significant support Skagit Land Trust receives annually from 1,500 local residents, to the strong citizen input during Envision Skagit 2060, it is clear that Skagit citizens *really want* clean air, clean water, and the protection of our open space. They want it for a combination of natural resource use, wildlife habitat protection, natural and rural vistas and for public access such as trails. And the good news is that all studies completed over the past two decades show that while open spaces including trails may generate less revenue than residential, commercial or industrial properties, they also require far less public infrastructure and few services. Open spaces generate more public revenues than they receive back in public services. But the financial benefits of open space to our community are icing on the cake (so to speak). The quality of life they render now and into the future is irreplaceable.

** A 2007 random statistically controlled sample survey of Skagit residents was conducted by an independent firm (Tom Beckwith, Beckwith Consultants, La Conner) for Skagit County during the Open Space Planning period. It shows overwhelming concern regarding the loss of Skagit County's open space around cities and towns. A majority of the respondents did not think existing policies and programs were sufficient to conserve and protect Skagit County's open space resources. The following data indicate strong local support for adoption and implementation of an Open Space Plan:*

P.O. Box 1017, 1020 S Third Street, Mount Vernon, WA 98273 Voice 360-428-7878 Fax 360-336-1079

- *73% of those surveyed agreed or strongly agreed that open spaces within the UGAs should be interconnected to flow through the cities into the surrounding countryside in a manner that provides some logical and visible corridor networks.*
- *70% agreed or strongly agreed that open space conservation efforts must do more than just preserve land – conservation programs should also restore, enhance, and manage the land to provide the valuable natural and ecological functions it once did.*
- *70% agreed or strongly agreed that the entry roads into and out of the urbanizing areas should retain an open and rural character ("rural by design").*
- *72% agreed or strongly agreed that Skagit County public access trail systems and park activities should extend from open space corridors within the urbanizing areas out into the countryside to access some of the most diverse and scenic features in the county and region.*

For the past decade, large-scale citizen input in Skagit County has consistently shown support for open space, trails and corridor linkages, particularly between and around our towns and cities. **It is time that we actually begin to implement Skagit County's UGA Open Space Plan. We support Policy 2B-1.3 and its subsets:**

a) Seeking to protect lands useful for recreation, wildlife habitat, trails, and connection of critical areas, and working farms and forests.

and

b) Achieving the above through voluntary donation, CaRD subdivision or mutually agreeable sale.

Environment Element

We applaud the inclusion of language Policy 5A-5.1(l) on considerations of changing climate conditions and the impact on frequently flooded areas. Acknowledging climate change and how it may or will impact Skagit County is imperative and makes economic sense particularly in flood-prone areas. It is inevitable that some of the low-lying areas of Skagit County will be threatened both for humans and for fish and wildlife as climate changes. We need to prepare for those changes.

The proposed language reads: "*When reviewing proposed developments or designing infrastructure, consider the potential effects of tsunami, high tides with strong winds, sea level rise, and extreme weather events, including those potentially resulting from global climate change, and apply conditions of approval to ensure adaptation to future conditions and mitigation of potential impacts.*"

The devil is in the detail as some conditions of approval or mitigation may assist one development but be destructive for future generations of humans and fish and wildlife on neighboring lands. The impact of climate change cannot be looked at only on a piecemeal basis. It must also be looked at on a comprehensive level to evaluate how all of our current and long-term plans will be affected by, or affect, climate change. The economic, environmental and human costs may be so profound that climate change should be at the forefront of any planning discussion affecting Skagit County's future. Over the years with adequate discussion and scientific input, we may find that many of the current policies in the comprehensive plan work in today's world, but some impede adaption to a changing climate and landscape. These are hard conversations but ones we must have as a community. As a start, having more information for the public on the County website, such as that provided by the Skagit Climate Science Consortium, would be helpful. Also the good work done by the 2009 Skagit County Climate Task Force needs to be brought to the forefront.

SKAGIT LAND TRUST
Saving Land for Tomorrow

Skagit County should become a leader on providing information on climate change for planning purposes locally.

We support the language in 5A-5.3 that strengthens the County's commitment to critical areas. We appreciate the work the County does to partner with willing landowners, conservation groups and programs to permanently conserve critical land in the floodways. This serves public benefits for fish and wildlife, open space and assists with flood mitigation.

Transportation Element

We support the additions to the transportation element and in particular policy 8A-6.11 that encourages communities and subareas to address the implementation of pedestrian, bicycle and (where appropriate) equestrian facilities that provide safe access to a variety of community locations and planned multi-use trails. We are strongly supportive of having a 20-year non-motorized project list with specific projects named such as the Centennial Trail. Although we understand that naming does not infer funding, having a more specific list is a transparent way of planning that community members and partners need in order to collaborate on projects and seek funding. We also note that there is brief mention in the Transportation Technical Analysis of trials on dikes. We know this is a complex topic and that some dike trails are either in progress or in use. However, furthering dike trials and linkages to them seems like an obvious location for future trail expansion with willing landowners. Skagit Land Trust is very willing to discuss this possibility with the County or Dike Districts on properties we own or anticipate owning.

Thank you for the opportunity to comment on the proposed updates to the Comprehensive Plan. We at the Land Trust have been impressed with the receptivity of County staff at local meetings and their responsiveness to citizen input. We have also received good reviews from our supporters for this process. If you have any questions about our comments, please feel free to contact me at mollyd@skagitlandtrust.org or at 360.428.7878.

Sincerely,

Molly Doran

Molly Doran
Executive Director
Skagit Land Trust

Carol Ehlers-

Skagit County Tax Base Acreage Distribution
Skagit County Assessor March 2016

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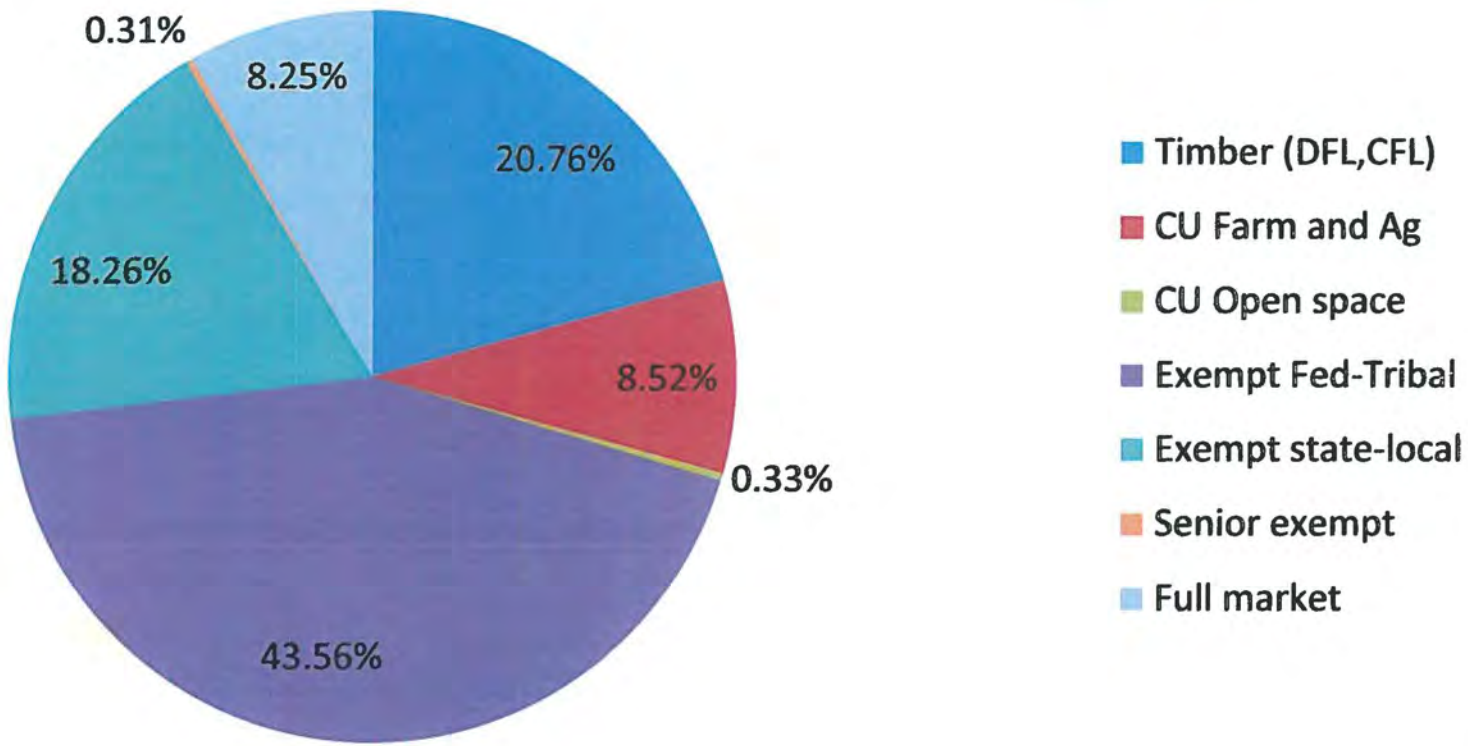
SKAGIT COUNTY
PDS



Carol Ehlers

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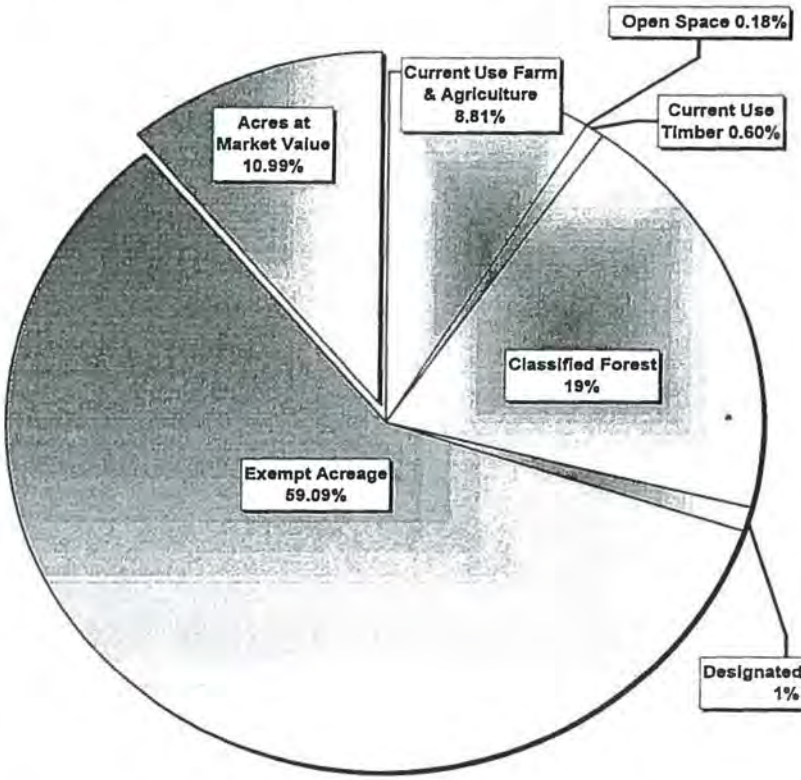
Ad Valorum Tax Base Acreage Distribution

Exempt Acreage

Exempt Acreage includes National Forests, National Parks, lands held in trust by the Bureau of Indian Affairs and all other Federally administered properties, State, County, City, Public School, Port, Hospital District, Fire District, Dike and Drainage district properties and Church properties. These properties pay no regular property taxes.



Tax Benefit Programs

Current Use Farm & Agriculture and Open Space are valued at a current use value as an economic incentive to discourage developement.

Open Space Timber, Classified Forest and Designated Timber are assessed at a very low per acre rate. Timber excise tax is paid when the timber is harvested.

Skagit County - Public Land, Township/Range Section

Cas & Ehlers

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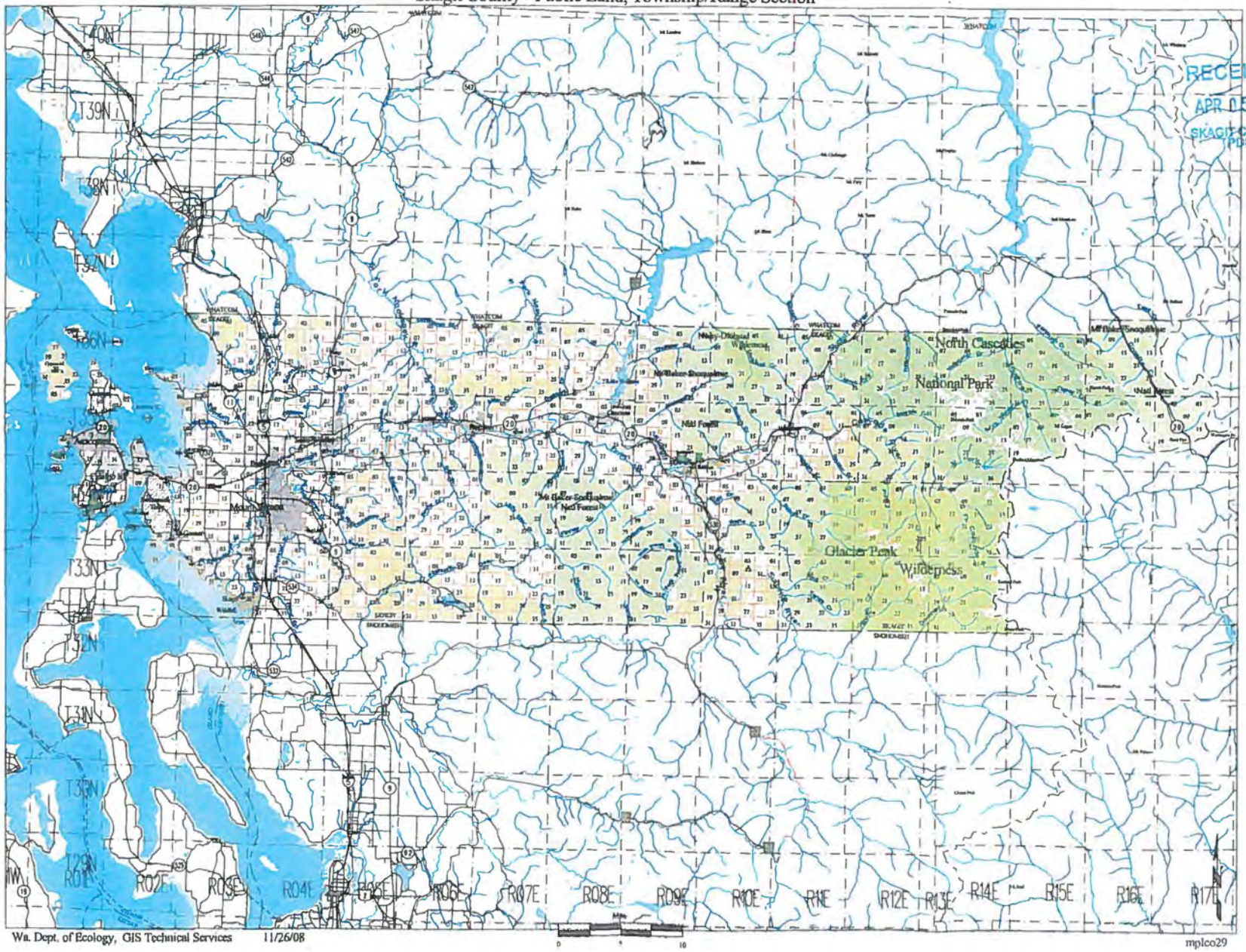
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Mt Baker-Snoqualmie Nat'l Forest
North Cascades National Park
Glacier Peak Wilderness
Mt Baker-Snoqualmie Nat'l Forest
Bellingham
Mount Vernon
Anacortes
Sedro Woolley
Concrete
Marblemount
Darrington
Arlington
Stanwood
Camano Island
Lake Whatcom
Lake Samish
Lake Cavanaugh
Lake Shannon
Lake Ann
Lake Sidney
Lake Ellen
Lake Tye
Lake Chelan
Lake Wenatchee
Lake Stevens
Lake Goodwin
Lake Ballinger
Lake Sammamish
Lake Washington
Lake Union
Lake Tapeto
Lake Kitsap
Lake Sawyer
Lake Tanwax
Lake Ozette
Lake Quinault
Lake Cushman
Lake Kachess
Lake Easton
Lake Keechelus
Lake Cle Elum
Lake Kenneth
Lake Roosevelt
Lake Pend Oreille
Lake Sammamish
Lake Washington
Lake Union
Lake Tapeto
Lake Kitsap
Lake Sawyer
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SKAGIT COUNTY
PDS

4/13/16

Attached are 35 pages of comments and attachments as evidence for the 2016 Skagit County Comprehensive Plan, UGA & Code. With adequate time there is much more to be said, especially about Fidalgo Island.

Carol Ehlers
3958 Windcrest Lane
Anacortes, WA 98221

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2016 Public Review Timeline for SMP, Comp Plan & Codes

I request additional time for public and Planning Commission to read, analyze and offer edits, as GMA requires. 1144 pages of Plan, Goals, Policies and Code cannot be reviewed well in several weeks.

Carol Ehlers

2/4 SMP legal notice
2/5 " Staff Report 10 pages } 207
" Draft Plan 197 "

SMP Watershed Consultant reports (no hearings, enforcement?)
9/11/11 Analysis Inventory 255 pages
7/8/13 Designation Maps 3 " } 349
2/26/16 Impact Analysis 77 "
2/26/16 No Net Loss Report 14 "
556 pages

3/3 Comp Plan Legal Notice
3/5 " Staff Report 23 pages
" " CCA 5 "
" Revised Codes 68 } 588 pages
3/4 " Text 452
? Transportation Plan ?

3/15 SMP hearing on 207 or 556 pages.

4/4 SMP comments due on 207 + 349 (3) pages
4/5 Comp Plan hearing on 588 pages.
4/14 " " comments due. " + Transportation.

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

Master Planned Resort (MPR)	113
Subtotal	[illegible]
TOTAL	82,26484.947

*Acreage figures are derived based on the best information and technology available. Accuracy may vary depending on the source of the information, changes in political boundaries or hydrological features, or the methodology used to map and calculate a particular land use.

The Rural area goals, policies, and land use designation criteria are included in the Rural Chapter, the companion document to the Rural Profile. The land use designations for the Rural Area allow for a variety of residential densities and rural- and natural resource-related businesses while protecting rural character. Several of these designations implement the Growth Management Act's allowance of "limited areas of more intensive rural development," or LAMIRDs, based on 1997 amendments to the Act. LAMIRDs allow greater development than is generally allowed in the rural area, provided that certain limitations are maintained to retain rural character and prevent sprawl. One category of LAMIRD recognizes areas that were already for the most part developed in 1990, when the Growth Management Act was adopted. These existing residential, commercial, or industrial areas primarily allow infill development, and must be contained within logical outer boundaries to prevent sprawl. Two other types of commercial LAMIRDs – small scale recreation and tourism uses, and isolated small scale businesses – may allow new development provided that development is contained and consistent with the surrounding rural character.

The residential land use designations in the Rural Area are:

- Rural Intermediate (RI)~~;~~
- Rural Village Residential (RVR)~~;~~
- Rural Reserve (RRv)~~; and~~
- ~~Bayview Ridge Urban Reserve (BR-URv).~~

All lands designated Rural Intermediate and Rural Village Residential are considered to be part of a LAMIRD that was predominantly developed by 1990 and contained by a logical outer boundary consisting of the "built environment." The Rural Village Residential and Rural Intermediate designations reflect areas that were for the most part already developed or platted at land use densities of 1 residence per 2.5 acres, or

No!

1 residence per 12,500 sq ft as of 4/86 SC Code attached. (14.04.050 1 .095)
Parcels platted from 1890 - 1945 were often smaller.

(e) Maximum height limit: 35 feet, unless limited FAA requirements.

(6) Special Provisions.

(a) All improvements shall conform to applicable federal regulations concerning dimensional restriction on air operations including height restrictions and required setbacks from air operations areas.

(b) Uses with the AVR zone located at Skagit Regional Airport are further subject to the requirements of Section 14.04.171 titled "Airport Environs" and Section 14.04.172 titled "Airport Height" of the Skagit County Code.

(c) All proposed uses within properties abutting agricultural or residential districts shall be reviewed by the Planning Department to assure conformance with the following:

(i) All structures and outside activities shall be so located or screened from residential or agricultural districts to avoid disturbance through glare, shading, noise, dirt or other nuisance or hazards.

(ii) No petroleum pumps or aboveground petroleum storage shall be closer than fifteen feet from any street right-of-way.

(iii) Where parking is not permitted within the setback area, the site must be rendered physically impossible for parking between structures and right-of-way via curbing, fence, wall, landscaping or other means acceptable to the Planning Department. (Ord. 12654 (part), 1990)

14.04.080 Multi-Family Residential District (MFR).

(1) Purpose. The purpose of this district is to provide for the increasing need for multi-family uses. Such areas should be located near, or adjacent to, population centers, and should be served by a system of adequate public or private roads, community water and public sewers.

(2) Permitted Uses.

(a) Single-family dwellings

(b) Multi-family dwellings including duplexes: Multi-family apartment buildings

(c) Day care facilities

(3) Accessory Uses. Permitted accessory uses in the MFR district are the same as those accessory uses permitted in the R district, except that accessory buildings for small animals or fowl, other than normal household pets, shall not be permitted.

(4) Special Uses. See Section 14.04.150.

(5) Dimensional Requirements (MFR).

(a) Minimum lot size/minimum lot width: The minimum lot size and width shall be determined by the following table:

Land Use	Lot Area	Lot Width
SINGLE FAMILY DWELLING		
Private Sewer	12,500 square feet*	75 feet
Public Sewer	8,400 square feet	75 feet
DUPLEX:	13,000 square feet	75 feet
MULTI-FAMILY DWELLINGS:		
Public Sewer/ Public Water	13,000 square feet for first two units, plus 3,000 per unit*	100 feet

*Subject to Health Department approval.

(b) Setbacks:

(i) Primary Structures:

Front: 35 feet.

Side: 8 feet on interior lot; 20 feet from street right-of-way.

Rear: 25 feet.

(ii) Accessory Structures:

Front: 35 feet.

Side: 8 feet; 3 feet setback is permitted from the side and rear lot lines when the accessory building is a minimum of 75 feet from the front property line or when there is an alley along the rear property line; 20 feet from the street right-of-way.

Rear: 25 feet; 3 feet setback is permitted from the side and rear lot lines when the accessory building is a minimum of 75 feet from the front property line or when there is an alley along the rear property line.

(c) Maximum lot coverage: 45 percent.

(d) Maximum height: Shall conform to the Building Code of Skagit County. (Ord. 16007 (part), 1995; Ord. 14377 (part), 1992; Ord. 12654 (part), 1990)

14.04.090 Residential District (R).

(1) Purpose. The purpose of this district is to provide for and protect land for development density designed to meet contemporary building and living standards for single-family dwellings and other related uses.

(2) Permitted Uses.

(a) Single-family dwellings.

(b) Mobile homes, as single-family dwellings.

(c) Duplexes (only when approved as part of the approval of a subdivision. See Section 14.04.090 (6)).

(d) Day care facilities.

(3) Accessory Uses.

(a) Accessory buildings and structures, provided they are within the required setbacks and they are at least ten feet from each other and the main building if detached, that they are no more than one story in height, and that they do not occupy more than fifty percent (50%) of the rear yard.

(b) Buildings used for the housing of animals or fowl. Such buildings shall not exceed thirty-six (36) square feet in floor area when located on a lot of less than one-half acre. The building shall not be located closer than twenty-five (25) feet to a property line, except by mutual recorded agreement of adjacent property owners.

(c) Accessory living quarters provided that they do not contain kitchen facilities and are not permanently occupied by resident other than family members.

(4) Special Uses. See Section 14.04.150.

(5) Dimensional Requirements.

(a) Minimum lot size/minimum lot width: The minimum lot size and width shall be determined by the following table:

Land Use	Lot Area	Lot Width
SINGLE FAMILY DWELLING		
Private Sewer	12,500 square feet*	75 feet
Public Sewer	8,400 square feet	75 feet
DUPLEX:	13,000 square feet	75 feet

*Subject to Health Department approval.

(b) Setbacks:

(i) Primary Structures:

Front: 35 feet, 25 feet on minor access and dead-end streets.

Side: 8 feet on interior lot, 20 feet on street right-of-way.

Rear: 25 feet.

(ii) Accessory Structures:

Front: 35 feet.

Side: 8 feet, 3 feet setback is permitted from the side and rear lot lines when the accessory building is a minimum of 75 feet from the front property line or when there is an alley along the rear property line providing that the structure is 1,000 square feet or less in size and 16 feet or less in height.

A side yard setback of 20 feet is required for all accessory buildings when the side property line is adjacent to a street right-of-way.

Rear Yard: 25 feet, 3 feet setback is permitted from the side and rear lot lines when the accessory building is a minimum of 75 feet from the front property line or when there is an alley along the rear property line providing that the structure is 1,000 square feet or less in size and 16 feet or less in height.

(c) Maximum lot coverage: 35 percent.

(d) Maximum height: Shall conform to the Building Code of Skagit County.

(6) Residential General Provisions.

(a) Duplexes shall not be built on more than 10% of the available lots in any plat or subdivision unless specific approval for a greater number of duplexes is obtained as a part of the plat approval. The approved number of duplex lots shall be inscribed on the face of the plat. The allowable number of duplex lots shall not exceed the following numbers without the specific approval of the Board of County Commissioners.

Less than 8 lots	0 Duplex lots
8-15 lots	1 Duplex lots
16-25 lots	2 Duplex lots
26-35 lots	3 Duplex lots
35 lots and over	As determined by the Planning Director in accordance with the same formula.

(b) Applications for modification to the provisions of this section shall be processed in accordance with the procedures pertaining to official controls and amendments described in Section 14.04.210(5) and Section 14.04.210(6). (Ord. 16007 (part), 1995; Ord. 14925 (part), 1993; Ord. 14377 (part), 1992; Ord. 12654 (part), 1990)

14.04.095 Residential Reserve (RR).

(1) Purpose. The purpose of this district is to provide for and protect land that is suitable for rural development, but sewer and water services may not be currently available. It is intended to provide development standards that are suitable for transition to more intensive development should services become available.

(2) Permitted Uses.

(a) Single-family dwellings

(b) Mobile home as single-family dwellings

(c) Day care facilities

(3) Accessory Uses.

(a) Accessory buildings and structures, provided they are within the required setbacks, and they are at least ten feet from each other and the main building if detached, that they are no more than one story in height and that they do not occupy more than fifty percent (50%) of the rear yard.

(b) Buildings used for the housing of animals or fowl.

(c) Accessory living quarters provided that they do not contain kitchen facilities and are not permanently occupied by residents other than family members.

(4) Special Uses. See Section 14.04.150.

(5) Dimensional Requirements.

(a) Minimum lot size: 1 acre

(b) Minimum lot width: 100 feet

(c) Setbacks:

(i) Primary Structures:

Front: 35 feet, 25 feet on minor access and dead-end streets.

Side: 8 feet on interior lot, 20 feet on street right-of-way.

Rear Yard: 25 feet.

(ii) Accessory Structures:

Front: 35 feet.

Side: 8 feet, 3 feet setback is permitted from the side and rear lot lines when the accessory building is a minimum of 75 feet from the front property line or when there is an alley along the rear property line providing that the structure is 1,000 square feet or less in size and 16 feet or less in height.

A side yard setback of 20 feet is required for all accessory buildings when the side property line is adjacent to a street right-of-way.

Rear Yard: 25 feet, 3 feet setback is permitted from the side and rear lot lines when the accessory building is a minimum of 75 feet from the front property line or when there is an alley along the rear property line providing that the structure is 1,000 square feet or less in size and 16 feet or less in height.

(NOTE: The "height of a building" shall be defined as follows: Height of a building is the vertical distance above a reference datum measured to the highest point of the coping of a flat roof or to the deck line of a mansard roof or to the average height of the highest gable of a pitched or hipped roof. The reference datum shall be selected by either of the following, whichever yields a greater height of building:

1. The elevation of the highest adjoining sidewalk or ground surface within a 5-foot horizontal distance of the exterior wall of the building when such a sidewalk or ground surface is not more than 10 feet above lowest grade.

2. An elevation 10 feet higher than the lowest grade when the sidewalk or ground surface described in item 1 above is more than 10 feet above the lowest grade.)

(d) Maximum lot coverage: 35 percent (35%).

(e) Maximum height: Shall conform to the Building Code of Skagit County. (Ord. 16007 (part), 1995; Ord. 14377 (part), 1992; Ord. 12654 (part), 1990)

14.04.100 Rural District (RU).

(1) Purpose. The purpose of this district is to provide for low density development and to preserve the open space character of the land in those areas that are not considered as major resource areas (agriculture, timber), but are so situated that they provide limited agricultural/timber resource value.

(2) Permitted Uses.

(a) Single-family residential dwellings

(b) Agricultural crops, pasture and grazing, tree farms

(c) Cultivation, management and harvest of any forest crop

(d) On-site hazardous waste treatment and storage facilities as an accessory use to a permitted use or Special Use (Section 14.04.150) provided such facilities comply with the State Hazardous Waste Siting Standards and County and State Environmental Policy Act requirements.

(e) Day care facilities

(3) Accessory Uses. Permitted accessory uses in the Rural district include those uses permitted in the Residential district and accessory agricultural structures when used in conjunction with an agricultural use on the premises.

(4) Special Uses. See Section 14.04.150.

(5) Dimensional Requirements.

(a) Minimum lot size: 5 acres

(b) Minimum lot width: 200 feet

(c) Setbacks:

(i) Primary Structures:

Front: 35 feet.

Side: 8 feet on interior lot; 20 feet on street right-of-way.

Rear: 25 feet.

(ii) Accessory Structures:

Front: 35 feet.

Side: 8 feet, 3 feet setback is permitted from the side and rear lot lines when the accessory building is a minimum of 75 feet from the front property line or when there is an alley along the rear property line, 20 feet from street right-of-way.

Rear: 25 feet, 3 feet setback is permitted from the side and rear lot lines when the accessory building is a minimum of 75 feet from the property line or when there is an alley along the rear property line.

(d) Maximum lot coverage: 35 percent (35%)

(e) Maximum height: Shall conform to the Building Code for Skagit County. (Ord. 14377 (part), 1992; Ord. 12654 (part), 1990)

14.04.105 Rural Intermediate (RI).

(1) Purpose. The purpose of this district is to provide for medium density development and to preserve the open space character of the land in those areas that are not considered as significant resource areas. It is intended to provide development standards that are suitable for transition to more intensive development should services become available.

(2) Permitted Uses.

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

typically associated with alluvial and glacial deposits. Quarry rock and valuable minerals such as olivine-rich dunite and limestone have also been designated.

The challenges facing the mineral resource industry primarily relate to conflicting use concerns with neighboring residential uses. With increasing demands for construction materials in developing urban areas, especially in the Puget Sound region, it becomes increasingly important to identify and preserve access to the mineral resources of Skagit County. However, access to much of the county's minable resources has already been precluded by residential development. Skagit County's approach to designating mineral lands is to protect what is remaining, now and for the future. Doing so requires that mineral lands of long-term commercial significance be designated in areas where the impacts from mining, when it occurs, can be reduced to the greatest extent possible.

During the recent update of the Mineral Resource Overlay, Skagit County conducted an in-depth review of geologic formations and potential mineral resource deposits. This mapping update confirmed many known mineral resources and identified new mineral resources. A very few currently conforming mining operations did not meet the criteria for mineral resource land overlay designation as applied during this mapping review. Due to the economic conditions of these operations and their beneficial access to markets, Skagit County will consider these existing operations as conforming uses within the provisions of the Mineral Resource Overlay.

What recent update? When? When & how did public participation occur?

This 'Overlay' is a zone. See attached zoning text.

It is important to ensure that mining policies and regulations, in addition to protecting the resource and its related activities, also protect public health, safety and the environment. These policies and their implementing regulations work in concert with other federal and State laws to ensure that mining operators and surrounding land owners remain good neighbors.

The Natural Resource Lands Element also establishes Right-to-Manage Natural Resource Lands goals and policies to promote a clear mandate for mineral extraction activities as a priority on lands designated as Mineral Resource Overlay. The vitality of the mineral industry is also promoted in the Natural Resource Lands Element by integrating support and information services in a Natural Resource Lands

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Lands	NRL)	
Secondary Forest—Natural Resource Lands	Secondary Forest—Natural Resource Lands (SF-NRL)	1/20 acres or 1/32nd of a section*
Rural Resource—Natural Resource Lands	Rural Resource—Natural Resource Lands (RRc-NRL)	1/40 acres or 1/16th of a section or 4/40 acres with CaRD*
Mineral Resource Overlay	Mineral Reserve Overlay (MRO)	Not Applicable
Urban Growth Area	Urban Reserve Public—Open Space (URP-OS)	Not Applicable
Public Open Space of Regional/Statewide Importance	Public Open Space of Regional/Statewide Importance (OSRSI)	Not Applicable

14.16.030

*See SCC 14.16.850(8), general provisions, for exceptions to the minimum lot size related to siting public safety facilities.

(1) Zoning Maps. The official zoning maps delineate the land use districts. The official zoning maps together with the exploratory matter thereon are hereby adopted by reference and declared a part of this Chapter. The districts may be redefined from time to time by adoption of amendments (rezones) to the zoning map, in accordance with this text and Chapters 36.70 and 36.70A RCW and Chapter 14.08 SCC (Legislative Actions) by a map or maps showing the geographical area and location of said amendments. The Board of County Commissioners shall enter changes on the official zoning map promptly after approval. The map, or maps, shall be filed by the County and be permanently displayed at a location available to the public. Regardless of the existence of copies of the official zoning map, which may from time to time be made or published, the official zoning map shall be located in the office of the Department, and shall be the final authority as to the current boundaries of the land use districts. The official zoning map shall show the zoning of specific parcels of land and the use regulations of the district shall apply to the land and shall be consistent with the Comprehensive Plan land use designations.

(2) Boundary Interpretations. When uncertainty exists as to boundaries of any land use zone shown on the official zone map, the following rules of construction shall apply:

(a) When 2 different zones are separated by a road, the actual centerline of the right-of-way shall be construed to be the zone boundary.

(b) Where zone boundaries are indicated on such maps as approximately following the lot or tract lines, the actual lot tract line shall be construed to be the boundaries of such zone.

(c) Where a zoning district boundary on the official zoning map divides a parcel, the location of such district boundary thereon shall be determined by use of the scale appearing on the zoning map.

(d) Zone boundaries indicated as following shorelines shall be construed to follow such shorelines, and in case of change in the shoreline, shall be construed as moving with the actual shoreline, except in cases where a government meander line exists, in which case the shoreline shall be measured from the meander line.

(e) Boundaries indicated as following railroad lines shall be construed to be the centerline of the right-of-way.

(f) Where a public street or alley is officially vacated or abandoned, the regulations applicable to the abutting property to which the vacated portion reverts shall apply to such vacated or abandoned street or alley.

(g) In case uncertainty exists which cannot be resolved by the application of the foregoing rules, the Administrative Official shall determine the location of such zone boundaries by written decision. (Ord. O20080009 (part); Ord. O20070009 (part); Ord. O20060007 Exh. D § 1A; Ord. O20030009: Ord. 17938 Attch. F (part), 2000)

14.16.100 Rural Village Commercial (RVC).

(1) Purpose. The Rural Village Commercial zoning districts are located within each Rural Village identified in the Comprehensive Plan. This zoning district provides an activity center where rural residents and others can gather, work, shop, entertain and reside. This district is intended to provide for a range of commercial uses and services to meet the everyday needs of rural residents and natural resource industries, to provide employment opportunities for residents of the rural area, and to provide goods, services, and lodging for travelers and tourists to the area. Requirements specific to individual community plans may be incorporated in this Section.

(f) Minimum lot width: 400 feet.

(g) Maximum lot coverage: Except for greenhouses, 10,000 square feet or 10% of the lot area, whichever is greater. Greenhouses may have up to 35% lot coverage.

(6) Additional requirements related to this zone are found in SCC 14.16.600 through 14.16.900 and the rest of the Skagit County Code. (Ord. O20090010 Attch. 1 (part); Ord. O20080012 (part); Ord. O20080004 (part); Ord. O20070009 (part); Ord. O20050003 (part); Ord. R20020130 (part): Ord. 18375 § 4 (part), 2001: Ord. 17938 Attch. F (part), 2000)

14.16 = Zoning Code

14.16.440 Mineral Resource Overlay (MRO).

(1) Purpose. The purpose of the Mineral Resource Overlay (MRO) is to maintain and enhance natural resource-based industries by conserving mineral resource lands, allowing continued operation of existing legally established uses, and by assuring that use of adjacent lands does not interfere with the extraction and quarrying of minerals. A MRO overlays Natural Resource Lands (NRL) zoning districts and imposes regulations in addition to those normally required in the underlying NRL zoning district. Mineral extraction and processing activities are allowed as a Hearing Examiner special use, and must comply with the Surface Mining Act, Chapter 78.44 RCW. The MRO recognizes those areas that are designated to protect long-term, commercially viable mineral Natural Resource Lands and recognizes that mineral resources must be in close and economic proximity to the market to be served.

(2) Designation Procedure. The MRO represents those areas that are designated as Mineral Resource Overlay (MRO) on the Skagit County Comprehensive Plan Map adopted by Ordinance 16550, or as thereafter amended. Unless otherwise restricted by ordinance, new Mineral Resource Overlay areas may be designated by complying with Chapter 36.70A RCW, the Comprehensive Plan amendment procedures of the Skagit County Comprehensive Plan, and Chapter 14.08 SCC.

(3) Pre-Existing Designated and Undesignated Mining Operations.

(a) Except as allowed in Subsection (3)(b) of this Section, or as allowed as an accessory use, pursuant to SCC 14.16.410(3)(d), 14.16.420(2)(f), 14.16.430(2)(h) and 14.16.430(4)(f), no new mining special use permits shall be issued outside of the designated Mineral Resource Overlay.

(b) Commercial mining operations lying outside of a designated MRO that are permitted and legally existing at the time of adoption of the ordinance codified in this Section may continue to operate on the permitted mining site. Expansion of the existing operations beyond the geographical and/or operational limits imposed by the existing approval is allowed, provided the owner applies for and receives a new mining special-use permit issued under this Section that covers the expanded operation area. Any expansion shall not extend beyond the legal parcel on which the legally existing, permitted use is located.

(c) Commercial mining operations lying within a designated MRO that are permitted and legally existing at the time of adoption of the ordinance codified in this Section may continue to operate on the permitted mine site. Expansion of the existing operations beyond the geographical and/or operational limits imposed by the existing approval is allowed, provided the owner applies for and receives a new mining special-use permit issued under this Section that covers the expanded operation and/or area.

(4) Removal of Designation Status. A petitioner may seek removal of designated Mineral Resource Lands and the associated Mineral Resource Overlay on the Official Zoning Map through the Comprehensive Plan amendment process, pursuant to Chapter 14.08 SCC, and by demonstrating 1 or more of the following:

(a) The mineral resource is depleted to a point that it is no longer economically feasible to continue mining on the site.

(b) New or updated geological data no longer indicates the potential for mineral resources of regional or long-term commercial significance on the site.

(c) The Mineral Resource Overlay was designated based on a technical mapping error.

(5) Permitted Uses. All uses permitted in the underlying zone are allowed in the MRO.

(6) Accessory Uses. All accessory uses permitted in the underlying zone are allowed in the MRO.

(7) Special Uses.

(a) Any other special use permitted in the underlying zoning district is likewise permitted in the MRO.

(b) The following uses are permitted as a Hearing Examiner Special Use in the Mineral Resource Overlay subject to the requirements of this Section and the restrictions contained in the underlying zone. Uses under this Section must comply with Chapter 78.44 RCW, Surface Mining Act, Chapter 90.48 RCW, the Water Pollution Control Act, and all other applicable laws and regulations:

(i) Activities associated with mining or quarrying operations, including blasting and use of equipment in connection with an extraction operation, maintenance of mineral extraction equipment, maintenance of roads, traffic control, sorting, crushing, cleaning and loading;

(ii) On-site processing including asphalt or concrete batching and asphalt or concrete recycling; and

(iii) Surface or underground mining or quarrying of mineral deposits or building materials from rock, stone, gravel, sand, and earth together with associated structures and equipment;

(iv) Temporary dwellings for a caretaker or superintendent and their family.

(8) Application For Mining Special Use Permit. An applicant for a mining operations special use permit shall submit:

(a) The following information on maps in an 11-inch by 17-inch format size:

(i) A vicinity map with a north arrow indicating the area on which the extraction operation is proposed including a legal description, showing right-of-way width of access roads to the proposed site from the nearest community and any roads proposed on the site, and showing zoning of adjacent properties and land uses within 5 miles of the area proposed for mineral extraction and related activities;

(ii) A pre-mining map drawn to scale with an appropriate scale bar showing the permit area and buffers, elevations and contours, natural slopes and other drainage patterns, boundaries of municipalities, boundaries of property ownership, names and addresses of adjacent property owners, locations of nearby mines, locations of all railroads, bridges, utility lines or other rights of way, locations and names of any streams and natural or artificial drain ways on or adjacent to the site, locations of parks and other significant features;

(iii) A reclamation sequence map drawn to scale with an appropriate scale bar covering the same area as the pre-mining map showing the permit area border and buffers, excavation areas, location of all proposed access roads to be built, location of types of setbacks and beams, numbered segments and the direction of the sequence of mining, soil storage areas and sequence of stripping, storing and replacement of mined segments, overburden storage areas and sequence of stripping, storing and replacement of overburden on mined segments, waste rock piles and how they will be reclaimed and stabilized, operation plant and processing areas, measures to be taken to adjacent surface area to prevent slumping or landslides on adjacent lands, location and description of stormwater and erosion control systems, including drainage facilities and settling ponds and estimated runoff served by individual facilities; and

(iv) A final reclamation map drawn to scale with an appropriate scale bar covering the same area as the pre-mining map permit area and buffers, final elevations and contours, adjacent natural ground slopes, reclaimed drainage patterns, general topography, locations and names of any roads, utility lines, rights-of-way, streams, bridges, lakes, springs, wetlands, location and depth of topsoil to be replaced after seedbed preparation, permanent drainage and water control systems, area to be re-vegetated and proposed species, 2 cross-sections (at right angles) with horizontal and vertical scales the same that show the original and final topography and the water table.

(b) A report by a qualified geologist, hydrologist or licensed engineer characterizing the area's ground water including, but not limited to, the following information:

(i) A description of the geology and hydro-geology of the area including the delineation of aquifer, aquitards, or aquicludes (confining layers), hydrogeologic cross-sections, porosity and horizontal and vertical permeability estimates;

(ii) Determination of the direction and velocity of ground water movement, water table contour and potentiometric surface maps (for confined aquifers), if applicable; and

(iii) A map containing the limits of the mine, buffer zones, location of all ground water wells within 1 mile distance down gradient from the property boundaries, location of all perennial streams and springs, and definition or specification of locations of aquifer recharge and discharge areas.

(c) The estimated quantities of all materials to be extracted.

(d) Identification of any possible Scientific Resource Sites that may be located on the proposed site. Scientific Resource Sites include unique or rare occurrences of rocks, minerals, or fossils that are of outstanding scientific significance. These areas must be delineated on the map in Subsection (8)(a)(ii) above and the proposal for preservation of the identified area(s) must be addressed.

(e) An on-site study to determine appropriate mitigation requirements for noise, vibration and dust levels. The study should specify what levels the applicant deems satisfactory to mitigate off-site disturbances.

(f) An operations proposal detailing estimated frequency of blasting, estimated truckloads per day, what provisions for screening and fencing are proposed, and estimated hours of operation.

(g) Identification and description of those critical areas designated and regulated by Chapter 14.24 SCC, together with any critical areas studies that may be required by Chapter 14.24 SCC.

(h) A completed environmental checklist.

(i) A review from Skagit County Public Works Department or Washington State Department of Transportation demonstrating that roads or bridges are capable of sustaining the necessary traffic for the proposed mineral extraction operation, and that the proposed operation meets level-of-service, safety, and other standards as outlined in the Skagit County Transportation Systems Plan, the Skagit County Comprehensive Plan, and applicable State and local regulations.

(9) Hearing Examiner Review. Except as may be provided herein to the contrary, all applications for mining operations special use permit shall be reviewed by the Hearing Examiner under the procedures set forth in Chapter 14.06 SCC. The Hearing Examiner shall make a decision as to whether or not it should be approved based upon the special use approval criteria and the following provisions:

(a) When reviewing an application for mining operations special use permit, the Hearing Examiner should recognize that surface mining is an essential economic activity and that it is not possible to extract minerals without producing some environmental impacts. The Hearing Examiner shall consider all relevant evidence and conditions that will mitigate detrimental impacts to the environment and conditions that protect the general welfare, health and safety. The permit shall be granted if the impacts are mitigatable. The burden of proof shall be on the applicant. Mitigating conditions shall be performance-based, objective standards that:

(i) Are directly and proportionately related to limiting surface mining impacts;

(ii) Are reasonable, practicable and generally capable of being achieved by the mine operator; and

(iii) Take into consideration existing and available technologies applicable to mining operations.

(b) The Hearing Examiner shall consider the requirements of this Chapter as minimum standards based on unique site-specific factors or conditions as appropriate to protect public health, safety, and the environment.

(c) Appropriate site-specific conditions shall be required to mitigate existing and potential incompatibilities between the mineral extraction operation and adjacent parcels. Such limitations shall reflect the differences in potential impacts based on the mineral extraction operation's location in resource, rural or urban growth areas and recognize that the purpose of designating mineral resource lands is to conserve mineral resource lands, allow continued operation of existing legally established mining operations, and assure that use of adjacent lands does not interfere with the extraction of minerals. The Hearing Examiner shall take into consideration the January 1996 publication *Best Management Practices for Reclaiming Surface Mines in Washington and Oregon*, published jointly by the Oregon Department of Geology and Mineral Industries and the Washington State Department of Natural Resources, Ch. 3, Operation and Reclamation Strategies, in determining appropriate mitigation requirements for operational impacts.

(d) Appropriate site-specific conditions shall be required to mitigate stormwater runoff and erosion impact. The Hearing Examiner shall take into consideration the January 1996 publication *Best Management Practices for Reclaiming Surface Mines in Washington and Oregon*, published jointly by the Oregon Department of Geology and Mineral Industries and the Washington State Department of Natural Resources, Ch. 2, Storm Water and Erosion Control, and the National Pollutant Discharge Elimination System (NPDES) Surface Water Protection requirements in determining appropriate conditions for mitigating stormwater and erosion impacts.

(e) The Hearing Examiner shall consider public interests such as fishing, boating, hiking and camping when reviewing a mining operations special use permit, and may impose mitigating measures as necessary and appropriate.

(10) Operating Standards or Requirements.

(a) Site Area and Width. When the activity includes both extraction and on-site mineral crushing or mineral processing including asphalt or concrete batching and asphalt or concrete recycling, the site area shall be a minimum, of 20 acres. There shall be a minimum lot width of 500 feet for crushing or processing activities. Operations that are limited to extraction and transportation shall comply with dimensional standards of the underlying zone.

(b) Buffers.

(i) A minimum 200-foot buffer shall be required between on-site crushing, processing, or recycling activities and adjacent properties for the site as a condition for the issuance of a mining operations special use permit.

(ii) Adjacent properties are required to maintain a 200-foot buffer from the mineral resource designated land or sign a nuisance waiver to reduce the 200-foot buffer. In the case of a pre-existing structure located in the buffer of adjacent property, the required buffer shall be established on the mineral resource designated land.

(iii) A minimum 100-foot buffer shall be required for the site where operations are limited to the extraction and transportation of minerals. Once the extraction and transportation operations have been completed, the material in the buffer may be utilized during reclamation.

(c) Maximum Permissible Noise Levels. Maximum permissible noise levels shall be according to the provisions of the Chapter 173-60 WAC, Maximum Environmental Noise Levels.

(d) Blasting. Blasting shall be restricted to daylight hours when the mineral extraction operation is within 1/4 mile of a residential area with a greater density than 1 dwelling unit per 10 acres. The Hearing Examiner may otherwise set blasting hours and conditions based on site-specific circumstances. Except in the case of emergencies declared by civil authorities, blasts should be scheduled for regular and predictable times.

(e) Vertical Limitations/Aquifer Protection.

(i) Surface mining shall be vertically limited to only 1 aquifer unless approved by the Washington State Department of Ecology. Hydrological barriers separating aquifers shall not otherwise be disturbed.

(ii) Activities related to mineral extraction and processing operations in the vicinity of aquifers must provide safeguards including containment to prevent direct contamination to the open aquifers and indirect contamination through infiltration of mining operation pollutants.

(iii) Imported material shall not be used as a backfill for mine sites where an aquifer has been breached.

(iv) Disturbed aquifers should be reclaimed as ponds or lakes and/or wetlands.

(v) Additional buffers and setbacks may be required beyond those listed in Subsection (10)(a-b) above, if necessary, to prevent over-excavation when mining in an aquifer.

(vi) All relevant provisions of the Critical Areas Ordinance, Chapter 14.24 SCC, for aquifer protection shall be met.

(f) Surface Water Protection. All mineral and aggregate sites shall meet the minimum requirements of Chapter 14.32 SCC, as well as all pertinent requirements of the Washington State Department of Ecology, the Department of Natural Resources, Department of Fish & Wildlife and other State and Federal regulations regarding surface water protection.

(i) Storage pond systems for holding processing waters shall be designed to preclude untreated discharge to natural streams or surface waters, unless the discharges are otherwise regulated and allowed by a State or Federal government agency.

(ii) The flow of natural runoff from extraction sites shall be dispersed or regulated such that soil erosion on receiving lands is prevented.

(g) Bench/Terrace. Benches shall be back-sloped and shall be established at not more than 40-foot intervals to control surface drainage and debris. Swales or ditches on benches shall have a maximum gradient of 5%.

(h) Reclamation. Reclamation of surface mining sites shall be in accordance with the requirements of the State Department of Natural Resources. Reclamation activities shall not allow land filling unless sites comply with Chapters 173-304 and 173-351 WAC, Chapter 12.16 SCC, other relevant State, and Federal regulations. If the operation is not subject to the State Department of Natural Resources permitting requirements, the following minimum standards shall apply. All reclaimed slopes shall:

(i) Have a varied steepness;

(ii) Have a natural appearance in both profile and plan view;

(iii) Have no large rectilinear topographic elements;

(iv) Not exceed 2 horizontal to 1 vertical except as necessary to blend with natural adjacent slopes;

(v) Be compacted if significant back-filling is required to produce the final reclaimed slope;

(vi) Provide measures to establish a beneficial wetland where a lake pond or swamp is created; and

(vii) Place topsoil and re-vegetate as necessary to stabilize slopes and controls erosion.

(i) Hours of Operation. Hours of operation shall vary according to the location of the site as stated below and may be shortened by the Hearing Examiner based on site-specific circumstances:

(i) Within designated natural resource lands, the hours of operation may be unlimited. The Hearing Examiner may limit hours of operation to daylight hours or to such other reasonable limitation deemed necessary to address potential significant adverse impacts to existing adjacent land uses, on any portion of the mining site where mining activity is proposed to occur less than 1/4 mile from existing Rural Intermediate, Rural Village, or Urban Growth Area designated lands;

(ii) Within rural lands, the hours of operation shall be from dawn to dusk;

(iii) Within urban growth areas and rural villages, the hours of operation shall be from 8 a.m. to 5 p.m., Monday through Saturday; and

(iv) During emergencies, restrictions on hours of operation can be suspended by the Board of County Commissioners pursuant to the lawful procedures for declaring an emergency.

(j) Chemical Leach Mining. Chemical leach mining shall not be allowed.

(k) Responsibility. The landowner(s) and operator(s) shall be held jointly responsible for the operation of a mineral extraction site.

(l) Metals mining shall be regulated by Chapter 78.56 RCW, Metals Mining and Milling Act.

(11) Additional requirements related to this zone are found in SCC 14.16.600 through 14.16.900 and the rest of the Skagit County Code. (Ord. O20090010 Attch. 1 (part); Ord. O20070009 (part); Ord. 17938 Attch. F (part), 2000)

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

policy 8A-1.5 **Skagit River** - The County supports improving the flow of traffic over the Skagit River, including new bridge construction.

policy 8A-1.6 **Arterial access** - Primary arterial access points should be designed to ensure maximum safety while minimizing traffic flow disruptions.

policy 8A-1.7 **Natural Resource Industries** – consider the transportation needs of the agriculture and forest products industries when making decisions about the management and maintenance of the roadway system.

policy 8A-1.8 To ensure integration of transportation and land use planning, make decisions regarding the location and improvement of transportation facilities and public transit in a manner consistent with the Comprehensive Plan's goals, policies, and land use map.

Good

Commented [A83]: New policy suggested by the Planning Commission.

Goal 8A-2 Level of Service

Establish level of service standards for the County's road system to gauge the performance of the system and determine areas where transportation improvements are required.

policy 8A-2.1 **Level of Service Standards** - The Level of Service (LOS) standard for County roads is C. LOS D is acceptable for all road segments that:

(a) Have Annualized Average Daily Traffic (AADT) greater than 7,000 vehicles; and

(b) Are NOT federally functionally classified as ~~an or~~ a Local Access Road; and

(c) Are designated as a County Freight and Goods Transportation Systems Route (FGTS).

The LOS standard for County road intersections is LOS D.

What LOS and other standards apply for County roads that end in a state arterial? What safety principles for a State arterial that is a pre-existing collector road as SR20 in on Fidalgo Island between Sharpes Corners Deception Pass Park?

RECEIVED APR 14 2015 Skagit County

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

Goal 8A-8 Tourism and Recreation

Support the promotion of tourism, recreation, and special events through the County transportation system.

policy 8A-8.1 Involve affected jurisdictions in the planning and design of transportation projects that affect major tourism, park, and recreation facilities.

policy 8A-8.2 Coordinate management of the transportation system during special events with the responsible program organizations, while minimizing the disruption of normal economic operations including agriculture, forestry, and other natural resource industries.

policy 8A-8.3 Encourage the state to consider high-season traffic demand on SR 20 in East Skagit County whenever the state studies the need for improvements.

Goal 8A-9 Scenic Highways

Support the preservation and enhancement of scenic highways and historic, archeological and cultural resources within Skagit County.

policy 8A-9.1 **Scenic Roads Program** – Encourage the state and federal Scenic Highways and Scenic Byways programs to ensure the preservation of scenic resources along designated highways.

policy 8A-9.2 **Interpretive sites** - Develop cultural, historic and natural interpretive sites situated on public lands in a way that non-motorized travelers can enjoy them.

policy 8A-9.3 **Coordination** - Work with the state ~~in~~ to implement~~ing~~ and maintain highway heritage programs in Skagit County, which integrate scenic

Scenic + heritage roads are not on SC Planning radar when SR 20 east of Bacon Creek is zoned to be undermined. There is no map of these, nor does the SMP recognize them in the need for view sites of shorelines

Commented [A91]: Policy addition suggested by Planning Commission.

good

Commented [A92]: Modified language because program has already been implemented.

good

RECEIVED
APR 14 2011

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

RECEIVED
APR 1 1 ...5
SKAGIT COUNTY
PDS

and when such services are financially supportable at rural densities and do not permit urban development. Because of the 2001 Rule regarding instream flows, Skagit County would support extension of piped water to certain areas to support rural-level development where access to groundwater via exempt wells is unavailable.

Good example of protecting land that might be full market tax value if buildable

Commented [A116]: Proposed language included because Skagit County will support efforts to extend public water where feasible to areas affected by instream flow rule.

Comprehensive Plan Policies Regarding Water

This Comprehensive Plan recognizes that the need for the provision of piped water in rural areas may occur under limited circumstances such as: the transmission pipeline routing between Urban Growth Areas; where existing developments are providing rural public water service and fire protection in accordance with the CWSP; where groundwater does not meet Safe Drinking Water Act and State Health Department criteria for potable water use; where water quantity issues related to actual yield or where groundwater withdrawal will cause a conflict with ~~instream resources as defined by the Skagit River MOA~~the 2001 Rule related to instream flows; and properties that are rural in nature and density and are adjacent to a piped water system.

Commented [A117]: Updating to reflect the adoption of the 2001 instream flow rule and to delete reference to 1996 MOA.

The provision of piped water service in rural areas ~~shall~~ should support the combined objectives of the ~~Growth Management Act~~GMA, the CWSP, individual Water System Plans, and the ~~Skagit River MOA~~ and appropriate State and county rules and procedures as defined ~~by state~~ law. ~~The implementation of the Skagit River MOA and the update of the CWSP as well as resolution of State rules and case law will better define the requirements to, and application of, the level of service criteria where there is a transition between urban and rural service zones, existing development in rural areas, and agricultural demands for piped water (i.e., dairies and container farming).~~

For those resident on salt-water islands - Sinclair, Guemes and South Fidalgo where there are no public waterlines, where is the policy protecting the Sole Source aquifers - the areas where rain, dew & fog are the only source of water?
cf. 14.24.320 and annual precipitation map attached.

policy 9A-8.1 Cooperation with water districts and other water providers shall be extended to support them in their responsibility to provide a reliable service to assure an adequate quality and quantity of potable water and high quality water supply within their service areas.

policy 9A-8.2 Water supply infrastructure expansion shall be designed to meet local needs and urban or rural levels of service standards,-and comply with this Comprehensive Plan's land use densities.

14.24.320 Aquifer recharge areas prohibited activities.

The following activities are prohibited in Category I areas due to the probability or potential magnitude of their adverse effects on groundwater:

(1) Landfills, including, but not limited to, hazardous or dangerous waste disposal facilities as defined in Chapter 173-303 WAC, municipal solid waste landfills as defined in Chapter 173-351 WAC, and limited purpose landfills as defined in Chapter 173-350 WAC.

(2) Underground injection wells. Class I, III, and IV wells and subclasses 5F01, 5D03, 5F04, 5W09, 5W10, 5W11, 5W31, 5X13, 5X14, 5X15, 5W20, 5X28, and 5N24 of Class V wells, such as:

(a) Agricultural drainage wells;

(b) Untreated sewage waste disposal wells;

(c) Cesspools;

(d) Industrial process water and disposal wells; and

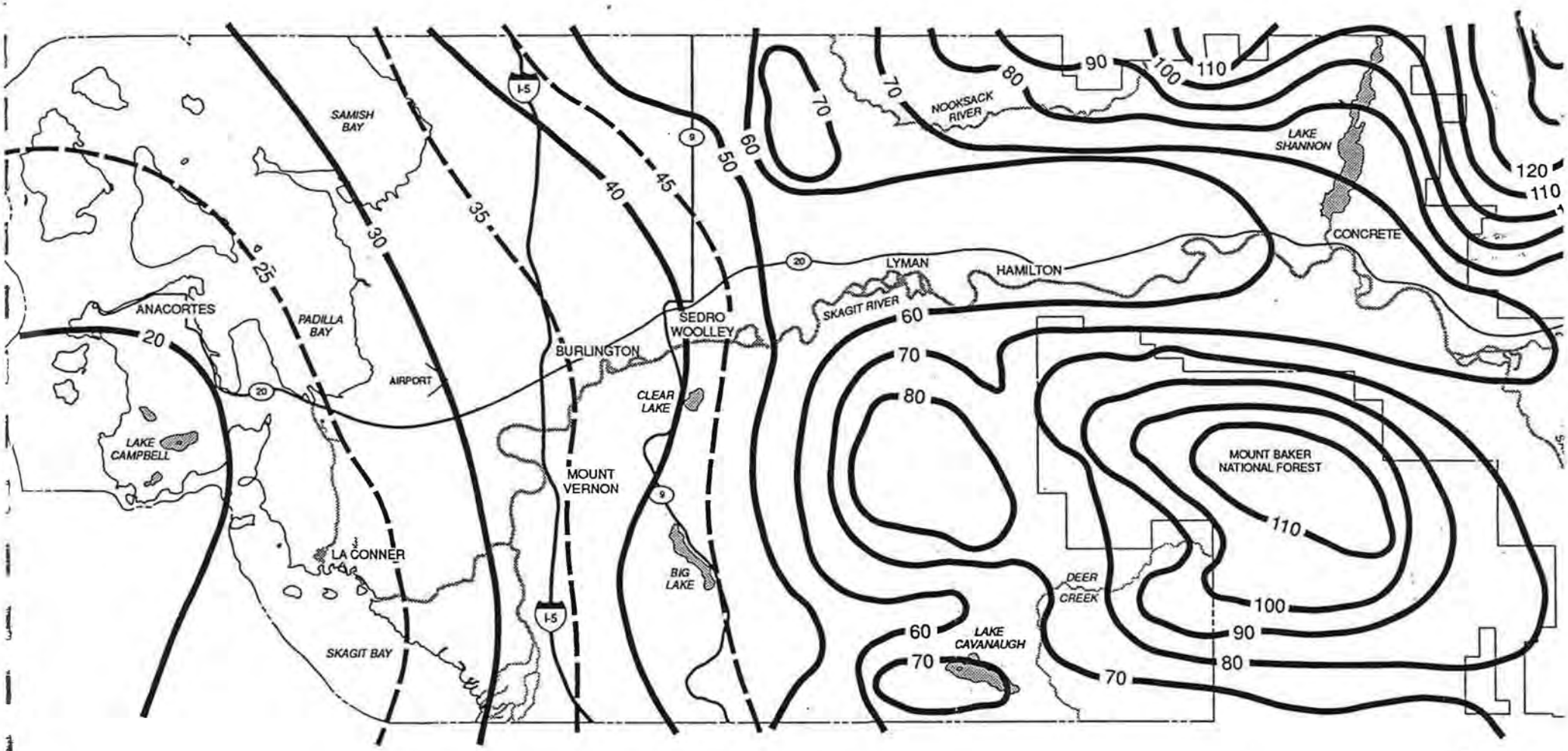
(e) Radioactive waste disposal.

(3) Wood treatment facilities that allow any portion of the treatment process to occur over permeable surfaces (both natural and manmade).

(4) Facilities that store, process, or dispose of chemicals containing perchloroethylene (PCE) or methyl tertiary butyl ether (MTBE).

(5) Facilities that store, process, or dispose of radioactive substances.

(6) Other activities that the Administrative Official or Health Officer determines would significantly degrade groundwater quality or reduce the recharge to aquifers currently or potentially used as a potable water source or that may serve as a significant source of base flow to a flow-sensitive basin stream. The determination must be made based on credible scientific information. (Ord. O20080014 (part))



Source: Pacific Northwest River Basins Commission Comprehensive Framework Study of Water and Related Lands - Water Resources Appendix V Volume 2 1970

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SCALE IN MILES

0 2 4

Mean Annual Precipitation

Figure 3.3-2 Mean Annual Precipitation

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

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It provides regional coordination and consistency with other jurisdictional planning efforts. The intent is that other public agencies (local, regional, state, federal, and tribal), in cooperation with Skagit County, use the Comprehensive Plan in conjunction with the Countywide Planning Policies as a regional perspective or guidepost when developing other plans and growth policies, and when making project decisions.

It allows for citizen participation and involvement. Comprehensive planning is an evolving process which allows for periodic review and updates in response to changing community goals and vision as articulated by citizens, businesses, and interested organizations.

It protects citizen property rights while achieving countywide goals and policies. Implementation of the comprehensive plan is carried out through a process that assures regulatory or administrative actions do not result in unconstitutional taking of private property. The land use plan and implementing zoning provide reasonable use of private properties. A permit process system implements the Comprehensive Plan to ensure that there is consideration of applications in a timely manner. Comment and appeal procedures are included as appropriate to provide avenues for public and property owner input.

In 2015 the public process for elements rural + Transportation were good. In 2016, when we are given 795 pages to review, including a major set of changes in the Comp Plan, which changes can damage the full market value of private property, the time given is a mockery of public participation.

Commented [A136]: Language added to address RCW 36.70A.370 to ensure proposed regulatory or administrative actions do not result in any unconstitutional taking of private property.

Implementation Themes

The County's role in the overall regional growth management implementation process involves several major activities, all of which are discussed further in various sections of the Plan:

- City/County coordination: *Within an agreed-upon framework, the County works with the cities and towns to address growth and development in the Urban Growth Areas through the coordination of public infrastructure investment and permitting activities, and the forecasting and monitoring of growth to ensure that adequate land is available for future urban needs.*

The Watershed documents (339 detailed pages) had no hearing. Public was told various reasons, + given no clean text on these docs (including designation maps) and their future significance. They are useful but unedited and cannot, i.e. be used to enforce.

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APR 14 2016
SKAGIT COUNTY
PDS

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

~~will help to create a cohesive and more self-sufficient urban community, while insuring~~ The 2014 update to the plan, development regulations and land use designations expanded the area within the UGA available for industrial development; rezoned or removed land previously intended for new urban residential development, and adopted measures to ensure **compatibility with continued development of the Skagit** ~~County airport~~ Regional Airport.

(c) **Fidalgo Island.** ~~The community plan for Fidalgo Island should include the following: provisions for maintaining the existing rural character and lifestyles of the island; an assessment of the natural and built environment such as, but not limited to: shoreline environs, geologically hazardous areas, drainage, marine and upland water quality, suitability of soils and geology for development, fish and wildlife habitat, open space areas/corridors, transportation networks, and availability and cost of public facilities and services. The Fidalgo Island Community Plan should also consider previous land use studies and reports in determining whether additional rural density is appropriate to minimize large-lot sprawl and to create more logical boundaries incorporating the existing Rural Intermediate designations.~~ An initial subarea planning process began in 2003. The County appointed a Citizen Advisory Committee and Technical Advisory Committee, held open houses, conducted a survey, and gathered background information about Fidalgo Island. As part of a draft Subarea Plan, released in January 2006, the Citizen Advisory Committee recommended rezoning much of the island to 2.5 acres (Rural Intermediate). That recommendation generated significant community opposition and concerns about consistency with the Growth Management Act. The 2.5 acre recommendation, and the original draft Subarea Plan as a whole, are not under active consideration by the County although

See 6 attachments.

To change or alter the Fidalgo Plan to nothing violates GMA – there was no public process. On 9/22/15 R. Wesen told the room there would be no future planning unless we did it. That is not the GMA version of a public process.

Because salt water islands are very different from river valleys, in 1975, SC approved "a Comprehensive Plan for the Islands District of Skagit County."

After GMA, these islands had to give up all recognition of their separate geologic condition so the river valleys with forestry, farming & fish protection could write the Plan & Codes. We were promised Subarea Plans. Guemes was desperate to protect ground water in the face of SC contempt. They now have a Plan.

Fidalgo was/is much more divided, depending in part if public water lines are available. A map was made of these during the first, 2005 effort to plan; I have never seen it used.

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

much of the background information gathered about the island remains of value. Drainage was one of many concerns expressed by island residents before and during the public process. In 2010, the County completed the South Fidalgo Island Stormwater Management Plan to evaluate and where possible address the community's drainage concerns.

(d) Guemes Island. The ~~community plan for~~ Guemes Island Subarea Plan, ~~drafted in mid-2007~~adopted in January 2011, contains recommendations to protect the sole-source aquifer, shoreline environs, open space and natural resource lands, and transportation, among other topics. Some of those recommendations are proposed for implementation through code as part of the 2016 periodic update to the comprehensive plan and development regulations.

(e) Town of Hamilton. ~~The community plan is evaluating expansion of the Urban Growth Area for long-term future growth of the Town of Hamilton, including relocation of existing Hamilton residences out of the floodway, purchase and transfer of floodway development rights from identified surrounding areas, restoration of the Skagit River floodway, and development of vacant industrial land.~~ In 2008, Skagit County approved the Town of Hamilton Subarea Plan and an expansion of its Urban Growth, both important steps in the town's efforts to relocate itself out of the Skagit River floodway. The Hamilton UGA expansion provided the town with 48 acres outside of the floodway for the relocation of its old town commercial center and residential areas; added 50 acres owned by Janicki Industries for construction of a high-tech manufacturing facility; and designated 157 acres to the northeast of the new UGA as "Hamilton Urban Reserve," indicating the town's long-term plans to expand into that area.

those of us who took part in the 1990's liked the geographical descriptions & analysis in the Mookachanga & especially the first ½ of the Samish Plans and wanted that analysis for Fidalgo, but SC has avoided geography in favor of zones after 1995.

Zones come after planning analysis of roads, infrastructure, GMA required natural hazard recognition, etc.

The 1990 rains in November forced the creation of a county Drainage Utility. A ½ hour screaming event at a meeting led SC government people to recognize our fear of uncontrolled surface & sub-surface water. SC seems to believe having this document is all planning needs, too. Public Works has used it well, but all John Cooper in permitting can say, while he is concerned and understands, "the Code won't let me protect those downhill." Since taxes are also a government resource, protect the full market value of South Fidalgo Island.

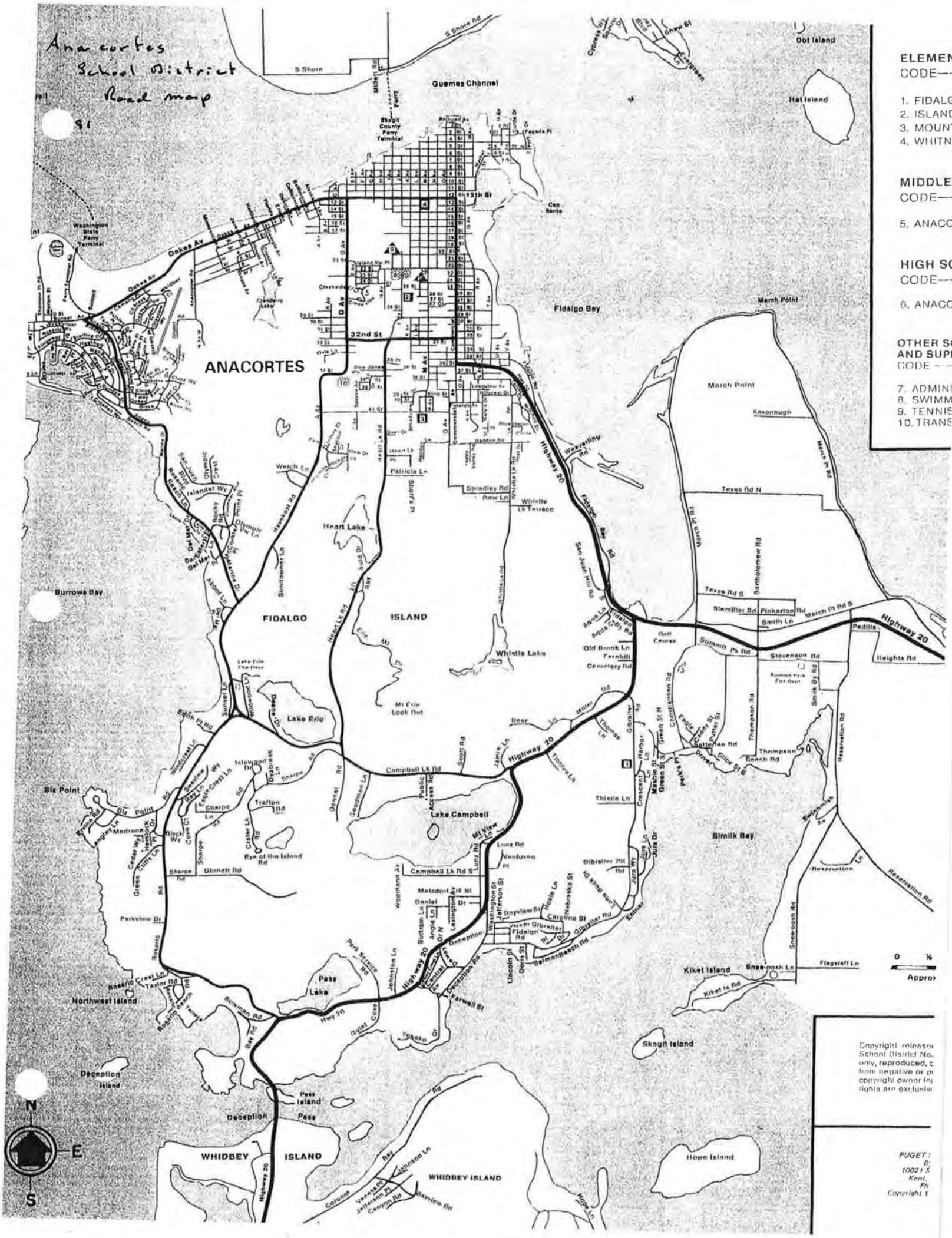
Anacortes
School District
Road map

ELEMEN
CODE—
1. FIDALG
2. ISLAND
3. MOUNT
4. WHITNE

MIDDLE
CODE—
5. ANACO

HIGH SC
CODE—
6. ANACO

OTHER SC
AND SUP
CODE —
7. ADMINI
8. SWIMM
9. TENNIS
10. TRANS



Copyright release
School District No.
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PUGET
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10021 S
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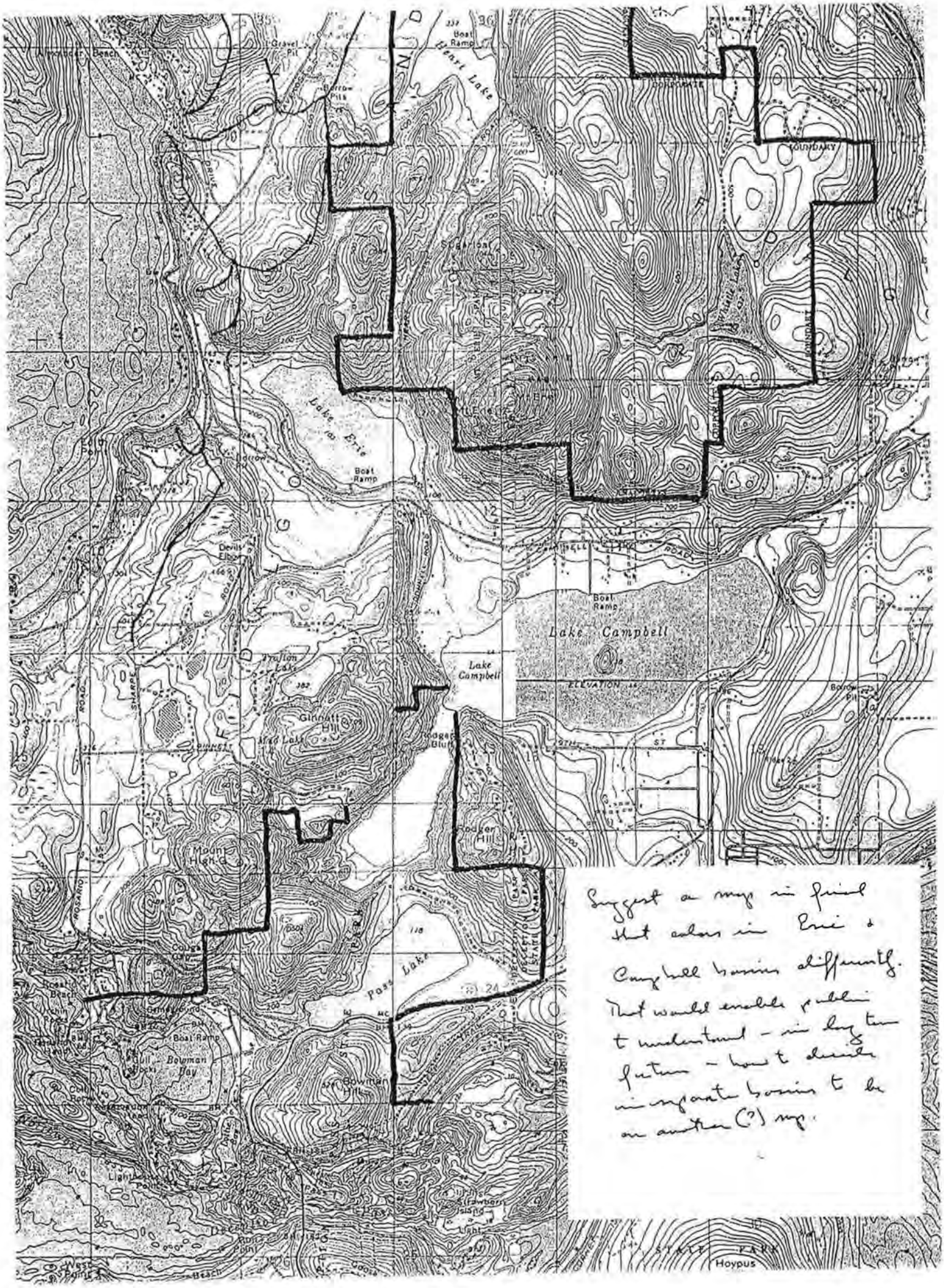
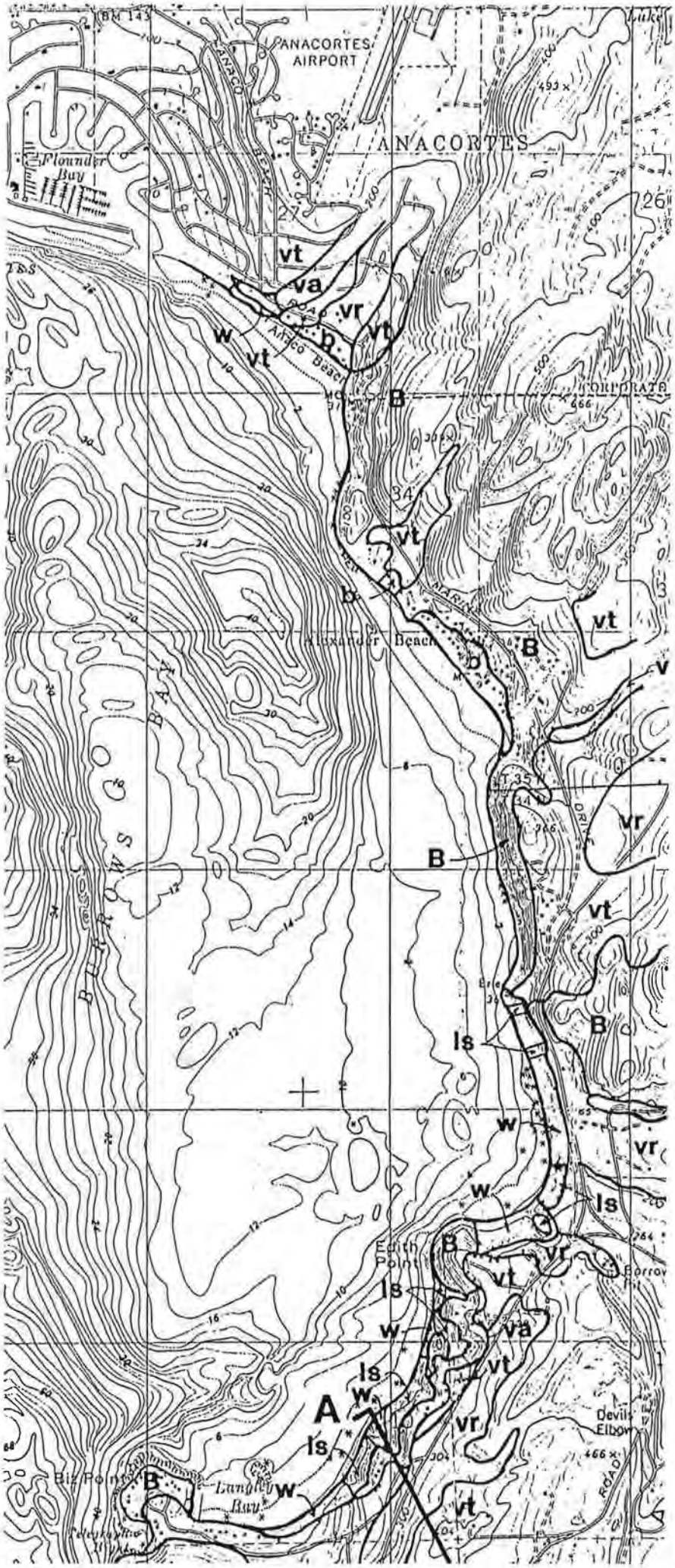
Copyright 1


Lake Erie
Lake Campbell
Boat Ramp
Gravel Pit
Borrow Pits
Heart Lake
Scobrison
Devils Elbow
Trafton Lake
Ginnatt Hill
Mud Lake
Lodge Bluff
Lodge Hill
Mount High
Pass Lake
Bowman Bay
Bowman Hill
Strawberry Island
Hoypus
Lake Campbell
Boat Ramp
Borrow Pit
ELEVATION
Suggest a map in final that colors in Erie & Campbell basins differently. That would enable public to understand - in long term future - how to divide in separate basins to be on another (?) map.



EXPLANATION:

b	BEACH DEPOSITS
ls	LANDSLIDE DEPOSITS
vr	VASHON RECESSIONAL OUTWASH
vt	VASHON TILL
va	VASHON ADVANCE OUTWASH
w	WHIDBEY FORMATION
B	BEDROCK

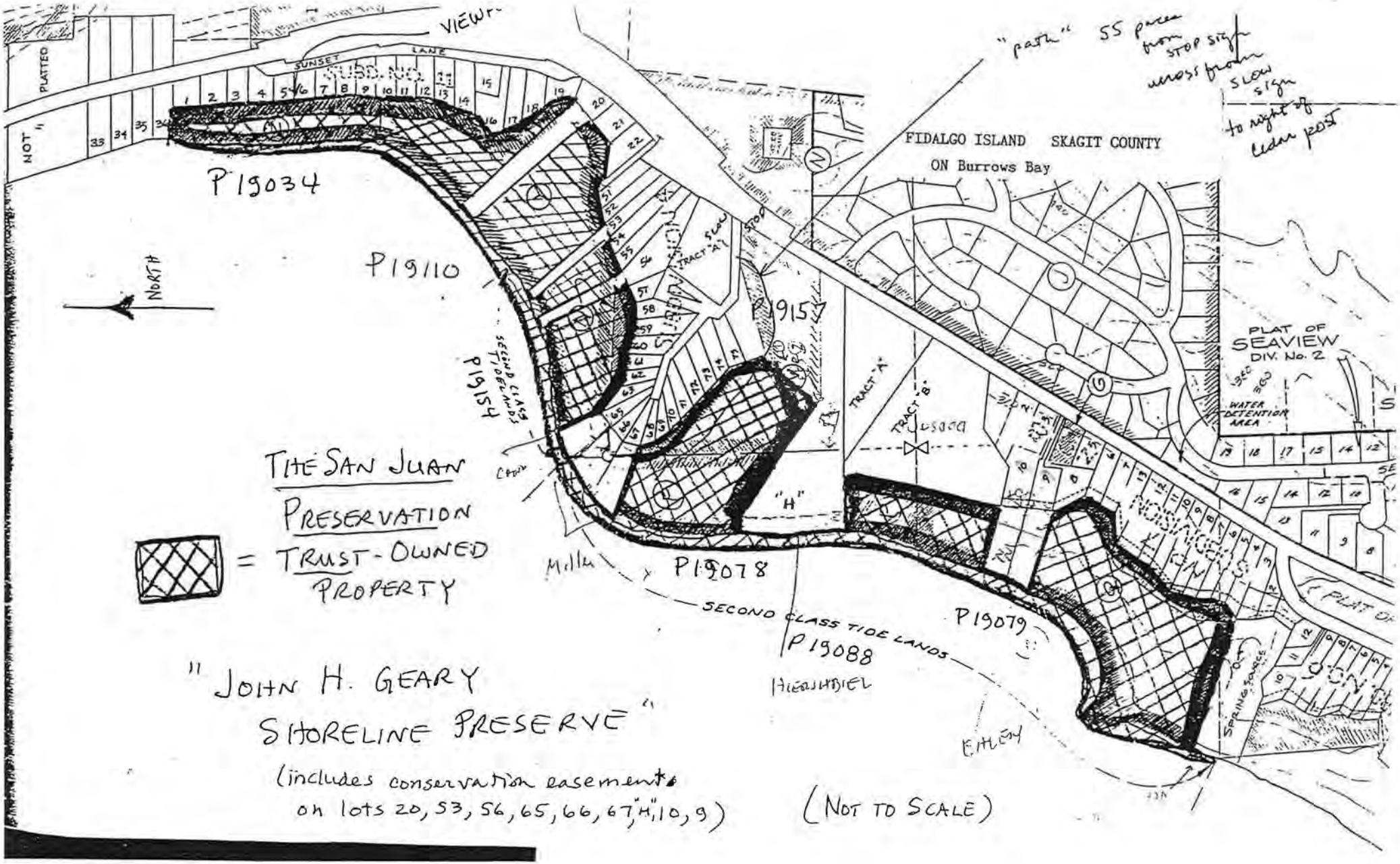
SOURCE: U.S. GEOLOGICAL SURVEY, DECEPTION PASS, WASHINGTON, NW/4 DECEPTION PASS 15' QUADRANGLE, 1978; COASTAL ZONE ATLAS OF WASHINGTON, 1978.

0 2000 4000
SCALE IN FEET

N

Geo Engineers

Havlosh Rd
Marine Dr
Lake E


FIDALGO ISLAND SKAGIT COUNTY
ON Burrows Bay
PLAT OF SEAVIEW DIV. No. 2
WATER DETENTION AREA
SUNSET LANE
SUBD. NO.
PLATTED
NOT
VIEW
"path" 55 paces from STOP sign across from SLOW sign to right of cedar post
P19034
P19110
P19154
P19157
P19078
P19088
P19079
NORTH
TRACT "A"
TRACT "B"
TRACT "X"
"H"
SECOND CLASS TIDE LANDS
SPRING SOURCE
THE SAN JUAN PRESERVATION TRUST-OWNED PROPERTY
= TRUST-OWNED PROPERTY
"JOHN H. GEARY SHORELINE PRESERVE"
(includes conservation easements on lots 20, 53, 56, 65, 66, 67, "H", 10, 9)
(NOT TO SCALE)

ws Bay
Lake Erie
Sharpe
Park

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APR 14 2016
SKAGIT COUNTY
PDS

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

Subarea Plans

The following subarea plans are a part of this Comprehensive Plan and are available from the Skagit County Planning & Development Services Comprehensive Plan webpage at www.skagitcounty.net/planning:

- *Alger Community Plan*
- *Bayview Ridge Subarea Plan*
- *Guemes Island Subarea Plan*
- *Hamilton Subarea Plan*

This listing ignores the following watershed subarea plans paid for and approved by DOE. (Frontspiece pages attached.)

Lower Skagit River Basin - 11/93
Nookachamps Watershed Nonpoint Action Plan 5/95
Padilla Bay / Bay View Watershed Nonpoint Action Plan 5/95
Samish Bay Watershed Nonpoint Action Plan -- 12/95
(The Alger Plan assumed the Samish Plan was the geographical point of reference, so such info was not included in the Alger Plan.)
No reference to Natural Hazard Mitigation Plan, 3rd ed. 2015

Ehlers

LOWER SKAGIT RIVER BASIN

WATER QUALITY STUDY

FINAL REPORT

SEPTEMBER 27, 1993

Prepared for
Skagit County Department of
Planning and Community Development

and

The State of Washington Department of Ecology
Grant Number - TAX91034

by

Entranco
Bellevue, Washington

Revised and Edited by
Skagit County Department of Planning and Community Development
November 1993

This project was funded by a grant from the State of Washington Department of Ecology Centennial Clean Water Fund (75 percent), and by local funds (25 percent) provided by the Skagit County Department of Planning and Community Development.

3/28/96 PC

NOOKACHAMPS WATERSHED NONPOINT ACTION PLAN

ECOLOGY APPROVED

MAY 18, 1995

WASHINGTON STATE DEPARTMENT OF ECOLOGY

PREPARED BY:

The Nookachamps Watershed Management Committee
and
The Skagit County Department of
Planning & Community Development

This project was funded by a grant from the State of Washington Department of Ecology Centennial Clean Water Fund (75 percent), and by local funds (25 percent) provided by the Skagit County Department of Planning and Community Development.

2/27/96

PADILLA BAY/BAY VIEW WATERSHED NONPOINT ACTION PLAN

ECOLOGY APPROVED

MAY 30, 1995

WASHINGTON STATE DEPARTMENT OF ECOLOGY

PREPARED BY

THE PADILLA BAY/BAY VIEW WATERSHED MANAGEMENT COMMITTEE
AND
THE SKAGIT COUNTY DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

This project was funded by a grant from the State of Washington Department of Ecology Centennial Clean Water Fund (75 percent), and by local funds (25 percent) provided by the Skagit County Department of Planning and Community Development.

= major reference sections
Table of Contents, recommendations
Bibliography/References
Appendices
Best Management Practices
List of concurrent responses

= laws + maps
green tags show laws in text. existing or to be developed

= problems/solutions
chapters
8 - problems
9 - implementation
10 - unfinished agenda
app. L - comments on above

SAMISH BAY WATERSHED NONPOINT ACTION PLAN AND FINAL CLOSURE RESPONSE STRATEGY

ECOLOGY APPROVED

DECEMBER 1995

WASHINGTON STATE DEPARTMENT OF ECOLOGY

PREPARED BY

THE SAMISH WATERSHED MANAGEMENT COMMITTEE
AND
SKAGIT COUNTY DEPT. OF PLANNING AND COMMUNITY DEVELOPMENT

THIS PROJECT WAS FUNDED BY A GRANT FROM THE STATE OF WASHINGTON DEPARTMENT OF ECOLOGY CENTENNIAL CLEAN WATER FUND (75 PERCENT), AND BY LOCAL FUNDS (25 PERCENT) PROVIDED BY THE SKAGIT COUNTY DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

Sole Source Aquifer
Sole Source Aquifer is an EPA definition. It defines those areas where more than 50 percent of the drinking water is obtained from the groundwater.

? Was it not the USGS that determined the sole source of fresh water on Guemes came from rain? It was not augmented by an underground lava tunnel from Mt. Baker, they determined.

Species of Local Importance
Those species that may not be endangered, threatened or sensitive from a statewide perspective, but are of local concern due to their population status, sensitivity to habitat manipulation, or other educational, cultural or historic attributes.

Special Needs Populations
Populations with special needs in Skagit County include the mentally ill, with chemical dependency, developmentally disabled, persons with drug and/or alcohol addiction, victims of domestic violence, youth, the elderly and farmworkers.

Suburban
Blending or characterized by the blending of the urban and the rural. A land use development pattern that is dispersed as opposed to decentralized.

Sub-Area Planning/Community Planning
Subarea plans, also called community plans, are more detailed plans for smaller geographic areas within the County. Community plans focus on local issues, problems and opportunities, and may address land use, economic, social and other issues of local concern, at a finer level of detail than in the general policies of the Comprehensive Plan.

Transfer of Development Rights (TDR)
The transfer of the right to develop or build, expressed in dwelling units per acre, either on land within one zoning district under contiguous ownership, or from land in one zoning district to land in another district where such density/development is permitted.

Transit
A general term applied to passenger rail and bus service available for the use by the public and generally operated on fixed routes with fixed schedules.

This Appendix from the 2007 Plan must be updated and restored.

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APPENDIX C

DESCRIPTIONS OF RELATED PLANS, STUDIES AND REGULATIONS

I. COUNTYWIDE COMPREHENSIVE PLAN POLICIES

These adopted policies support the thirteen state mandated Growth Management Act (GMA) goals. GMA goals guide the development and adoption of Comprehensive Plans and development regulations of counties and cities planning under this act. The planning goals include the following: urban growth, reduce sprawl, transportation, housing, economic development, property rights, permits, natural resource industries, open space and recreation, environment, citizen participation, public facilities and services and historic preservation.

A. Sub-Area Plans

This is where sub-area plans will be discussed when they are developed.

B. Special Purpose or Special Function Plans Adopted separately from the Comprehensive Plan

1. 1976 Skagit County Shoreline Management Master Program

This plan promotes the public health, safety and general welfare by providing long range, comprehensive policies and effective, reasonable regulations for development and use of Skagit County shorelines.

2. 1993 Skagit County Drainage Study, Draft Capital Improvement Plan (Vol. I)

Report includes a summary of the capital improvement plan that summarizes the recommended projects and costs for the study areas of South Burrow Bay, Jackman Creek, Hill Ditch and North Samish; a statement of the methodologies used to rank the problem areas, to perform the hydrologic and hydraulic analyses and to prepare cost estimates and the studies, alternatives and recommendations for each of the study areas.

re: UGA

~~conform to those urban development standards in effect within the respective municipality as of April, 1, 1999. Bayview Ridge UGA urban standards for roads, sewer, and stormwater shall meet or exceed those in effect in the City of Burlington on April 1, 1999. UGAs with populations of over 1500 or a Commercial/Industrial land allocation (new) over 100 acres shall have, as a minimum, the following levels of urban law enforcement and fire service levels:~~

~~Law Enforcement:~~

~~One commissioned law enforcement officer per 1,000 population served or per 100 acres of developed commercial or industrial property, whichever is the higher number.~~

~~Fire:~~ Fire: must have an official relationship negotiated between rural district + city in UGA. See problems of Anacortes + District 13 as example.

~~Urban fire level of service standard for Urban Growth Areas are as follows:~~

~~1. For Cities and their adjacent Urban Growth Areas, an ISO grading of 5 or better shall be maintained; otherwise2. Within 5 minutes of being dispatched, the Fire Department shall arrive and be able to deliver up to 200 gallons per minute fire flow in an offensive (interior) attack, with a minimum of 4 firefighters, for responses to: structural fires, vehicle fires, other outside fires, motor vehicle accidents, activated fire alarm systems, or other hazardous conditions. The Fire Department shall also be capable of delivering a minimum of Basic Life Support including defibrillation, with a minimum of one First Responder or Emergency Medical Technician, for medical responses.~~

~~Within 10 minutes of being dispatched, the Fire Department shall be able to support the interior structural fire attack with teams which may include: a ventilation team, a search & rescue team, a team for a backup line, and standby firefighters, totaling between 8 and 12 firefighters on scene. The Fire Department shall also be capable of providing Heavy Rescue capability, including heavy hydraulics, at Motor Vehicle Accidents.~~

~~Within 20 minutes of being dispatched, the Fire Department shall be capable of delivering 1500 gallons per minute fire flow in a sustained defensive attack mode for structural fire responses. For buildings larger than 10,000 square feet, the Fire Department shall be capable of delivering 2000 Gallons per Minute, and shall have an elevated master stream capability.~~

~~These requirements shall be met for 90% of all incidents.~~

~~Mutual aid requested under the Mutual Aid Contract may be used to provide relief to the initial operating crews, but shall not be used to provide initial attack capability, support functions, or sustained attack capability. This does not preclude automatic aid agreements under separate contract which does provide these capabilities or functions from other agencies.~~

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may dictate a smaller maximum expansion. Expansions greater than 1,500 square feet shall not be allowed if the following criteria cannot be met:

(i) – (vi) *No change.*

(e) *No change.*

(5) *No change.*

(6) *No change.*

NC-1 Maximum Lot Coverage in Rural Reserve

14.16.320 Rural Reserve (RRv).

(1) Purpose. The purpose of the Rural Reserve district is to allow low-density development and to preserve the open space character of those areas not designated as resource lands or as urban growth areas. Lands in this zoning district are transitional areas between resource lands and non-resource lands for those uses that require moderate acreage and provide residential and limited employment and service opportunities for rural residents. They establish long-term open spaces and critical area protection using CaRDs as the preferred residential development pattern.

(2) *No change.*

(3) *No change.*

(4) *No change.*

(5) Dimensional Standards.

(a) – (f) *No change.*

(g) Maximum lot coverage: ~~35%~~ 50,000 sq ft or per the table below, whichever is less:

Lot Size	Maximum Lot Coverage
< 1 acre	35%
≥ 1 acre and < 5 acres	25%
≥ 5 acres and < 10 acres	15%
≥ 10 acres	5%

(6) *No change.*

This is the only Code section I have had time to review. The changes in (5) are an excellent improvement.

From: Chris Elder
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Tuesday, April 05, 2016 1:32:40 PM

I am writing in reference to the land west of Janicki Fields. I own the piece of property in the middle of these two pieces. I have no issue with the land use being changed to public use. However I do have a few concerns.

Since I do live directly to the west of Janicki Fields, my family and I see a lot of activity. Most of the time it is kids and families using the fields. We do witness other activities as well. We have seen and reported people camping, not only tent but vehicles as well. We have seen suspected drug activity. That too was reported. When the parking lot was full during a tournament a suspected drug exchange occurred in our driveway. We have witnessed quite a few people publicly urinate in the southwest corner of the parking lot. This is directly in front of our living room window. Both men and women have done this, my children have often been witness to this behavior.

Brickyard creek has been a buffer for me. The proposed land is adjacent to me on the west side. I have concerns of people having access to my property. I am happy with idea of public use but worry about the ones that will abuse it. Will there be a fence? Will it be gated at night?

Thank you for your time.

Chris E. Elder
22400 Cook Rd
Sedro-Woolley, WA 98284

From: Erbstoeszer
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Wednesday, April 13, 2016 1:34:55 PM

Comments regarding:
Skagit County Comprehensive Plan 2016 Update

Comments provided by: Marie and John Erbstoeszer.

We have lived at 217 E. Division Street in Mount Vernon, WA 98274 since 1975. We moved to Skagit County as young healthcare professionals desiring a place that would provide us with opportunities to use our training and skills, offer needed services to the residents of Skagit County and be a good setting to raise a family and enjoy the area. John worked as a family practice MD and I worked as a Consultant in Health Services Planning and Development. Skagit County not only met but exceeded our expectations and continues to be where we call home and continue to live after 40 plus years. Many of the attributes such as the natural environment, the small towns, the friendliness, the rural settings, the access to wonderful outdoor recreation that attracted us to Skagit County are still here today but none of these can be taken for granted. Therefore, we are very pleased and encouraged by the overall planning that Skagit County is engaged in as it updates its Comprehensive Plan for 2016.

Our careers in health care and our personal interests have highlighted how important it is to have access to health, wellness and physical activities. Public Health publications frequently cite the benefits and importance of regular exercise as a means of improving and maintaining the health of the public. Access to walking and bicycling facilities are among the excellent ways of addressing some population health issues such as general health, heart health, obesity, etc. A healthy community / County must have and encourage opportunities for exercise such as by walking, bicycling, etc. We are pleased to see that the Comprehensive Plan Update includes sections such as:

- A new policy encouraging implementation of the County's UGA Open Space Concept Plan;
- Additional policies, narrative, and project descriptions related to the non-motorized transportation system;
- Some changes to the Comprehensive Plan's Environment Element addressing climate change, regional ecological assessments and biodiversity.

With regard to the transportation section, it is very appropriate that the County is supporting a multi-modal transportation system which includes not only motorized vehicles but also non-motorized options for pedestrians and bicyclists. In particular, we are encouraged and supportive of: Chapter 2, Urban Land Use and Open Space Element, policies 2A-6.2, 2A-6.3, and 2B-1.3 (proposed new language) which are good underpinnings for a multi-modal transportation system. In Chapter 8. The Transportation Element, new or revised policies 8A-6.4, 8A-6.6, 8A-6.11, and 8A-6.12, as well as several paragraphs of new narrative regarding non-motorized transportation in the Profile section and the revised Appendix C all receive our endorsement and support. All of the above are important for an effective comprehensive multi-modal transportation plan.

A suggestion that we have for improvement is that although the Comprehensive Plan Update includes many excellent ideas; it does not include any specifics or benchmarks regarding implementation plans or schedules. In particular, we are interested in the non-motorized elements. In general, the Comprehensive Plan does talk about public involvement / participation and we think that the non-motorized element planning is an area where public involvement could provide important assistance, ideas, and also help in setting priorities. A volunteer citizens group or task force could be useful in developing a master pedestrian and bicycle plan.

We are also very supportive to see that the Introduction Section on pages 18-24 included the discussion of Planning for Tomorrow and the review of "The Vision: A Comprehensive and Balanced Planning Approach." We believe each of the cited Themes in this section are important for the future of Skagit County. In addition, we are pleased to see that the excellent reference to Envision Skagit 2060: Looking forward to the next 50 years is also included. As that section notes, many of the same themes from the 1990's visioning processes where reinforced by a planning and visioning process the County undertook between 2009 and 2012 called Envision Skagit 2060.

Skagit County is a great place to live, work, and play. Plus, it is increasingly becoming a visitor's destination for recreation. We need to make sure it continues to be each of these attributes for many generations to come.

Thank you for considering our comments.

Marie Erbstoeszer, MHA
John Erbstoeszer, MD

217 East Division Street
Mount Vernon, WA 98274

April 13, 2016

From: Christy Erickson
To: PDS comments
Subject: comprehensive plan 2016 update - comment re- edison granary
Date: Saturday, April 09, 2016 9:12:51 AM

---

hello

my name is christy erickson (mary christine erickson) and i am a home owner as well as a business owner in edison washington. i am writing to share my support for the proposed improvement and re-designation of the edison granary property. marty and sadie are creating a wonderful new gathering place and it will enrich the fabric of this community.

my home address

5548 smith road
edison washington 98232

my business

hedgerow
5787 cain's ct
edison, wa 98232

thank you
christy erickson

Tom & Juby Fouts
6443 Nootka Lane
Guemes Island
WA 98221

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Planning and Development Services
Comprehensive Plan 2016 Update
1800 Continental Place
Mount Vernon WA 98273

Phone 360-293-2704
Mobile 360-770-9731
Email jubyfouts@hotmail.com

Dear Planning & Development Services,

In the 12 years we have been living on Guemes Island we have been impressed not only with the Island's beauty, but the vibrant community the Island supports.

NOW THE COMMUNITY WANTS TO LEGALIZE ITS SUPPORT OF THE ISLAND'S BEAUTY AND SUSTAINABILITY

This can be done when the Skagit Planning Department implements the 2016 COMPREHENSIVE PLAN UPDATES.

Many residents of Guemes Island have worked hundreds of hours to insure the sustainability and viability of our island not only by working on the Comprehensive Plan, but also by working on our own properties and public lands through good stewardship of forests, beaches, and habitat. With this in mind, we support codification of the Seawater Intrusion Policy; this is an important step toward protection of the island's sole source aquifer upon which we all rely for water supply. More work is needed in this regard - and we especially want to see steps taken to authorize rainwater collection as an alternative water source.

Years have passed since the county accepted the Guemes Island Comprehensive Plan. It is past time to validate the acceptance by codification of the 2016 Update.

Thank You for your attention to this matter,

Juby Fouts
Tom Fouts

Tom & Juby Fouts

From:	Nancy Fox
To:	PDS comments
Subject:	Comprehensive Plan 2016 Update -- Comments
Date:	Thursday, March 31, 2016 2:32:12 PM

TO: Planning and Development Services
1800 Continental Place, Mount Vernon WA 98273

FROM: Nancy Fox, Chair, Guemes Island Planning and Advisory Committee
7202 Channel View Drive, Anacortes, WA 98221

Re: Comments on the Proposed 2016 Comprehensive Plan Update

On behalf of the Guemes Island Planning and Advisory Committee (GIPAC), I am writing to offer comments on the County's proposed 2016 Comprehensive Plan Update. We have focused our review on two sections of proposed code which are part of the update – the Guemes Island zoning overlay and the new Critical Areas Ordinance section pertaining to Seawater Intrusion. We are strongly in favor of these proposals and want to thank County staff for working with us toward implementation of the Guemes Island Sub-Area Plan ("Guemes Plan").

Attached are two issue papers that provide more detailed background on the history of the Guemes Plan and its recommendations relating to land use and saltwater intrusion. (We will provide copies for you at the April 5th public hearing.) This comment letter provides a summary.

Guemes Island Zoning Overlay

Like other sub-area plans in unincorporated Skagit County, such as those for Bayview and Alger, the Guemes Island Sub-Area Plan seeks to tailor countywide plans and development regulations to meet the particular needs of this small island community.

To quote the Guemes Plan: "The overall goal of this sub-area plan is to allow growth that will conserve the island's groundwater resources, rural character, and sense of community." The plan seeks to allow development that reflects the historic low scale of development on the island protects the island's sole source aquifer, which is already experiencing degradation through saltwater intrusion. Buildings built to maximum potential under current zoning would be vastly out of scale with most existing homes on the island and could put untenable strain on the island's limited water resources.

We support the proposed Guemes Island Zoning Overlay, which incorporates several key recommendations from the Guemes Plan:

1. Prohibit **Accessory Dwelling Units** (ADUs) on Guemes Island in areas where the water source contains 25 ppm or more chlorides from groundwater.

Comment: GIPAC's concern regarding this issue is that even relatively low levels of chlorides indicate that seawater intrusion is already occurring in an area. ADU's drawing additional water from the aquifer can only exacerbate

seawater intrusion problems in these areas. Rainwater collection systems or properly designed reverse osmosis systems can be utilized to serve ADU's in areas where the groundwater is compromised.

2. Limit **building height** and increase **side setbacks**: establish a height limit of 12' at the side setback, rising 1' for each additional 1' distance from the side setback up to a maximum height of 30'; and require side setbacks totaling 30 percent of the lot width or 30 feet (whichever is less) for the combination of the two side-yards, with an eight-foot minimum setback on each side.

Comment: These standards are intended to keep views open, avoid tall building walls close to neighboring properties and generally reduce incompatibility between smaller existing homes and larger new homes, particularly on small lots. A 40' tall house, allowed under current zoning, would be significantly out of scale with the existing low scale of development on the island and would represent a significant conflict with the island's rural character. This height and setback provision will help mitigate the impact of new development across the island.

Issue considered: GIPAC is aware that the side setback height limit might be difficult to meet on narrow lots in flood-prone areas such as are found in some beach locations on the West shore of the island. However, we understand that the County's proposal to allow 50% reduction in setbacks through a simple administrative variance will provide a mechanism for addressing this issue; if a 50 percent reduction in setback is granted, each sidewall at the 8' setback line could be 16' tall (12' plus 4 additional feet due to 4' setback reduction) which is sufficient to allow a full story above flood elevation. Further, while not encouraging variances, GIPAC hopes the County will take into consideration the impact of pre-existing development (some of which has occurred in the 5 years since the Guemes Plan was adopted) as well as the underlying purposes of this height and setback regulation in considering any other variances that are requested.

3. Solid **fences** higher than three feet must be set back a minimum of ten feet from the street front right of way. "Solid fences" means any fence that is less than 50 percent open.

Comment: The purpose of this requirement is to protect sight distances at driveway entrances for pedestrian safety and, in addition, to preserve views of the water and generally throughout the island.

4. We are concerned that one additional recommendation from the Guemes Plan has not been included in the County's proposed code amendments:

"On Guemes Island, any **open space designated through a CaRD must be permanently preserved** through filing of a protective easement or covenant on the property prior to final subdivision approval."

Comment: In conversation with County staff, we understand that this recommendation may have been overlooked in the drafting of the Comprehensive Plan update and development regulations; we would still like to have this Guemes Plan recommendation incorporated into the County land-use regulations. While our initial idea was to incorporate this requirement in the

Critical Areas Ordinance, Aquifer Recharge Areas Impact Mitigation section, there are alternative locations in the code where it could be addressed. We understand the provision will need to be integrated with other aspects of the CaRD code relating to open space.

Our objective is to make sure that open space set-aside through a CaRD on Guemes Island does not later become available for more housing and development. The CaRD process already confers significant benefits to a property owner, in the form of relaxed development standards. This allows the owner more options for lot configuration, often maximizing views and beach access and thereby increasing lot values. In return for this benefit, a property owner designates open space for conservation. Just as the benefits to a property owner are permanent, the open space set-aside should be permanently protected. Given its groundwater limitations and its location outside the urban growth boundary, Guemes Island is not an appropriate location to reserve such lands for future urban development.

Seawater Intrusion Code

We are pleased to see and support the proposed **Seawater Intrusion Areas** Section 14.24.380 in the Critical Areas Ordinance (CAO). Incorporating and codifying the previous Interim Seawater Intrusion Policy into the CAO was a priority recommendation in the Guemes Plan.

Key recommendations from the Plan that are incorporated into the new draft chapter are:

1. Pumping Rates.

GIPAC supports the County's lowered pumping rates set forth in Table 14.24.380-1 of the proposed new Title.

2. Reverse Osmosis Systems.

GIPAC similarly supports the County's proposed code language for reverse osmosis systems set forth in the proposed new Title 14.24.380(3)(b).

3. Water Meters.

GIPAC supports new Title 14.24.380(4)(a)(i), which requires well drillers to install a meter on new and existing wells.

Comment: Water meters are very useful in promoting voluntary water conservation and enabling property owners to identify leaks that could adversely affect the aquifer. We would support requiring meters on existing wells which do not already have them. <u>In Public Water Systems where more than two homes are served by a well, we support requiring meters on each service connection in addition to metering the wellhead</u>.

Additional Work Ahead

We understand that additional work is needed to address critical groundwater issues on Guemes Island, beyond that which County can tackle with the Comprehensive Plan 2016 Update. GIPAC encourages the County to move

ahead with this work as soon as possible following the Comprehensive Plan update, and we stand ready to work collaboratively with the County in this effort.

1. Rainwater Collection.

Giving preference to rainwater collection systems and discouraging new wells is a top priority for Guemes Island. Therefore, GIPAC is pleased to see the County expressing its intent to **encourage alternatives to wells in areas of known seawater intrusion** in Title 14.24.380(3)(a). However, without changes to the Public Health Code, chapter 12.48 on wells and drinking water systems, County code will continue to officially discourage rainwater collection systems and impose regulatory barriers that undermine the feasibility of such systems. As an example, the code currently requires a building permit applicant proposing an alternative water system to first provide documentation that a public water system or drilled well cannot be utilized, typically requiring a well to be attempted before a rainwater catchment system can be considered.

Comment: Given the history of documented seawater intrusion over past 35 years in the north part of Guemes, and experience with drought in summer of 2015, GIPAC believes it is critical to codify approval of water catchment systems as an alternative to wells. We realize that addressing this issue will take more time than is available for the 2016 Comp Plan Update, but GIPAC believes SCC 12.48 should be revised as soon as possible, and we would like the County to commit to a timetable for this work in the second half of 2016.

Our goal is to have the County declare that "rainwater collection is the preferred water source on the north end of Guemes where seawater intrusion is a critical problem." No new wells should be drilled without documenting the lack of feasibility of a rainwater collection system.

2. Definition of Adequate Water Supply.

GIPAC recommendation: Modify SCC 12.48.030 to reduce the required water supply from 350 gallons/day to 150 gallons/day for Guemes Island.

Comment: This topic is linked to the rainwater collection issue discussed above. The current requirement of 350 gallons/day creates an unnecessary hurdle, making rainwater collection systems infeasible on many small lots. A rainwater collection system designed to produce 150 gallons/day is considerably smaller and less expensive to build than if the house owner has to produce 350 gallons/day. Furthermore, it is irresponsible to encourage homeowners to use 350 gallons of water per day on an island which is designated a sole source aquifer and which has long suffered seawater intrusion.

San Juan County, which encourages rainwater collection systems, requires only 200 gpd for adequate water supply. 2012 data (the most recent available) from Holiday Hideaway, the largest residential area on Guemes, shows that most houses use an average of under 110 gpd, and part time residences use considerably less.

3. Enforcement of the Seawater Intrusion Code

As noted above, GIPAC supports the codification and updating of the Seawater Intrusion Policy as proposed by the County, and this is definitely a step in the right direction. Lower pumping rates, careful location and design of wells, and the requirement for impact mitigation in Aquifer Recharge Areas such as Guemes Island are all important measures to insure the long-term health of our sole source aquifer.

However, there is a serious gap in the code that undermines the application and enforcement of these mitigations. At present, there is no permit requirement or other trigger to insure that the well drilling requirements of the Seawater Intrusion Code are applied **prior to** the drilling of a new well; instead, the requirements apply only when an application is submitted for development proposing "use of" a well. This means that new wells can be drilled prior to any development application, without consideration of locational factors, well depth, or alternative sources of water such as rainwater collection that might help mitigate seawater intrusion impacts. We consider this to be a significant hole in the regulations, and hope that this gap can be filled in your next phase work on the Public Health Code.

Thank you for considering our comments on the 2016 Comprehensive Plan Update, and our priorities for additional work needed to address critical issues on Guemes Island.

April 5, 2016

Land Use on Guemes Island

Guemes Island is a small island community across Guemes Channel from the City of Anacortes, with a year-round population of about 700 people and a total population including part-timers of 2,000 – 3,000. Its unique character in Skagit County led to development of a sub-area plan aimed at addressing Guemes Island-specific planning issues and needs. The County's 2016 Comprehensive Plan Update, currently under development, provides an opportunity to address these island-specific needs and implement the adopted Guemes Island Sub-Area Plan.

History of Planning on Guemes Island

- A community-based planning committee began work on a sub-area plan in 1991, in response to the recently enacted Washington State Growth Management Act (GMA).

- The Skagit County Comprehensive Plan of 2000, developed under the GMA, called for Guemes Island to be a "Rural Area of More Detailed Planning." Guemes was deemed appropriate for subarea planning because it is an island with distinct physical boundaries whose rural character is shaped by its dependence on a ferry for access and groundwater for drinking water. Issues to be considered in the plan include (among others) rural character, land use, shorelines, and natural resources.

- In 2003, the Skagit Board of Commissioners adopted a resolution endorsing the community-elected Guemes Island Planning Advisory Committee (GIPAC) as the "Community-Based Representative" for purposes of obtaining funds and initiating a sub-area plan for the island.

- Overall, the plan took nearly 20 years to develop. During this time, GIPAC conducted broad public outreach including a written survey and numerous public meetings, undertook a Visual Planning Survey, completed a Rapid Shoreline Inventory with support from People for Puget Sound and funding from the Skagit County Marine Resource Committee, and brought in the American Institute of Architects (AIA) to conduct a 3-day planning workshop and make planning recommendations. Dozens of islanders contributed to the plan's development, and hundreds of islanders participated in the public process.

- The Skagit County Board of Commissioners adopted the Guemes Island Sub-Area Plan in January 2011. At that time, the County indicated that it would take up implementation of specific land use and shoreline recommendations

as the county made updates to its various development codes and elements of the comprehensive plan.

Guemes Island Is Unique

Like other sub-area plans in unincorporated Skagit County, such as those for Bayview and Alger, the Guemes Island Sub-Area Plan seeks to tailor countywide plans and development regulations to meet the particular needs of this small island community. There are numerous factors that, taken together, make Guemes Island unique in Skagit County and contribute to the need for land use regulations that are locally adapted.

Island Constraints and Culture: The first consideration is obvious -- Guemes is an island surrounded by marine waters – a trait that distinguishes it from the vast majority of Skagit County. As noted in the 2000 Skagit County Comprehensive Plan: Guemes is appropriate for sub-area planning because it is an island with distinct physical boundaries whose rural character is shaped by its dependence on a small County ferry for access and groundwater for drinking water. Other limitations on public services for the island, such as the absence of a public safety presence and lack of a public sewer system, represent further constraints to development.

Sole Source Aquifer: Because almost all homes on Guemes get their water from an underground aquifer, protecting the quality of groundwater resources is a critical island concern. The island's groundwater has been designated a "sole source aquifer" by the Environmental Protection Agency, a designation which indicates there are no reasonably available drinking water alternatives should the aquifer become polluted. Furthermore, all of Guemes Island has been designated as a Category I Aquifer Recharge Area under the Critical Areas Ordinance, indicating that the aquifer needs protection from future land uses that pose a risk to the quality or quantity of the aquifer.

Unfortunately, Guemes' aquifer is already degraded – with seawater intrusion at various island wells being documented by the State Department of Ecology since the 1980's. Seawater intrusion occurs as a result of over-pumping, with more water being withdrawn from the aquifer as more homes are built and existing homes are expanded. Because its water supply is limited, Guemes cannot accommodate an unlimited amount of growth and development.

Historic Pattern of Development: Guemes Island is a rural community of mostly small-scale, 1-1/2 story homes, with many beach cottages and other homes occupied by part-time residents. Allowable building size under current zoning is significantly larger than most island homes.

Much of the land on Guemes was platted prior to the Growth Management Act, with relatively small lots particularly along the shoreline. Many lots are considerably

smaller than the minimum lot sizes allowed under current zoning. The development standards for these zones do not reflect the actual size of lots on Guemes, nor the existing scale of development.

While allowing continued growth on the island and new houses that are larger than the historic scale of development, the Guemes Sub-Area Plan calls for adjusting some development standards in order to protect the rural character of the island and avoid dramatic incompatibilities in the scale of development.

Detailed local planning completed: As noted above, the Guemes community has worked together for more than two decades to survey conditions on the ground and assess its local planning needs. In partnership with the County, neighborhood volunteers have invested thousands of hours developing neighborhood-appropriate planning policies. The plan was extensively vetted with the county, and ultimately approved by the Board of County Commissioners. Localized planning has been completed; it is now time for the County to follow through with implementation.

Proposals Incorporated in 2016 Comprehensive Plan Update

The following code changes are proposed to implement the Guemes Island Sub-Area Plan. These proposals are incorporated in the scope of the 2016 update of the Skagit County Comprehensive Plan.

A. Amend 14.18.310 CaRD General Approval Provisions to state that there shall be no density bonus for CaRD developments on Guemes Island.

Comment: This provision has already been incorporated in SCC 14.18.310, CaRD General Approval Provisions, as well as SCC 14.24.340, Critical Areas Ordinance Aquifer Recharge Areas Mitigation. GIPAC supports maintaining these code provisions.

B. Add to SCC 14.24.310: Guemes Island is designated as a Category I Critical Recharge Area under SCC 14.24.310; therefore all applications for single-family residential building permits, including Accessory Dwelling Units and Accessory Buildings as well as residential short plats; and building permits for any other uses that require or could impact groundwater resources, shall comply with the Site Assessment Requirements as outlined in SCC 14.24.330. **Amend SCC 14.24.330(1)** to require that initial project review by the Skagit County Planning and Development Services Department shall include staff from the County Health Department and a County Staff Hydrogeologist to evaluate likely impacts to groundwater quality or quantity.

Comment: Groundwater impacts need to be given careful, interdepartmental review at the earliest stages of the building permit process.

C. Amend SCC 14.16.710 to prohibit Accessory Dwelling Units (ADUs) on Guemes

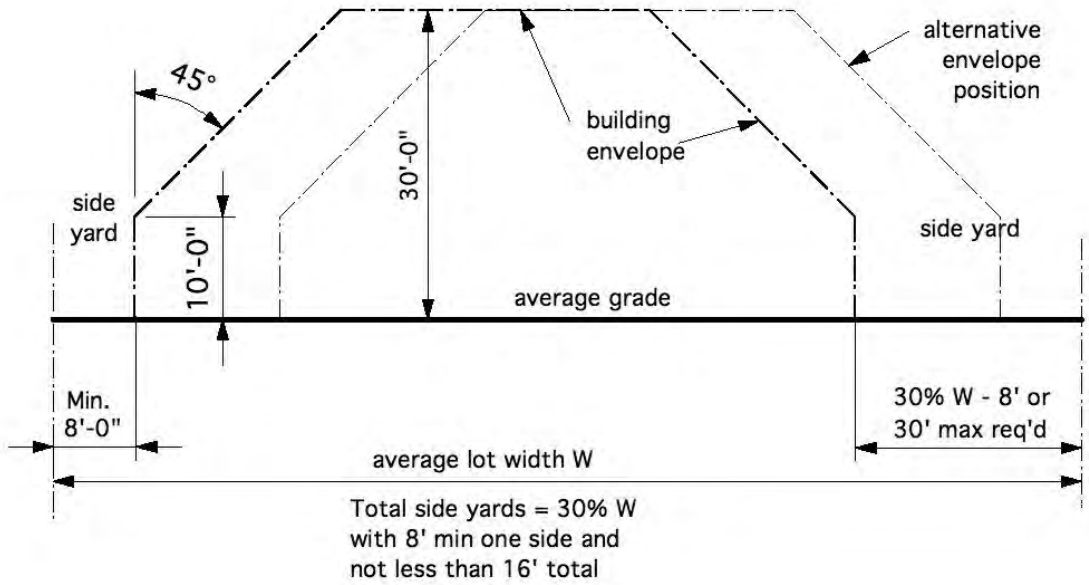
Island in areas where the water source contains 25 ppm or more chlorides.

Comment: GIPAC's concern regarding this issue is that even relatively low levels of chlorides indicate that seawater intrusion is already occurring in the area. Skagit County itself identifies 25 ppm chlorides as a key threshold in its Seawater Intrusion Policy (see table 1, draft SSC 12.48.265), defining the chloride level at which poor water quality requires lower well pumping rates. ADU's represent more density, and therefore more or bigger "straws" into the aquifer, which can only exacerbate seawater intrusion problems in these areas.

GIPAC's primary concern is the impact that ADU's can have on surrounding wells and the larger aquifer, more than the risks to the individual property owner who wants to use well water for the ADU. Therefore GIPAC agrees with the County's proposal to fold this regulation into the Critical Areas Ordinance in its draft section 12.48.265(3)(c). SCC 14.16.710 of the Zoning Code, Accessory Dwelling Units, should also be amended to include reference to this new section of the Critical Areas Ordinance.

It should be noted that, in areas of seawater intrusion, property owners would still have the option of utilizing rainwater collection or a reverse osmosis system to serve an ADU.

D. Amend SCC 14.16.320 Rural Reserve (RRv) and SCC 14.16.300 Rural Intermediate (RI): to require side-yard setbacks totaling 30 percent of the average width of the lot or 30 feet (whichever is less) for the combination of the two side-yards, with an eight-foot minimum setback on each side; and to establish a 12-foot height limit at each side-yard setback line, with one additional foot of building height allowed for each foot inside the required side- yard setback, up to the maximum height of 30 feet. Illustration follows. (Note: since this diagram was developed, proposed height limits at side yard setback have been increased from 10' to 12", to give property owners more flexibility.)



Comment: The proposed setbacks and building envelope are intended to keep views open, avoid tall walls close to the property line and generally reduce incompatibility between smaller existing homes and larger new homes, particularly on small lots.

E. Amend SCC 14.16 to create a new height overlay for Guemes Island, establishing a 30' maximum height limit island-wide.

Comment: Most of Guemes Island is zoned either Rural Reserve or Rural Intermediate, with a few small areas of commercial zoning. Building heights are already limited to 30' in throughout the Rural Reserve, but can go up to 40' in the other zones. Few island buildings, however, are even as tall as 30'.

A 40' building would be vastly out of scale with the existing low scale of development on the island, and would represent a significant conflict with the island's rural character. With many if not most existing homes being only 1-1/2 stories tall, a building of 40' could be twice as tall as its neighbor. The fact that many Rural Intermediate lots are much smaller than the minimum lot size for this zone makes the problem even more acute. These very small Rural Intermediate lots are mainly located on the shoreline where issues of incompatible scale and other development impacts such as view blockage would be greatest. A 30' height overlay would provide better consistency and protection for the island's character, while still allowing significantly larger buildings than most of what exists today.

F. Revise SCC 14.18.300 to require that, on Guemes Island, any open space designated through a CaRD is permanently preserved through filing of a protective easement or covenant on the property prior to final subdivision approval.

Comment: The CaRD process confers significant benefits to a property owner, in the form of relaxed development standards. This allows the owner more options for lot configuration, often maximizing views and beach access and thereby increasing lot values. In return for this benefit, a property owner designates open space for preservation. Just as the benefits to a property owner are permanent, the open space set-aside should be permanently protected.

G. Include the following requirement in the new Guemes Island height overlay, to be established in SCC 14.16: Solid fences higher than three feet must be set back a minimum of ten feet from the street front right of way. "Solid fences" means any fence that is less than 50% open. Solid fences that are within building setbacks are limited to six feet in height.

Comment: The purpose of this requirement is to preserve views of the water and generally throughout the island. In addition, it is intended to protect sight distances at driveway entrances for pedestrian safety. This type of fence regulation is not uncommon in rural communities.

**

Note: In addition to the land use recommendations above, GIPAC has submitted a number of proposed amendments to the County's Shoreline Master Program (SMP) during the update process which has been underway since 2011. GIPAC will review the draft SMP upon its release in February 2016, to determine its consistency with the adopted Guemes Island Sub-Area Plan, and may submit further recommendations.

April 5, 2016

Groundwater Issues on Guemes Island

Ground water from an aquifer is the only source of fresh water available to the large majority of residents of Guemes Island. In 1997, the federal Environmental Protection Agency designated the island's aquifer system as a "Sole Source Aquifer" under the Federal Safe Drinking Water Act. Wells provide water to nearly all the island's residents, and all of the island's wells draw from the aquifer.

According to a US Geological Survey done in 1994, the potential for seawater intrusion on Guemes is great because part of the aquifer is below sea level, the rates of recharge to the aquifer are low, and most wells are close to the shore, where the aquifer is thinnest. Seawater intrusion along some of the more densely populated coastal areas of the island has been documented since the late 1970's.

All of Guemes Island also has been designated as a Category I Aquifer Recharge Area. This designation reflects the need to provide special protection to the entire island because the County, State, or Federal Government has determined the aquifer needs protection from future land use that poses a risk to the quality or quantity of the aquifer (SCC 14.24.310 (1) (a)). Precipitation averages about 25 inches/year on Guemes; in contrast, Mt. Vernon receives about 33 inches and Sedro Woolley about 47 inches annually.

Islanders' concerns about seawater intrusion are not new. The WA Department of Ecology identified coastal seawater intrusion areas on Guemes Island in the late 1980s. Chloride levels in well water have been elevated (greater than 100 mg/L) around West Beach, North Beach, and in the west-central part of the island since the early 1990s.

Dept of Ecology letter to SC Dept of Health, May 1994. Over two decades ago, the Washington Department of Ecology was raising concerns to the Skagit County Department of Health about allowing more wells to be dug on the north end of Guemes Island.

In May 1994, Ecology wrote that: "We have concerns regarding how the County can make findings of adequacy of water in this part of Guemes Island under Section 63 of the Growth Management Act. The Antidegradation Policy, as stated in the Water Quality Standards for Ground Waters, WAC 173.200.030, ensures the purity of the state's ground waters and protects the natural environment. Permitting saline intrusion into fresh water aquifers could be a violation of the state's Antidegradation Policy, and can cause adverse water quality effects in existing wells.

"For these reasons, we would <u>recommend limiting new well construction on the north end of the island. . . . We would also recommend the county discourage wells completed within unconsolidated materials near the coast island-wide</u>."

- Despite Ecology's concerns and documented cases of seawater intrusion in the northern part of the island, Skagit County still allows wells to be dug anywhere on Guemes. Adequate water supply, generally from a well, is required as a condition for obtaining a building permit.

Protecting the groundwater resources of Guemes Island from seawater intrusion is a major concern for Guemes residents. In 2010, an island committee asked **Pacific Groundwater Group** (PGG) to assess the efficacy of both the County's Seawater Intrusion Policy and the Critical Area Ordinance (SCC 14.24) in protecting the island's groundwater resources.

The PGG concluded that the county's Seawater Intrusion Policy offers little real protection to the aquifer of Guemes Island where seawater intrusion is occurring as a result of new wells and additional development. In contrast, the County's Critical Areas code has ample language for the protection of the island's aquifer from the effects of seawater intrusion. For example, 14.24.340 requires development approvals to include conditions designed to prevent significant degradation of water quality.

GIPAC Recommendations for Inclusion in 2016 Comp Plan/Seawater Intrusion Policy.

1. Codify the Seawater Intrusion Policy and include it in the Critical Areas Ordinance, SCC 14.24.

GIPAC recommendation: "Codify the Seawater Intrusion Policy and include it in SCC 14.24 (Critical Areas Ordinance)."

Issues: GIPAC would like to see more extensive/comprehensive limits on new wells on Guemes, particularly on the north end of the island. We recognize, however, that this issue will need more time and discussion than is available now for inclusion in the 2016 Comp Plan update, so we will submit recommendations about this for the 2017 Comp Plan process.

Given the significant time constraints for consideration and approval of the 2016 Comp Plan, GIPAC is submitting the following recommendations for improvements on which we think the County could take early action as part of the 2016 Comprehensive Plan/SIP updates.

2. Rainwater Collection.

GIPAC recommendation: Revise SCC 12.48.250 to eliminate the building permit requirement for written documentation that a public water system or drilled well cannot be utilized. Further, state that "rainwater collection is the preferred water source on the north end of Guemes where seawater intrusion is a critical problem." No new wells should be drilled without documenting the lack of feasibility of rainwater collection system.

Issues: GIPAC feels strongly that water catchment systems should be encouraged. Given the history of documented seawater intrusion over past 35 years in north part of Guemes, and experience with drought in summer of 2015, GIPAC believes codifying approval of water catchment systems as an alternative to wells is a high priority.

GIPAC's recommendation differs from the Health Department's proposal in draft 12.48.265(5)(b) that an applicant proposing a rainwater catchment system as a water source for a building permit is required to demonstrate that the catchment system meets the requirements for an alternative water source in SCC 12.48.250. SCC 12.48.250 states that alternative water systems such as rainwater collection are discouraged and that applicants for alternatives must document why a well is not feasible.

3. Definition of Adequate Water Supply.

GIPAC recommendation: Modify SCC 12.48.030 to reduce the required water supply from 350 gallons/day to 150 gallons/day for Guemes Island.

Issues: The current requirement of 350 gallons/day creates an unnecessary hurdle, making rainwater collection systems infeasible on many small lots. A rainwater collection system designed to produce 150 gallons/day is considerably smaller and less expensive to build than if the house owner has to produce 350 gallons/day. San Juan County, which encourages rainwater collection systems, requires only 200 gpd for adequate water supply.

2012 data (the most recent available) from Holiday Hideaway, the largest residential area on Guemes, shows that most houses use an average of under 110 gpd, and part time residences use considerably less.

Other water consumption data, for perspective on this issue.

- Anacortes daily water consumption was 183 gallons per single family residence in 2007, the most recent data available.
- Seattle daily water consumption was 37 gal/day per capita, in 2009 (also the most recent available). If each residence had 2.5 persons, that would equate to 93 gallons/day per residence.

4. Pumping Rates.

GIPAC supports the County's lowered pumping rates set forth in Table 1 of the proposed new Title 12.48.265.

5. Reverse Osmosis Systems.

GIPAC supports the County's proposed codes language for reverse osmosis systems set forth in the proposed new Title 12.48.265(5)(b).

6. Water Meters.

Recommendation: Add to SIP: "On Guemes Island, water meters shall be required for all new development and encouraged for all existing residences."

Issues. Water meters are very useful in promoting voluntary water conservation and enabling property owners to identify leaks that could adversely affect the aquifer. This is a long-standing requirement for GIPAC in the SIP and we want it to remain in the SIP.

From: Diane Freethy
To: PDS comments
Subject: URGENT: Skagit County Comprehensive Plan 2016 Update (clean version)
Date: Wednesday, April 13, 2016 7:37:59 PM

Attention: Skagit County Planning Commission

re: Skagit County Comprehensive Plan 2016 Update (clean version)

Please amend Policy 8A-7.3, page 262, of the clean version of the 2016 Skagit County Comprehenive Plan update as follows:

Goal 8A-7 Freight & Economic Development
Policy 8A-7.3 Encourage the enhancement and expansion of freight rail service to and from economic activity centers **with priority given to the return of the Sedro Woolley to Concrete rail service to revitalize east county's economic recovery.**

Thank you!
Diane Freethy, President
Skagit Citizens Alliance for Rural Preservation

From: Diane Pony Mailbox
To: PDS comments
Cc: Nancy Fulton
Subject: Comprehensive Plan 2016 Update
Date: Thursday, April 14, 2016 1:36:02 PM

Hello

I am Diane C Fulton. I own parcel 68335 and am alongside, my brother, David C Fulton's 2 parcels 68334 & 68333

My mailing address is Diane C Fulton #68335
14121 211th St S. E.
Snohomish WA 98296

My brothers mailing address is David C Fulton#68334 & #68333
19624 Marine View Drive S.W
Normandy Park, WA 98166

I was unable to attend meeting on Tuesday April 5, 2016, as my business is open until 7 p.m. and I am the only one available to man it on Tuesdays.

My brother wasn't able to attend, either.

We have questions after having down loaded and read your 90 page proposal for the Gravel Pit Reclamation of Lake Erie Trucking/PL15-0363

They are:
1/ will the Gravel Pit and trucks be any crossing Rosario road for any reason? Would there be any instances where their trucks or traffic would impact our parcels or parcels to the north and south of ours?

2/ on one of the maps there possibly is a jog in the Rosario Road about P 19155 on the zoning map Exhibit2 near the letters RRS-NRL"SITE":
Does this indicate a change of the Rosario Road in that area? If so what the change? Is it an entrance? The spiral appearing line off of Rosario, further south of the jog, is this going to an entrance?

3/ We own land that borders the cliff overlooking Burrows Bay. We know the cliff is sandy and has had many slides. We know the gravel pit has a lot of sand in it as well. In reading the 90 pages I don't feel the runoff or erosion has been discussed in depth or analyzed by an agency that watches over slide areas…like what happened in Oso Washington. Has there been sufficient discussion of the run of water into the sandy soil?

We would appreciate a response to us in these three areas and further communication regarding the progress

Thank you for this opportunity to communicate

Diane Fulton
David & Nancy Fulton

From:	Tim Trohimovich
To:	PDS comments
Subject:	Comments on proposed Comprehensive Plan 2016 Update
Date:	Thursday, April 14, 2016 3:06:52 PM
Attachments:	image001.png image003.png

Dear Sirs and Madams:

Enclosed please find Futurewise's comments on the proposed "Comprehensive Plan 2016 Update" and associated development regulations. The letter includes one of the referenced enclosures. The other referenced enclosures will follow in separate emails.

Thank you for considering our comments.

Tim Trohimovich, AICP
Director of Planning & Law

future wise
816 Second Avenue, Suite 200
Seattle, WA 98104-1530
206 343-0681 Ex 118
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Skagit County Planning Commission
1800 Continental Place
Mount Vernon, Wa. 98273

RECEIVED
APR 14 2016
SKAGIT COUNTY
PDS

April 12, 2016

RE: Skagit County Comprehensive Plan 2016 Update, Transportation Technical Appendix. Clean version

Page 261-262 (pages attached) Goal 8A-7 Freight and Economic Development

Please support added language in bold below to policy 8A-7.3.

policy 8A-7.3 Encourage the enhancement and expansion of freight rail service to and from economic activity centers **with priority given to the return of the Sedro Woolley to Concrete rail service to revitalize east county's economic recovery.**

The return of the rail service will play an important role in the economic recovery of east county's abundant natural resources.

Randy Good Aileen Good

Randy and Aileen Good
35482 SR 20
Sedro Woolley Wa. 98284
360-856-1199

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

Transportation System (FGTS). In conjunction with the state, designate portions of the road system as truck routes.

policy 8A-7.2 Provide roads structurally adequate to handle anticipated commercial traffic demand, particularly on the FGTS.

policy 8A-7.3 Encourage the enhancement and expansion of freight rail service to and from economic activity centers.

policy 8A-7.4 Encourage improvements to air transportation facilities consistent with the ports of Skagit County and the state Aviation System Plan. Improve road and transit linkages to airport facilities.

Goal 8A-8 Tourism and Recreation

Support the promotion of tourism, recreation, and special events through the County transportation system.

policy 8A-8.1 Involve affected jurisdictions in the planning and design of transportation projects that affect major tourism, park, and recreation facilities.

policy 8A-8.2 Coordinate management of the transportation system during special events with the responsible program organizations, while minimizing the disruption of normal economic operations including agriculture, forestry, and other natural resource industries.

policy 8A-8.3 Encourage the state to consider high-season traffic demand on SR 20 in East Skagit County whenever the state studies the need for improvements.

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

policy 8A-6.7 Design all non-motorized facilities in compliance with federal, state and local accessibility standards.

policy 8A-6.8 Access and trailhead facilities should include adequate parking and sanitation.

policy 8A-6.9 Promote non-motorized transportation as a viable, healthy, non-polluting alternative to the single occupancy vehicle.

policy 8A-6.10 **Rail Corridors** - Rail corridors should be preserved through the use of rail banking programs after affected property owners and their property rights are first adequately and legally addressed.

policy 8A-6.11 Community and subarea plans should identify and address the implementation of pedestrian, bicycle and (where appropriate) equestrian facilities that provide safe, efficient and convenient access to residential neighborhoods, schools, parks and recreation facilities, commercial districts, activity centers, tourist areas and established or planned multi-use trails.

policy 8A-6.12 Emphasize maintenance of existing non-motorized facilities, including road sweeping, striping, signing, and debris removal, and the ongoing development of smooth and continuous road shoulders, including asphalt overlays or enhanced chip sealing where appropriate and feasible.

Goal 8A-7 Freight And Economic Development

Support economic development goals by providing adequate air, rail and surface freight handling routes and facilities throughout the County transportation system.

policy 8A-7.1 **Freight and Goods Transport System** – Invest in road improvements to create an All-Weather Road System as part of the Freight and Goods

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PDS

Skagit County Planning Commission April 4, 2016
1800 Continental Place
Mount Vernon, Wa. 98273

RE: Comments on Skagit County Comp Plan Transportation Plan Element 2016 Update - Transportation Technical Appendix,

Transportation Technical Appendix,
Page 57 - Exhibit 26. Transportation Improvement Program Project List.
Pages 58,59,60 -- shows 11 projects listed under Non-Motorized that have not been adopted onto the Skagit County Transportation Improvement Program. These 11 projects have not yet received GMA required public notice and review. Skagit County has a yearly Transportation Improvement Program Project (TIP) public process that must be followed when adding new projects to the Skagit County Transportation Improvement Program. That included a public meeting at Continental Place last year, a public hearing with the county planning commission and a public hearing with the Skagit County Commissioners. **All other county projects on this Exhibit 26 list, have gone through the public process and are already adopted onto the county 6 yr. Transportation Improvement Program and have an ID number.**

There is no record of any public involvement process and no record of the county commissioners ever voting on these 11 projects.

Efforts to include these 11 projects now, bypassing Skagit County's TIP public process already in place to add or delete projects described above raises questions. Public notice and review would be denied and public participation would be denied.

Skagit Council of Governments (SCOG) is the State and Federal source for transportation funding distribution of our gas taxes we pay at the pump.

SCOG has made it clear projects that are being considered for funding are taken from the Skagit County Comp Plan, city and town comp plans. SCOG has also made it clear that it is the duty of the local jurisdictions, county, cities and the towns to provide early and continuous public participation on all projects before being forwarded to SCOG for funding. (Backup documentation attached SCOG Staff Responses)

Public participation is essential in planning projects through to construction.

Projects listed on pages 58,59,60 include: Bicycle Route 5 (Coast Millennium Trail), North Fork Bridge, Bicycle Route 14, McLean Pocket Park, Bayview Ridge Spur, Swinomish Indian Tribal Community Safe Routes, Burlington to Edison Multi Modal Pathway (Tiger Trail), Avon Multimodal Cutoff, Guemes Ferry Trail, US Bicycle Route 13, and US Bicycle Route 10 (Cascade Trail).

Please remove these 11 non-motorized projects from Exhibit 26. These projects must go through the Skagit County's TIP process already in place as held last year. A public meeting at 1800 Continental Place, a hearing with the county planning commission and a hearing with the county commissioners, meeting the requirements of public notice and review and public participation. And as SCOG Staff state, it's up to the local jurisdictions, in this case the county's responsibility to see to it that early, continuous public participation is achieved on all projects to be forwarded to SCOG for funding.

Transportation Technical Appendix,
Implementation Policies- page 70,

C. Public Process & Right-of-Way Acquisition --
Please delete the following language in this paragraph
" whether the acquisition is through eminent domain,".
County government should not use eminent domain for optional non-motorized transportation/recreation projects.

D. Trails on Dikes-
The Skagit County Dike Trail Feasibility Study should not be referenced or included in the Comp Plan Update. Dikes are private property and are not open for public use.

Thank you for considering my comments.

Randy Good
35482 SR 20
Sedro Woolley Wa. 98284 360-856-1199

Backup documentation-
SCOG Staff Responses to Randy Good
From Regional Transportation Plan update.

SCOG
SKAGIT COUNCIL OF GOVERNMENTS
204 W Montgomery • Mount Vernon • WA • 98273 www.scog.net

2016-2021 RTIP PUBLIC COMMENTS

Below is a summary of the public comments received regarding the 2016-2021 Regional Transportation Improvement Program (RTIP) and how they were addressed.

Comments on 2016-2021 Regional Transportation Improvement Program - Randy Good – September 28th, 2015:

Comment	Staff Response
For RTIP Development Process, Federal and State legislation requires "... Early and continuous public participation..." Other Council of Governments within Washington State and all across the country have the following policies listed under Federal and State Regulations when developing their RTIP. (copies attached highlighted) • Provide public meeting(s) to give the public opportunity to pose questions on projects for the RTIP along with a 30 day comment period. Delaware Valley Regional Planning Commission, MPO. (copy attached) • Provide reasonable opportunity for public comments, including a formal public meeting: Benton-Franklin Council of Governments. (copy attached) • Provide reasonable opportunity for public comment, including a formal public meeting and posting the document on-line: Spokane Regional Transportation Council 2016-2019 TIP. (copy attached) • Notice for SRTC TIP meeting to review the TIP, ask questions and provide input, for September 23, 2015 meeting. (copy attached)	Mr. Good identified three Metropolitan Planning Organizations (MPOs) which are also Transportation Management Areas (TMAs). (TMAs are typically designated in urbanized areas with populations of 200,000 or more.) SCOG is not a TMA. TMAs, that are also in Environmental Protection Agency-designated nonattainment areas for air quality standards, have slightly different public participation requirements than other MPOs such as SCOG, as defined in 23 CFR 450.324 (b). For SCOG, public participation for the Transportation Improvement Program is defined in the Public Participation Plan (PPP). The development of the 2016-2021 RTIP was consistent with the SCOG PPP, adopted in May of 2015.
We are supportive of Skagit County Public Works Director Dan Berentson reinstating a public meeting for the county TIP process to address questions and concerns from the public on projects to be included in TIP.	Comment noted.
We encourage SCOG to achieve compliance with Federal and State Regulations and support the following recommendations along with Federal and State Requirements listed above.	SCOG is fully compliant with all applicable federal and state regulations.
Local jurisdictions must supply documentation that each jurisdiction has completed a public participation process before it is accepted by SCOG to be listed on the RTIP for grant funding. The process must include public notice identifying projects proposed to be included on the TIP and a public meeting to answer questions from the public on the projects. This will also allow the public to bring new needed projects forward.	The Transportation Policy Board (TPB) may consider requiring project sponsors to document how the public was engaged for each project proposed to be included in the RTIP.

#	Commenters	Public Comments	SCOG Staff	
			Responses	Suggested Plan Revisions
		undesirable activities is a huge food security and food safety risk for local farmers.		
9	Randy Good, Friends of Skagit County	Projects listed in RTP. 1. Some projects are included in the Regional non-motorized plan which is not a adopted legal plan. 2. The US Bike Route 10 which runs through the county from Anacortes to the Idaho border not even mentioned in this plan. 3 Many of the projects on the wish list of projects for future consideration, have no public notice or public process Some are not on any plan. These projects should be separated from projects that have had full public notice and citizens' review and approval and be removed from the RTP.	Reponses are numbered to correspond with comments as follows: 1. Agreed, the regional non-motorized plan is not a legal, adopted plan. There is no regional non-motorized plan at this time. The planning process to develop such a plan began in 2012, but the plan has not yet been completed. Some projects identified during the planning process are included in Skagit 2040, but only where they are sponsored by SCOG member agencies. If there is no project sponsor, the projects do not appear in Skagit 2040. SCOG staff has been coordinating with staffs from local jurisdictions as they develop their GMA comprehensive plans. After those plans are finalized, later in 2016, SCOG staff will be revisiting Skagit 2040 to harmonize the regional plan with local comprehensive plans if necessary. The timing of overlapping planning processes is far from ideal, as SCOG is working on completing Skagit 2040 while cities, towns and Skagit County are nearing completion of their comprehensive plans. If changes need to be made to the Plan after local comprehensive plans are adopted, these changes will be identified later in 2016 and SCOG staff will propose making minor revisions to the Plan. 2. More of an explanation of U.S. Bike Route 10 should be added to the Plan in narrative form. U.S. Bike Route 10 was noted in the draft Plan under the Other Modes subheading for State Route 20 on Page 41. 3 As noted above, SCOG staff will revisit Skagit 2040 later in 2016 to harmonize the regional plan with local comprehensive plans if necessary There is no "wish list" of projects in Skagit 2040 We do have an "illustrative list" of projects included	Add the following to Page 54: "In 2014, the first U.S. Bicycle Route was designated in Washington state by the American Association of State Highway and Transportation Officials. This route, U.S. Bicycle Route 10, follows State Route 20, including the Spur, from the Anacortes Ferry Terminal to the border of Idaho. Eventually, the route will travel east-west all the way to Maine; one of a number of interstate bicycling routes across the U.S."

 (continued on next page)

#	Commenters	Public Comments	SCOG Staff	
			Responses	Suggested Plan Revisions
			in the non-fiscally-constrained part of the Plan, which we do not anticipate being able to fund given current revenue and expenditure forecasts out to 2040 unless additional sources of funds become available outside of the forecast. SCOG does not assure that projects proposed by member agencies for Skagit 2040 have been vetted through public notice and review. Concerns with project-level public participation should be addressed at the appropriate project-sponsor level.	
10	Randy Good, Friends of Skagit County	The TAC needs to learn what preservation means. As we understand it, "preservation" means activities that repair surfaces or extend the life of a project. We suggest the TAC consider needs over wants and develop criteria to review and rank projects that reflect a score of what projects are needed to maintain or extend the life of Skagit County's transportation infrastructure.	Preservation was one of the six priorities used to evaluate projects in Skagit 2040. The others were: economic vitality; safety; mobility; environment; and stewardship. Projects were not ranked for Skagit 2040, though they were given a relative priority of high, medium or low. Projects are categorized as: • Funded if they already have secured funding; • Planned if they do not yet have secured funding but are expected to be completed during the time frame of the Plan given forecast financial constraints; and • Illustrative if they not expected to be funding during the time frame of the Plan given expected financial constraints. Thank you for your comments.	
11	Dale O'Brien, Skagit Transit	Skagit Transit has reviewed the document and would like to acknowledge the hard work of SCOG staff and the high level of agency coordination needed to update the Regional Transportation Plan.	Comment noted, thank you for working closely with us on developing Skagit 2040.	
12	Dale O'Brien, Skagit Transit	Additionally, Skagit Transit requests that the Transportation Policy Board consider an additional goal/strategy be included under Policy 1. The requested goal or strategy to be	Agreed, add new goal/strategy to Policy 1 in Section 4: Transportation Priorities & Policies to better coordinate public transportation infrastructure with roadway projects. Thank you for your comments.	Add new goal/strategy to Page 33: "1.11 Coordinate road construction projects with Skagit Transit to ensure current and future public

Skagit County Planning Commission
1800 Continental Place
Mount Vernon, Wash. 98273

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APR 14 2016
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April 13, 2016

RE: Comments on Skagit County Comprehensive Plan 2016 Update,

Development Regulations
Pages 33-35: (Pages attached)
C-12 and C-13 NRL Disclosure Mailing and Title Notice

Page 34- #1. This update removes the county requirement to mail notices to all owners of and near natural resource land. County has been failing to comply with this.

Solution to this- Create a landowner email notification using website with map, zoning and parcel numbers. Advertise the map URL on county tax statements, Skagit 21, press releases, county list serves to HOA's and community organizations close to these NRL.

Page 34- #2. Changes the requirement of title disclosure-on-sale for NRL to the buyer instead of seller. The original purpose of this notification was to prevent litigation from NRL activities. Realtors now provide this statement when finalizing a sale. Is recorded and stays with property title.

Recommend having statement recorded on each deed of property, then would not have to refile at each sale and would serve as notice to buyer and seller. Essential notice is attached to deed for buyers review.

C-14 Notification of Development adjacent to NRL land

Page 34-35- #1. Now if an applicant is within 500 feet of natural resource lands requires recording a title notice before applying for a development permit. This causes a delay in permit processing, causes pollution of title record and is redundant with provisions in C-13.

A plan to notice all neighbors electronically or by website active map would benefit all. Currently PD&S staff can sign off on the requirements to obtain neighbors permission by signature.

Enforcement is not the same for all properties. County could provide notice to all neighbors by electronically or by active map that generate letters or emails. Or provide a website that shows active development proposals, parcels and required notification distances from proposed actions.

Thank you for the opportunity to comment.

Randy Good

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reasonable period of time taking into account the nature and scope of the application. For eligible collocation and modification requests, a reasonable period of time is 60 days from the time an complete application is filed. For all other proposals for personal wireless service facilities, a reasonable period of time is 120 days. Any decision to deny such an application shall be in writing and supported by substantial evidence contained in a written record. The review and approval process is defined in Chapter 14.06 SCC, Permit Procedures.

(18) Application ~~Package~~ Requirements for Proposed Personal Wireless Service Facilities, Excluding Eligible Collocation and Modification Requests. A complete application form provided by Planning and Development Services, with supporting documents as required below, that contains sufficient information to determine compliance with adopted rules and regulations as outlined in SCC 14.16.850 shall be submitted. At the discretion of Planning and Development Services, all personal wireless service facilities applicants shall be required to submit any combination of site plans, surveys, maps, technical reports or written narratives necessary to convey the following information:

(a) – (q) *No change.*

(19) *No change.*

(20) Upon approval of a special use permit where necessary, the subsequent complete building permit application will require the following items:

(a) – (c) *No change.*

14.18.000 General

(1) *No change.*

(2) Applicability/Exemptions. This Chapter shall apply to all divisions and redivisions of land for the purposes of sale, lease, or other transfer except:

(a) Cemeteries and other burial plots while used for that purpose;

(b) Divisions of land into lots 80 acres and greater. For purposes of computing the size under this Subsection exemption of any lot that borders on a street or road, the lot size shall be expanded to include that area which would be bounded by the centerline of the road or street and the side lot lines of the lot running perpendicular to such centerline.

(c) Divisions made by testamentary provisions, or the laws of descent; provided, that newly created parcels are subject to all zoning and building code regulations in effect at the time of the filing of a complete development permit application for such parcel.

(d) A division for the purpose of leasing land for facilities providing personal wireless services while used for that purpose.

(e) Any other division exempted by RCW 58.17.040.

Commented [A19]: To conform with requirement that county can only ask for the information necessary to determine if it meets the eligible collocation or modification request.

Commented [A20]: This is to conform to RCW 58.17.040(8). Note there are additional types of land divisions exempted in this section of the RCW. Only addressing the personal wireless services facilities one here because of focus of these proposed amendments.

C-12 and C-13 NRL Disclosure Mailing and Title Notice

SCC 14.38.030 Disclosure.

~~(1) The statement set forth in Subsection (2) of this Section ("disclosure") shall be used under the following circumstances and in the following manner:~~

~~(a) Skagit County shall mail a copy of the disclosure with an explanatory informational attachment to all landowners whose parcel(s) lie within an area or within 500 feet of an area designated as a Natural Resource Land in Skagit County beginning in the year 1990 and every 3 years thereafter; provided that no liability shall attach to Skagit County for any actions or omissions under this Subsection.~~

~~(b)~~(1) Upon transfer of real property by sale, exchange, gift, real estate contract, lease with an option to purchase, any other option to purchase, ground lease coupled with improvements, or any other means, the ~~seller shall be required to~~ buyer must record with the County Auditor a statement containing the language set forth in Subsection (2) of this Section in conjunction with the deed conveying the real property~~, provided, however, that~~ when the real property is located within 1 mile of the Agriculture Natural Resource Land (Ag-NRL), or 1/4 mile of Industrial Forest Natural Resource Land (IF-NRL), Secondary Forest Natural Resource Land (SF-NRL), or Rural Resource Natural Resource Land (RRc-NRL), or Mineral Resource Overlay (MRO-NRL) districts, as set forth in SCC 14.16.400, 14.16.410, 14.16.420, 14.16.430, and 14.16.440, respectively.

(2) The following shall constitute the disclosure required by this Section:

This ~~disclosure applies to parcels~~property may be designated or may be within 1 mile of designated agricultural land or designated or within 1/4 mile of rural resource, forest or mineral resource lands of long-term commercial significance in Skagit County. A variety of Natural Resource Land commercial activities occur or may occur in the area that may not be compatible with non-resource uses and may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals; or from spraying, pruning, harvesting or mineral extraction with associated activities, which occasionally generates traffic, dust, smoke, noise, and odor. Skagit County has established natural resource management operations as a priority use on designated Natural Resource Lands, and area residents should be prepared to accept such incompatibilities, inconveniences or discomfort from normal, necessary Natural Resource Land operations when performed in compliance with Best Management Practices and local, State, and Federal law.

In the case of mineral lands, application might be made for mining-related activities including extraction, washing, crushing, stockpiling, blasting, transporting and recycling of minerals. If you are adjacent to designated NR Lands, you will have setback requirements from designated NR Lands.

C-14 Notification of Development adjacent to NRL land

14.16.870 Notification of development activities on or adjacent to designated natural resource lands.

(1) Title Notification. The owner of any site in or within 500 feet of Natural Resources Lands, for which an application for a development permit is submitted ~~as defined in Chapter 14.04 SCC shall record a title notification with the Skagit County Auditor. The content and form must be approved by the Administrative Official and the Prosecuting Attorney. The notice shall be notarized and shall be recorded prior to approval of any development proposal for the site, and include the following language~~must sign a statement that includes the following language:

This parcel lies within an area or is within 500 feet of an area designated as a natural resource land (agricultural, forest, and mineral resource lands of long-term commercial significance) in Skagit County. A variety of natural resource land commercial activities occur or may occur in the area that may not be compatible with non-resource uses and may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals; or from spraying, pruning, harvesting, or mineral extraction with associated activities, which occasionally generates traffic, dust, smoke, noise, and odor. Skagit County has established natural resource management operations as a priority use on designated natural resource lands, and area residents should be prepared to accept such incompatibilities, inconveniences, or discomfort from normal, necessary natural resource land operations when performed in compliance with best management practices and local, State, and Federal law. In the case of mineral lands, application might be made for mining-related activities including extraction, washing, crushing, stockpiling, blasting, transporting, and recycling of minerals. In addition, greater setbacks than typical may be required from the resource area, consistent with SCC 14.16.810. Contact Skagit County Planning and Development Services for details.

C-15 Cleanup: MRO

14.16.430 Rural Resource—Natural Resource Lands (RRc-NRL).

(1) *No change.*

(2) *No change.*

(3) *No change.*

(4) Hearing Examiner Special Uses.

(a) – (f) *No change.*

(g) If located within a designated mineral resource overlay, extracting and processing mineral resources pursuant to SCC 14.18.840, Mineral Resource Overlay.

(h) – (t) *No change.*

(5) *No change.*

(6) *No change.*

C-16 Fueling Stations [see S-3]

This item is addressed in item S-3.

C-17 Temporary Events in Commercial and Industrial

14.16.195 Urban Reserve Commercial-Industrial (URC-I).

(1) Purpose. *No change.*

From: Gary Hagland
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Thursday, April 14, 2016 3:09:07 PM

Examining 452 pages of a draft document with its suggested changes is no small task, especially as the document was only made public on March 4th. In addition, besides the proposed draft, there's a confusing array of appendixes and other supporting documents that one also has to negotiate. Regardless, while skimming through there were several items that caught my attention and which I'd like to address.

Public Involvement: This is a Washington State requirement for policy, legislation and projects being considered at the primary jurisdictional level, whether town, city or county. Public involvement is sought from the beginning and throughout the process. However, that requirement is sometimes overlooked as in the case of 11 non-motorized projects mysteriously added to the Transportation Improvement Program (Transportation Element Technical Appendix, Exhibit 26, pp. 58-60)

Or the nature of public involvement and disposition of the matter in question may be misrepresented as are references to Envision Skagit 2060 (track changes draft, p.17 and pp. 22-24)

The entire effort, from "Alternative Futures" to the relabeled project as "Envision Skagit 2060" was tightly controlled by staff, from the visioning workshops to the choosing of consultants hired to provide technical advice to the carefully chosen Citizens Advisory Committee that created the finished product. The project was supposed to be organic, but closely resembled any number of "visioning" plans from across the country.

The true public involvement were the scores of people who showed at hearings conducted by the Skagit Council of Governments to voice their opposition to Envision Skagit 2060's social engineering goals of downsized living arrangements and regressive public transportation alternatives (e.g. third world "colectivos," river and rail passenger service) as well as excessive emphasis on "green" infrastructure and a tepid and inept economic analysis. In addition, the committee's recommendation to form a countywide decision making body that included private (and thus non-elected) individuals as well as public officials demonstrated lack of concern, if not outright contempt, for democratic process.

Please remove references to ES2060 from the Comp Plan as it was never adopted by the requisite parties within in the county and thus does not have any legitimacy.

Eminent Domain: Under "Skagit County Non-Motorized Transportation Plan Specific Policies," in the Transportation Element Technical Appendix, there is a reference to the acquisition of land for transportation purposes, and in this case for non-motorized transportation purposes, by eminent domain. (Para C., p 70). Since non-motorized transportation in this county as it is across this country is overwhelmingly recreational in nature, to confiscate someone's property without just compensation for someone else's recreational enjoyment is unconscionable. Please delete the "eminent domain" reference.

Trails on Dikes: Although the policy statement requires Planning & Development Services to consult and obtain the approval of the land owner and dike district for any proposed trail to be located on a dike (Para D. pp 70-71), allowing public access to those properties will undoubtedly be problematic for security, safety, and possibly erosion with heavy use. There's a significant element among the population that has no concern for any property but its own. Recommend that this item be stricken from the draft.

Affordable Housing: (pp 229 ~) Skagit County and the individual communities within its boundaries have already opted for restrictive land use regulations as to where and what type of housing can be built. These regulations require most construction to occur in strictly delineated urban growth areas (UGA) while comparatively few new residential structures are allowed outside. Following the law of supply and demand, buildable property then becomes more valuable due to scarcity and costs rise accordingly. Housing becomes unaffordable for low and many middle income individuals and families. Thus, the problem of affordable housing is one of the county's and the various communities' own making.

More dramatic examples of this include the heavily regulated, large metropolitan areas of Seattle, Portland and San Francisco where many lower income people have been forced to migrate well outside those cities because of extremely high home ownership and rental prices.

"Densification" within UGA's is considered a remedy for lack of housing, however, it remains to be seen if it really is as prices will probably remain high and unaffordable for many unless some form of subsidization is employed.

Although apparently not favored by the majority of county residents, the alternative is loosening land use regulations somewhat outside the UGA's to increase land available for construction. It is my understanding that more resource lands within Skagit County have been lost to conservation easements and habitat restoration projects than to housing development.

Have attached an article by Joel Kotkin, "This is Why You Can't Afford a House," which explains the current housing situation very well. His analysis and suggestions are worth consideration.

Freight and Economic Development: Personally, I believe that improving the county's economic well being, especially in the eastern part, should be given higher priority than some of the other goals listed in the proposed draft comp plan.

It is my understanding that there is interest in reestablishing an east-west rail line between Concrete and Sedro-Woolley. It is also my understanding that, by law, the current Cascade Trail would revert back to a rail line, which could be accomplished fairly quickly as the route is already in place. That is why I think reestablishing rail service between the two communities should be given highest priority. The final version of the Comp Plan should state that (Goal 8-A-7).

Sincerely,

Gary Hagland
Skagit CAPR Chapter, President
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Anacortes, WA 98221

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(360) 202-3750 (C)

JOEL KOTKIN

02.07.16 9:01 PM ET

This Is Why You Can't Afford a House

http://www.thedailybeast.com/articles/2016/02/08/this-is-why-you-can-t-afford-a-house.html

The rising cost of housing is one of the greatest burdens on the American middle class. So why hasn't it become a key issue in the presidential primaries?

There's little argument that inequality, and the depressed prospects for the middle class, will be a dominant issue this year's election. Yet the most powerful force shaping this reality—the rising cost of housing—has barely emerged as political issue.

As demonstrated in a recent report (PDF) from Chapman University's Center for Demographics and Policy, housing now takes the largest share of family costs, while expenditures on food, apparel, and transportation have dropped or stayed about the same. In 2015, the rise in housing costs essentially swallowed savings gains made elsewhere, notably, savings on the cost of energy. The real estate consultancy Zillowpredicts housing inflation will only worsen this year.

Driven in part by potential buyers being forced into the apartment market, rents have risen to a point that they now compose the largest share of income in modern U.S. history. Since 1990, renters' income has been stagnant, while inflation-adjusted rents have soared 14.7 percent. Given the large shortfall in housing production—down not only since the 2007 recession but also by almost a quarter between 2011 and 2015—the trend toward ever higher prices and greater levels of unaffordability seems all but inevitable.

The connection between growing inequality and rising property prices is fairly direct. Thomas Piketty, the French economist, recently described the extent to which inequality

in 20 nations has ramped up in recent decades, erasing the hard-earned progress of previous years in the earlier part of the 20th century. After examining Piketty's groundbreaking research, Matthew Rognlie of MIT concluded (PDF) that much of the observed inequality is from redistribution of housing wealth away from the middle class. Rognlie concluded that much of this was due to land regulation, and suggested the need to expand the housing supply and reexamine the land-use regulation that he associates with the loss of middle-class wealth. Yet in much of the country, housing has become so expensive as to cap upward mobility, forcing many people to give up on buying a house and driving many—particularly young families—to leave high-priced coastal regions for less expensive, usually less regulated markets in the country's interior.

The Rise of the Exclusionary Region

The regions with the deepest declines in housing affordability, notes William Fischel, an economist at Dartmouth College, tend to employ stringent land-use regulations, a notion recently seconded by Jason Furman, chairman of President Obama's Council of Economic Advisors. In 1970, for example, housing costs adjusted for income were similar in coastal California and the rest of the country. Today house prices in places like San Francisco and Los Angeles are three or more times higher, when adjusted for income, than most other metropolitan areas. For most new buyers, such areas are becoming what Fischel calls "exclusionary regions" for all but the most well-heeled new buyers.

The biggest impact from regulation has been to diminish the supply of housing, particularly single-family homes. In a recent examination of permits across the nation from 2011 to 2014 for *Forbes*, we found that California regions lag well behind the national average in terms of new housing production, both multi-family and single family. Houston and Dallas-Fort Worth, areas with less draconian regulations, have issued three times as many permits per capita last year. Overall California's rate of new permits is 2.2 per 1000 while across the Lone Star state the rate was nearly three times higher.

In the “exclusionary regions” along both coasts, high land prices have made it all but impossible to build much of anything except luxury units. In Manhattan this has taken the form of high-rise towers that have been gobbled by the rich, including many foreigners, but this new construction has done little to make New York affordable for most residents. Between 2010 and 2015, Gotham rents increased 50 percent, while incomes for renters between ages 25 and 44 grew by just 8 percent.

Real estate inflation is redefining American politics and could eventually transform the nature of our society. In the dense, increasingly “kiddie-free zones” around our Central Business Districts (CBDs), according to 2011 Census figures, children between ages 5 and 14 constituted about 7 percent of the population, less than half the level seen in newer suburbs and exurbs. The common habitués of these high-cost, high-density urban areas—singles and childless couples—have emerged, according to Democratic pollster Stan Greenberg, as key elements of the progressive coalition.

The bluer the city, generally, the fewer the children. For example, the highest percentage of U.S. women over age 40 without children—a remarkable 70 percent—can be found in Washington, D.C. In Manhattan, singles make up half of all households. In some central neighborhoods of major metropolitan areas such as New York, San Francisco, and Seattle, less than 10 percent of the population is made up of children under 18. Perhaps the ultimate primary example of the new child-free city is San Francisco, home now to 80,000 more dogs than children, and where the percentage of children has dropped 40 percent since 1970.

In contrast, familial America clusters largely in newer suburbs and exurbs, and increasingly in the lower-cost cities in the South, the Intermountain West, and especially in Texas. Overall—and contrary to the bold predictions of many urbanists—suburban areas are once again, after a brief slowdown, growing faster than the urban cores. America remains a suburban nation. Overall, 44 million Americans live in the core cities of America’s 51 major metropolitan areas, while nearly 122 million Americans live in the suburbs. And this does not include the more than half of the core city population that live

in districts, particularly in the Sunbelt, that are functionally suburban or exurban, with low density and high automobile use.

Inequality may be a big issue among urban pundits, but, ironically, inequality is consistently more pronounced in larger, denser cities, including New York, Los Angeles, and San Francisco. Manhattan, the densest and most influential urban environment in North America, exhibits the most profound level of inequality and the most bifurcated class structure in the U.S. If it were a country, New York City overall would have the 15th-highest inequality level of 134 countries, according to James Parrottof the Fiscal Policy Institute, landing between Chile and Honduras.

In our core cities in particular, we are seeing something reminiscent of the Victorian era, when a huge proportion of workers labored in the servile class. Social historian Pamela Cox has explained that in 1901 one in four people, mostly women, were domestic servants. But is this—the world portrayed in shows such as *Downton Abbey* and *Upstairs Downstairs*—the social norm we wish most to promote?

In contrast, research by the University of Washington's Richard Morrill shows that suburban areas tend to have "generally less inequality" than the denser areas. For example, in California, Riverside-San Bernardino is far less unequal than Los Angeles, and Sacramento less so than San Francisco. Within the 51 metropolitan areas with more than 1 million in population, notes demographer Wendell Cox, suburban areas were less unequal (measured by the Gini coefficient) than the core cities in 46 cases. And overall the poverty rate for cities is close to 20 percent, almost twice that of suburban areas.

The differential of housing cost accounts for much of this disparity. High housing prices tend to stunt upward mobility, particularly for minorities. One reason: The house remainsthe last great asset of the middle class. Homes represent only 9.4 percent of the wealth of the top 1 percent, but 30 percent for those in the upper 20 percent and, for the 60 percent of the population in the middle, roughly 60 percent. The decline in property ownership threatens to turn much of the middle class into a class of rental serfs, effectively wiping out the social gains of the past half-century.

The Geographic Shift

High housing prices are also rapidly remaking America's regional geography. Even areas with strong economies but ultra-high prices are not attracting new domestic migrants. One reason is soaring rents: According to Zillow, for workers between 22 and 34, rent costs claim upwards of 45 percent of income in Los Angeles, San Francisco, New York, and Miami compared to less than 30 percent of income in cities like Dallas and Houston. Thecosts of purchasing a house are even more lopsided: In Los Angeles and the Bay Area, a monthly mortgage takes, on average, close to 40 percent of income, compared to 15 percent nationally.

This is leading to a renewed shift even among educated millennials to such lower-cost regions as Atlanta, Orlando, New Orleans, Houston, Dallas-Fort Worth, Pittsburgh, Columbus, and even Cleveland. As millennials enter their 30s and seek to buy houses, these changes are likely to accelerate.

Millennials may be staying in the city longer than previous generations, but their long-term aspirations remain fixed on buying a single-family house. This trend will accelerate in the next few years, suggests economist Jed Kolko, as the peak of the millennial population turns 30. Faced with a huge student debt load, a weaker job market, and often high housing prices, millennials face tougher challenges than some previous generations, but retain remarkably similar aspirations.

Bringing Back Levittown

Clearly America needs a new approach to housing. Democrats may enjoy their strongest base in the cities, but many of their young constituents likely will end up in the suburbs, or will continue to move to smaller, less reflexively progressive cities. Finding ways to make suburbs more sustainable, both environmentally and for families, will have more long-term appeal than trying to eliminate their preferred way of life.

Some attempts to force developers to build low-income units have, if anything, worsened the situation by discouraging new production while actually boosting prices for the vast majority. In some cases, as in New York City, the forced construction of low-income

units in otherwise market-rate buildings has resulted in such absurdities as the so-called "poor door," through which low-income residents, who are denied most of the amenities offered to wealthier residents, must enter.

Republicans too may need to change their tune. As suburbs become more multi-cultural, and dominated by millennials, the GOP will have to embrace some of the environmental and social priorities of the new residents. They also have to realize that middle-class homeowners do not always share the same interests as Wall Street investors. Under the current regulatory regime, slavish adherence to the ambitions of big investors could undermine the dispersed ownership culture, replacing it with one primarily rental-based, even in single-family homes. Essentially this could transform large areas, including suburbs, into far less socially stable areas, particularly for families.

One potential solution would be to draw on the successful policies enacted after World War II. At that time, the nation suffered a severe housing crisis as servicemen returned from the war. The solution combined governmental activism—through such things as the GI Bill and mortgage interest deductions—with less regulatory control over development. The result was a massive expansion of the country's housing stock, and a dramatic increase in the level of homeownership.

Bringing back the Levittown approach would require jettisoning ideological baggage that now accompanies the contemporary discussion about housing. Libertarians tend to favor loosened regulations—something welcome indeed—but seem to have less than passionate interest in addressing the housing interests of working- and middle-class Americans. As we saw in the late '40s, at least *some* government support for affordable housing is critical to expanding ownership.

But increasingly the worst influence on housing stems from the proclivities of contemporary progressivism. Whereas earlier Democratic presidents, from Roosevelt and Truman to Johnson and Clinton, strongly supported suburban single-family growth, contemporary progressives display an almost cultish bias toward the very dense, urban

environment. The fact that perhaps at most 10 to 20 percent of Americans prefer this option almost guarantees that this approach would be unacceptable to the vast majority. How we deal with the housing crisis will shape our future, and will largely determine what kind of nation we will become. Although some developers outside the coastal areas are trying to revive smaller "starter homes," at least in more reasonably priced markets, this may prove all but impossible to accomplish in "exclusionary regions" unless there is serious change.

Following our current path, we can expect our society—particularly in deep blue states—to move ever more toward a kind of feudalism where only a few own property while everyone else devolves into rent serfs. The middle class will have little chance to acquire any assets for their retirement and increasingly few will choose to have children. Imagine, then, a high-tech Middle Ages with vast chasms between the upper classes and the poor, with growing dependence—even among what once would have been middle-class households—on handouts to pay rent. Imagine too, over time, Japanese-style depopulation and an ever more rapidly aging society.

Yet none of this is necessary. This is not a small country with limited land and meager prospects. A bold new approach to housing, including the reform of out of control regulations, could restore the fading American dream for tens of millions of families. It would provide the basis for a greater spread of assets and perhaps a less divided—and less angry—country. Rather than waste their time on symbolic issues or serving their financial overlords, candidates in both parties need to address policies that are now undermining the very basis of middle-class democracy.

Joel Kotkin is Presidential Fellow in Urban Futures at Chapman University in California and executive director of the Houston-based Center for Opportunity Urbanism. His next book, The Human City: Urbanism for the Rest of Us*, will be published by Agate in April.*

From: Jeroldine Hallberg
To: PDS comments
Subject: 2016 Comp Plan Update
Date: Thursday, April 14, 2016 4:27:39 PM

Josh Axthelm, Chair, Planning Commission
Planning Commissioners
Dale Pernula, Director, Planning & Development Services
County Commissioners

RE: 2016 Comprehensive Plan Update

Following are my comments regarding the proposed 2016 update to the Comprehensive Plan:

There is strong support in Skagit County for facilities that make it safe to walk, hike, ride bicycles and horses - all those means of transportation categorized as "non-motorized transportation."
That support may not be reflected in regular attendees at Planning Commission meetings, nor is it well reflected in the public discourse. Nevertheless, I have heard many individuals share their support in private conversations. In addition, surveys of what people desire in their public parks and open spaces show there is strong support for trails.

The update proposal, specifically the policies highlighted in yellow, are positive steps toward the goal of having safe places for non-motorized use.

- *Policy 2A-6.2 Adopt plans, policies, codes and development standards that promote public health by increasing opportunities for residents to be more physically active. Such actions include: concentrating growth into Urban Growth Areas, promoting more compact urban development, allowing mixed-use developments, and adding pedestrian and non-motorized linkages where appropriate.*

- *Policy 2A-6.3 Concentrate facilities and services within Urban Growth Areas, using urban design principles, to make them desirable places to live, work, and play; increase the opportunities for walking and biking within the community; use existing infrastructure capacity more efficiently; and reduce the long-term costs of infrastructure maintenance.*

I would like to challenge you to take these policies a step further. There is a logical connection among several county goals that could be advanced by one implementation measure - a countywide bond for open space, including provisions for cities to compete for open space funding with bonuses for locating trails and open space in conjunction with affordable housing.
The goals this would advance are, in addition to those above:

- Concentrate growth in the Urban Growth Areas
- Provide open spaces in and near the Urban Growth Areas
- Increase affordable housing

Cities are reluctant to increase residential densities to levels that make affordable housing affordable (as Mr. Axthelm commented, to grow "up," not "out"). It is costly to provide the infrastructure that makes such housing attractive and livable. Consequently we have seen many examples where cities have reduced their residential densities.

Skagit County could play a leadership role to assist the cities compete for quality developers of attractive affordable neighborhoods. This will require courage to step into an unfamiliar role. However, there are existing organizations who would be willing to help promote an open space bond.

I urge you to take up this challenge.

Sincerely,
Jeroldine Hallberg
6335 State Route 9
Sedro-Woolley, WA 98284

From: Kit Harma
To: PDS comments
Subject: FW: Comprehensive Plan 2016 Update
Date: Thursday, March 31, 2016 8:18:59 PM

Thank you for the opportunity to submit my comments via email while I am away from my Guemes Island Home.

I am very familiar familiar with the Guemes Island Sub-Area Plan (The Guemes Plan) and I have read the letter sent by the Guemes Island Planning Advisory Committee (GIPAC) to Skagit PDS on March 15, 2016 referencing Guemes Island specific shoreline issues in particular and the updates of the Skagit Shoreline Master Plan and Comprehensive Plans as well.

I am writing to express my support for GIPAC's recommendations including both their proposed shoreline map designations and proposed shoreline regulations.

This summer will mark the tenth anniversary the American Institute of Architects' Sustainable Communities Design Workshop on Guemes Island. I was lucky enough to be drawn into this event and to experience the passion and intelligence the Guemes Community contributed towards building a shared vision of what the island should be for generations to come. You can visit the island today and see landmarks and encounter community groups that came from that workshop. Completion of the Guemes Plan was energized by the spirit of this event.

The passing of ten years has not changed the desire of the Guemes community to have their shoreline and aquifer protected. Now is the time to make the shoreline, zoning and code changes to fulfill the promise to the island that came with the adoption of the Guemes Island Sub-Area Plan.

Kit Harma
7393 Holiday Blvd.
Anacortes, WA 98221

This email has been sent from a virus-free computer protected by Avast.
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From:	Dyvon Havens
To:	PDS comments
Subject:	Skagit County 2016 Comprehensive Plan Update
Date:	Monday, April 04, 2016 10:50:25 AM

Comments on Comprehensive Plan Update:

I support the recommendations of the Guemes Island Planning and Advisory Committee to incorporate recommendations from the Guemes Island Subarea Plan into the county code. This will help to protect Guemes water supply and prevent further failure of wells. It will also help protect island shorelines, habitat, and other critical areas, as well as the rural character of Guemes Island.

Dyvon Marie Havens
4709 South Shore Drive
Anacortes, WA 98221

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From: John Highet
To: PDS comments
Subject: Chamberlain Parcel#P48536
Date: Tuesday, March 22, 2016 12:13:02 PM

Hello -

I feel any new business in Edison should be required to meet all current commercial codes and participate in the local sewage assessment and water association.

As a business owner here in Edison I have heard that this project will be allowed to have it's own septic system. I thought the sewage/gray water system was installed to stop leaching into the local slough. If they are allowed to have a private system I don't see how this is fair to the town or helps the leaaching problem.

I pay the highest amount to the County for my septic tank discharge and I feel any new establishment should have to follow every condition that I do to be allowed to operate. I don't think this is happening for this new project and possibly for the most recent restaurant that opened in town.

The added taxation to these type of properties would help to lower mine and all other land owners in the town.

Can you please send me the septic/sewage information that has been approved for this project?

Thank you,

John Highet

From:	Brad Johnson
To:	PDS comments
Cc:	Bryan W. Harrison; Kim Ohara
Subject:	Comprehensive Plan 2016 Update
Date:	Tuesday, April 05, 2016 4:01:05 PM

To: Skagit County
Planning and Development Services
1800 Continental Place, Mount Vernon, WA 98273

From: Brad Johnson, Senior Planner
City of Burlington, Planning Department
833 S. Spruce Street
Burlington, WA 98233

RE: Comprehensive Plan 2016 Update – Comments on Update and SEPA

Planning and Development Services:

Thank you for the opportunity to comment on the County's Comprehensive Plan update. The City of Burlington has reviewed the SEPA Threshold Determination issued by Skagit County on March 3, 2016. The City has also reviewed the SEPA checklist and other documents associated with the Comprehensive Plan update posted on the County's website and we would like to offer the following comments.

With respect to the City of Burlington's Urban Growth Area (UGA), both the SEPA checklist and staff report posted on the County's website indicate the proposed UGA expansion *may* include both the properties owned by the Skagit Housing Authority *and* two adjoining parcels (the Sager and Rohweder parcels). The City respectfully requests that Skagit County revise these documents to clearly state that only the Housing Authority properties will be included in the UGA expansion.

While the City supports the County's efforts to address the preexisting sewer and infrastructure problems at the Housing Authority's Raspberry Ridge development by expanding the UGA to include the Housing Authority's property, and while it may be appropriate to include the Sager and Rohweder parcels in a future UGA expansion, the City does not support their inclusion at this time for the following reasons:

- It has not been shown that any additional land is necessary to accommodate the City's projected population and employment growth. Pursuant to the Growth Management Act (GMA), UGAs may not include more land than is necessary to accommodate twenty years of population and employment growth. While the Housing Authority

parcels are already characterized by, or committed to, urban development, the Sager and Rohweder properties are undeveloped. The City is concerned their inclusion in the proposed UGA expansion may be contrary to GMA requirements.

- The County's Comprehensive Plan currently identifies the Sager and Rohweder parcels as agricultural and natural resource lands (Ag-NRL), a designation established under the requirements of RCW 36.70A.170. Before the current Comprehensive Plan designation can be removed, and the parcels included in the City's UGA, it is necessary to first demonstrate they longer meet the criteria for designation as agricultural lands of long term commercial significance. No such analysis has been provided.

- The staff report prepared in support of the proposed UGA amendments notes that the Sager and Rohweder parcels were included to "form a logical boundary". While the GMA does reference forming a logical outer boundary with respect to limited areas of more intensive rural development (LAMIRDs), the City is unaware of any provisions in the GMA that would allow for the inclusion of additional land within a UGA that cannot otherwise be shown to meet the City's twenty year land supply requirement.

- The City has not considered the Sager and Rohweder parcels in its Comprehensive Plan update efforts and is not prepared to provide these parcels with urban services.

- Both the Sager and Rohweder parcels are within the 100 year floodplain of the Skagit River. The GMA strongly discourages the expansion of UGAs into flood plains (RCW 36.70A.110(8)).

In summary, we are concerned the inclusion of the Sager and Rohweder parcels in the City's UGA may be inconsistent with GMA requirements and is unwarranted at this time. Accordingly, we ask that the maps and documents associated with the proposed UGA expansion be amended to clearly indicate that only the parcels owned by the Skagit Housing Authority will be included in the UGA expansion.

The City appreciates the County's recent work to proactively address the challenges posed by the Skagit Housing Authority's development at Raspberry Ridge and we look forward to working with you as the County moves forward with its Comprehensive Plan update process.

Thank you,

Brad Johnson
Senior Planner
City of Burlington
360-755-9717 (7201)

bradmj@burlingtonwa.gov

From:	Kayla R. Schott-Bresler
To:	PDS comments
Cc:	Jennifer Johnson; Bob Hicks
Subject:	Comprehensive Plan 2016 Update
Date:	Monday, April 04, 2016 3:47:11 PM

On behalf of Jennifer Johnson, Director, Skagit County Public Health, please accept the below comment on the Comprehensive Plan 2016 Update. A signed original will be delivered to the Planning Department via interoffice mail.

Jennifer Johnson, Director
Skagit County Public Health
700 S. 2nd Street, Suite 301
Mount Venon, WA 98273

April 1, 2015

Skagit County Planning Commission
c/o Dale Pernula, AICP, Director
Skagit County Planning & Development Services
1800 Continental Place
Mount Vernon, WA 98273

Re: Comprehensive Plan 2016 Update

Dear Planning Commissioners,

Thank you for this opportunity to comment on the 2016 Comprehensive Plan Update. The Public Health Department greatly appreciates all the tremendous work that you and the planning staff have undertaken to complete the recently released draft.

The Public Health Department administrates county-funded and federally-funded housing programs through contracted non-profit housing agencies. Additionally, we are focused on community collaborations that promote and develop affordable housing. Relative to these initiatives, I wish to submit a comment on the Housing Element of the 2016 Comprehensive Plan. I suggest a minor edit to Policy 7B-1.8 in order to strengthen the County's housing affordability planning efforts.

As you are well aware, Skagit County has critical housing affordability needs. Clearly, the local housing system has not produced a supply of homes that matches the wages and incomes of the people who live and work here. The scale of the problem is staggering. In Skagit County today nearly 17,000 households are "cost-burdened" meaning they cannot afford the homes they rent or own. Over 3,000 of these households are both extremely-low-income and spending more than half of their income on housing, putting them at serious risk of homelessness. A rental vacancy rate below 1% stresses our housing system and makes it difficult for low-income residents to compete for extremely limited housing.

The draft Housing Element identifies a number of important goals, policies, and strategies for tackling this problem, and we applaud these provisions. By adding more detail to Policy 7B-1.8, the County can better measure progress toward meeting the housing needs of all economic segments of our community.

Please consider adding the following additional language to the current draft version:

Policy 7B-1.8 states, *"Develop growth strategies and housing and human service programs to plan for affordable housing within the regional context. In collaboration with the cities and housing providers, address the countywide need for ownership and rental housing affordable to households with moderate, low, and very-low incomes. Work towards a common goal of having 40 percent of the countywide housing stock affordable at or below 80 percent of the area median income (AMI), with an intentional focus on expanding the supply of housing affordable at or below 50 percent AMI. Develop objectives for housing affordable to different income ranges and special needs populations."*

The additional requested emphasis on 50% AMI and below reflects the fact that the County is far from meeting the housing affordability needs of its lowest income residents. The vast majority of homes in Skagit County are priced at levels unaffordable to households earning less than 50% AMI. Currently, only 3% of homes in the County are affordable for extremely low-income people (below 30% AMI), although they represent 12% of the population.

We believe the added policy language draws greater attention to the County's most significant housing needs.

I am encouraged by the community response to the housing affordability and homelessness challenges we are facing. Please do not hesitate to contact me with any questions at (360) 416-1503 or jenniferj@co.skagit.wa.us. Thank you for considering this comment and for all your hard work on behalf of Skagit County.

Sincerely,

Jennifer Johnson

SKAGIT COUNTY AGRICULTURAL ADVISORY BOARD
1800 Continental Place
Mount Vernon, WA 98273
Phone (360) 416-1338

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SKAGIT COUNTY
PDS

April 13, 2016

Comments on proposed "Comprehensive Plan 2016 Update"
Planning & Development Services
1800 Continental Place
Mount Vernon, WA 98273

RE: Comprehensive Plan 2016 Update

The Agricultural Advisory Board is commenting on three comprehensive plan policy amendments.

1. We recommend against striking 3C-5.5 which states:

   "Skagit County should designate an area (or areas) in which to concentrate agriculture industrial related uses and agricultural support services in an "agricultural industrial park." This would allow for these services and their impacts to be concentrated, rather than dispersed throughout the rural area. Designation of an agricultural industrial park is the only instance where Ag-Nrl land converted to a NRI designation, and only based on finding that the agricultural sector is better served by having the land in NRI designation to permit an agricultural industrial park.

   Keeping this policy in the Comprehensive Plan allows for the possibility of an "ag industrial park." No one knows what Skagit County's agriculture future will look like. Someday it may be beneficial to the ag economy to have an ag industrial park in the current Ag-NRI zone providing ag services and showing Skagit County's agriculture.

2. We agree adding policy 3C-11.5, "Uses that support natural resource industries should not be subject to the expansion limitations." Ag support services are an important part of the agricultural economy. These businesses must be allowed to grow and expand to accommodate the changing needs of farmers into the future. Limiting their size may cause them to close and no longer provide essential agri-business services.

3. We do not support changing policy 3C-10.7 concerning Home Base Business 3 in the Ag-Nrl zone. Current code allows for a HBB3 under a Hearing Examiner Special Use "provided the use is accessory to an actively managed, ongoing agricultural operation and no conversion of ag land is required to accommodate the business activity." The proposed policy change would allow Home Based Business 3 to operate in the Ag-Nrl zone without being an accessory to an ongoing ag operation. Also, allowing small businesses without a defined number of employees to operate in the Ag-Nrl will have a negative effect on neighboring ongoing ag operations.

Thank you for taking the time to consider our comments.

Sincerely,

Nels Lagerlund

Nels Lagerlund, Chair
Skagit Agriculture Advisory Board

Skagit County Agricultural Advisory Board Members:
Nels Lagerlund (Chair), Kraig Knutzen (Vice Chair), Murray Benjamin, Steve Bertelsen, Jim Carstens, Barbara Cleave, Scott Hanseth, Michael Hughes, Sloan Johnson, Greg Lee, Steve Omdal, Terry Sapp

From: Hal & Hella Lee
To: PDS comments
Subject: Comprehensive Plan 2016 update
Date: Wednesday, April 13, 2016 8:28:43 PM

I am submitting comments on the Transportation Element of the Skagit County Comprehensive Plan 2016 update.

Overall the Transportation element looks good in that it addresses the diverse needs of bicycle and pedestrian users of the transportation system. However the plan doesn't set benchmarks for implementation of the measures addressed:

- Public education on sharing the road on appropriate routing and utilization of single use and shared use facilities.
- Appropriate signage and road markings.
- Use of advanced chip sealing to provide a smoother surface for bicycles.
- Asphalt overlays designed to include bike lanes or signage for road sharing.

I suggest that a task force be formed to develop a master bicycle and pedestrian plan for Skagit County.

Personally I bicycle ~ 1500 miles a year in Skagit County, both doing errands and for recreation. Prior to retiring a few years ago I biked from Mount Vernon to the Skagit Regional Airport Industrial Park most of the year, putting on several thousand miles a year. For the most part I found a safe route, and it was far better than my commuting by bike when I lived and worked on Bainbridge Island in the 80's and early 90's. That being said, improvements should be made to make non motorized transportation safer and more enjoyable. The advantage is a cleaner healthier environment potentially drawing visitors to the County that spend money at restaurants, lodging, etc.

Thank You,

Harold Lee
2500 S. 18th St
Mount Vernon, WA 98274

Issue Paper – Comp Plan 2016 Update

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New Section 14.16.360 Guemes Island Overlay – Indian Village

Executive Summary: The Indian Village Community is a beautiful community with outstanding views and water access. It has about 21 lots in a flat beach area. About 18 of those lots are only 50 feet in width. About half the homes meet current codes requiring floor elevations 3 to 5 feet above the ground line. The remaining beach homes are vulnerable to flooding. Twelve foot sidewalls will not allow full height ceilings above the floor height if the lower homes are reconstructed to current standards.

The proposed new Section 14.16.360 will take away good design standards and make small homes smaller when they are reconstructed on their narrow lots. Side gables will be eliminated allowing sloping roofs with overhang in the front. Second level rooms will be limited to 14-feet outside dimensions centered in the home. Load bearing walls on the first level will eliminate open concepts with great rooms. Roof heights will be limited below the new proposed 30-feet limiting roof slopes in a high wind area.

The new proposal increases scale differential in the Indian Village Community and reduces rooms with views in new construction. Property values will dive as potential buyers must choose between owning a home with potential flooding or reconstructing a smaller home even more out of scale from neighboring homes. The changes constitute a Regulatory Taking unless property owners are compensated for their loss in property values. The changes have no benefit in the Indian Village Community and the GIPAC has not shown benefit anywhere on Guemes Island. The proposal downgrades one of the most beautiful communities on Guemes Island with fantastic views, active sea life, and adequate clear water.

Issue 1: The proposed <u>New Section 14.16.360 Guemes Island Overlay</u> to the Guemes Island Subarea Plan targets communities like Indian Village by requiring restrictions that downsize existing homes. The maximum building heights that limit the sidewalls of new structures to 12 feet above the average grade at the side setback do not allow full height ceilings when the floor elevations must average 4-feet above the ground level. About 21 building lots on Indian Village community and 53 building lots on the West Beach community further south have minimum floor elevation requirements that are 3 to 5 feet higher than the existing grade. This discrepancy from the existing grade does not allow adequate building height to build full height ceilings at the required side setbacks. These restrictions may constitute a Regulatory Taking by reducing building options and property values for no logical reason.

Discussion: About 18 of the 21 homes on the flat area of Indian Village West Beach are on lots with only 50 feet of beach frontage. The lots are flat at the beach front for about 100 feet and then they slop upward for about 200 feet to an elevation of between 60 and 80 feet higher at

West Shore Road. About half of the 21 homes are built with a floor elevation of 3 to 5 feet above their average ground grade to meet minimum flood requirements. The remaining beachfront homes are vulnerable to flooding from a combination of high tides, low atmospheric pressure, and storms. After being flooded the majority of these home owners will likely pursue reconstruction with higher floor elevations. The proposed building requirements will severely downsize reconstructed homes and increase the scale differential between the reconstructed homes and larger existing homes at higher elevations. A 4-foot floor elevation with 12-foot sidewalls will not allow full height interior ceilings

The West Beach to the south enclosing Edens Road and Lervick Road has similar issues with about 21 of 53 homes having floor elevations to current building code standards. The remaining homes with lower floor levels will have similar issues to Indian Village West Beach except that most of the lots have more beach frontage. The larger lot width will increase options but also increase side setbacks with the 30% of the lot width for required side setbacks.

Issue 2: The proposed building restrictions do not achieve their objectives in the Indian Village community or perhaps other communities. They achieve the opposite effect in Indian Village and destroy attractive building options. The restrictions are especially restrictive in the narrow lots in Indian Village. They limit many good design options such as side gables to enable a sloping roof to the front; and open concepts with great rooms; and frontage area for rooms with view windows; and adequate sloped roofs to prevent high winds from blowing rain up hill and into roof vents. Homeowners would be forced to build to maximum dimensions so all new homes would have the exact same shape being dwarfed by existing structures. All new homes would look alike instead of having unique character. The building restrictions would require all new home to be smaller than all existing homes and increase scale differential. Homes in Indian Village would be forced to be narrow in front and long on the sides making more rooms with windows facing their nearby neighbors instead of the natural beautiful views of Bellingham Channel.

Discussion: The proposed building envelope prohibits good design alternatives on narrow lots that make homes more attractive and livable. Most people reconstructing their homes in Indian Village want an attractive but unique design maximizing western views and outdoor recreational areas.

The proposed standard sidewall height prohibits side gables that allow roofs to slope toward the house front. Side gables with roofs sloping toward the house front allow roof overhang in the front to provide cover from sun and rain for outdoor seating. Many Indian Village homes enjoy outdoor benches and chairs in front for the beautiful views of islands over Bellingham Channel.

Limited wall height at the side setbacks and sloping heights require any rooms at the second level such as a master bedroom to be built in the center of the house and at a 14-foot

maximum width outside dimensions. Second level rooms require load bearing walls on the first level. The rooms are built most efficiently above house corners where they can use two exterior walls as load bearing walls. When second level rooms are built in the center of the house load bearing walls break up the potential for open spaces on the first level. Open spaces provide options like great rooms that include living rooms, dining rooms, and kitchens. Great rooms are currently popular and are very efficient for providing a spacious environment.

The proposed sloping height limit will not even allow the proposed 30-foot maximum building height on a 50-foot lot. A second story room could not have a roof with adequate slope to prevent high winds from blowing rainwater up hill and into roof vents. Water in roof vents dampens insulation, causes ceiling leaks, and water damage that destroys house values.

Restrictions such as no side gables, second level rooms in the house center, and building height tend to make all new houses look alike. This similarity could make neighborhoods look more like some kind of low income housing project than a diverse community with unique character. People that take pride in their homes often want to have unique features that set their home apart from all the others. Making all the homes in a neighborhood look alike does not enhance the beauty of Guemes Island. Homeowner need design options to build the home of their dreams.

The building envelope tends to restrict the size of new homes but does nothing to the limit size of existing homes that are generally newer and larger. Since all lots on Indian Village have existing homes, the larger new homes will remain large and the smaller older homes will be size restricted creating more scale differential.

Both Indian Village and West Beach communities have about half larger homes with floor elevations meeting current standards. These are newer homes that will not likely be reconstructed for a long time. The older homes at lower elevations are more likely to be impacted by more restrictive building codes. Limiting their size keeps them under scaled in comparison the larger homes.

Recommendation: Scrap the new Section 14.16.360 until the GIPAC inventories the damage they are causing and notifies property owners of proposed action. They developed these standards to help in some unknown situations in a community without regard of the hardship they are causing other communities such as Indian Village. They have received only one comment (me against the proposal) from the Indian Village community. They state their goals as protecting views and preventing out of scale buildings. However, their regulations would cause the opposite effect in Indian Village and possibly other communities as well. In a quick survey in the last week 11 home owners on West Beaches did not know of any proposed action. Zero knew of proposed action. If the GIPAC members intend to represent the people, they need to solicit input from all communities on Guemes Island.

Typical Example - Madden Home: About 9 of 21 lots in the flat portion of the Indian Village neighborhood have homes vulnerable to flooding by a combination of high tides, low atmospheric pressure, and high winds. An additional two lots do not currently have beachfront homes (homes setback). If flooded, the reconstruction of the beachfront homes requires a higher main floor height to meet current building codes and prevent future flooding. The proposed building standards severely restrict the possibility of building a replacement home anywhere near the scale of other homes in the neighborhood.

The Madden house built in 1952 and expanded in 1976. It is vulnerable to flooding during a perfect storm with a main floor about 6 inches above the ground elevation. This mild winter high tides carried driftwood within 10 feet of the house. The lot has 50 feet of beach frontage. The property is flat easterly from the beach for about 100 feet and then slopes upward for about 200 feet to an elevation about 75 feet higher at West Shore Road. The building is a single story home with a second story master bedroom in a back corner of the home. The two homes to the north and the two houses to the south are two story homes.

The proposed standards would not allow this home to be raised 4-feet. The require a home and master bedroom more narrow with small interior rooms instead of the existing great room. The roof would have no overhang in front for weather protection. Potential buyers would lose interest facing flooding or a smaller out of scale home. The changes would not increase island beauty, livability, scale, or views. The would increase scale differential.

Pictures: The following pictures illustrate the issues that exist in the Indian Village neighborhood

Five homes in the Indian Village neighborhood with the Madden home being the third. It is completely out of scale and if it were reconstructed it would be much smaller if within the proposed envelope

Current building codes require the main floor at a higher elevation than the ground line. This home shows the typical stairs required to get to the main floor elevation with currently building codes.

The existing Madden Home. Building codes require a new floor height about a foot higher than the bottom of the windows. The building envelope requires the home to be more narrow, no second story master bedroom, no side gable providing front roof overhang, and more out of scale to the neighboring homes.

Prepared by
Mark Madden P.E., PTOE
206 660 1209
mtsmark@comcast.net

From: cc mcguiness
To: kirtj@co.skagit.wa.us; PDS comments
Subject: Comprehensive Plan 2016 Update - SUPPORT
Date: Thursday, April 14, 2016 9:12:25 AM

I support: *Policy 2A-6.2 Adopt plans, policies, codes and development standards that promote public health by increasing opportunities for residents to be more physically active. Such actions include: concentrating growth into Urban Growth Areas, promoting more compact urban development, allowing mixed-use developments, and adding pedestrian and non-motorized linkages where appropriate.*

- *Policy 2A-6.3 Concentrate facilities and services within Urban Growth Areas, using urban design principles, to make them desirable places to live, work, and play; increase the opportunities for walking and biking within the community; use existing infrastructure capacity more efficiently; and reduce the long-term costs of infrastructure maintenance.*

The Transportation Element includes several new or expanded policies supporting non-motorized transportation, including the following (new text is underlined):

I support these additional sentences below.

- *Policy 8A-6.4 Provide for the diverse needs of bicycle, pedestrian and equestrian modes through appropriate routing and the utilization of single-use and shared-use facilities. Encourage public education for motorists and non-motorized users alike on the importance of "sharing the road," consistent with Traffic Safety policy 8A-10.3.*

- *Policy 8A-6.6 Coordinate system planning, funding, and development with other local, regional, state, federal and tribal jurisdictions;and with public transit providers, as most public transit trips begin and end with walking or biking.*

- *Policy 8A-6.11 Community and subarea plans should identify and address the implementation of pedestrian, bicycle and (where appropriate) equestrian facilities that provide safe, efficient and convenient access to residential neighborhoods, schools, parks and recreation facilities, commercial districts, activity centers, tourist areas and established or planned multi-use trails.*

I also support establishing a committee to develop a real bicycle and pedestrian plan.

We know companies and communities grow and are healthier because of infrastructure that supports ACTIVE mobility.

- *Policy 8A-6.12* ***Emphasize maintenance of existing non-motorized facilities, including road sweeping, striping, signing, and debris removal, and the ongoing development of smooth and continuous road shoulders, including asphalt overlays or enhanced chip sealing where appropriate and feasible.***

Thank you for your hard work !! And for allowing my comments.

Cynthia McGuiness

3807 Seneca Drive

Mount Vernon, WA 98273

360-428-1816

From: Katie McNett
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Thursday, April 14, 2016 11:15:03 AM

Public Comment

April 14, 2016

Thank you for including the Open Space Plan and the Non-motorized Transportation Plan in the 2016 Comprehensive Plan Update.

I spoke at the Public Hearing in support of non-motorized transportation and was called out as a “hobbyist”. Let me counter by saying, perhaps we should not support road construction and maintenance because I consider driving a car to be a “hobby” for some people, or limit farming equipment on roads because farming is a “hobby” for some people. My point: bicycles are no more a hobby than any other road user and it's not okay to call them out as anything less. Bicycling is a way to get from A to B, just like any other transportation mode.

Bicycles are the most affordable, efficient, and sustainable form of transportation in the world. They are not cars, nor pedestrians, though legally they can be either, and share the same rights and responsibilities. People say, “I don’t see the cyclists or pedestrians, why should we build a trail for them?” Many roadways don't have a shoulder and have high speeds, of course you don’t see them, because they value their lives and don’t feel safe! If you build it, they will come. If the County served as a multi-modal transportation network of highways, roads, *and* shared-use paths that connected all urban and suburban hubs, you would see them. Before tracks there weren't trains, before roads there weren't cars, and before we have trails, we won't see bikes.

I strongly urge you to adopt the Open Space Plan and the Non-motorized Transportation Plan in the 2016 Comprehensive Plan Update. To not do so would significantly cripple the community and the future of the valley. Skagit County with its tulips, connections to the North Cascades and San Juan Islands, and pastoral views is one of the most beautiful counties in Washington. This state gets 3.1 Billion dollars in revenue from recreational cyclists and people who commute by bike shop more often and spend more money. If you’re trying to get people to the valley, it’s clear that supporting bicycling is the way to do it. Additionally, a

growing county population (35%) can not or chooses not to drive and we need to serve their needs by providing transit and non-motorized options.

I support Policies 8A-6.4, 8A-6.6, 8A-6.11, 8A-6.12, 2A-6.2, 2A-6.3, 2B-1.3, 5A-5.1(m), 5A-5.1(u), 5A-5.3(w), and the inclusion of several non-motorized project items in the 20-year list in Section 5.7 (Exhibit 25 & 26). I would like to see the addition of goals, benchmarks, and performance measures for the Non-motorized Plan. Goals help elevate a plan from a New Years Resolution to achievable action items. I would be happy to assist on a taskforce to implement these plans.

Thank you,

Katie McNett

13797 Trumpeter Lane

Mount Vernon, WA 98273

From:	Metcalf, Mitchell
To:	PDS comments
Cc:	Bell, Marjorie
Subject:	Comprehensive Plan 2016 Update
Date:	Thursday, April 14, 2016 2:15:34 PM
Attachments:	mg_info.txt

Dear Skagit County Planning Department Staff,

Thank you for your work in bettering the lives of Skagit County residents.My comments about proposed goals, policies, and recommendations in the 2016 Skagit County Comprehensive Plan update are in support of language that recognizes the importance of trails to benefit health, the environment, and the economy. Please continue to use language in the plan that highlights how our built environment can bring about improved personal, environmental, and economic health for everyone. I support the suggestions made previously by my coworker Marjorie Bell (see below).

I would also like to note that this Comprehensive Plan supports the goals of the trail planning group in the town of Concrete. The Concrete Trails Committee has recently finished our Concept Plan which outlines the surveying and planning efforts we have made. It also stresses the numerous ways that an improved trail system can facilitate a movement towards improved community health.
The Concept Plan can be viewed here: https://drive.google.com/file/d/0B8U9FkO3ytScY2NaRC16amVvaDA/view

Thank you for your time, and consideration of our suggestions.

Mitchell Metcalf
2241 Hospital Dr
Sedro-Woolley, WA 98284

From: Bell, Marjorie
Sent: Wednesday, April 13, 2016 3:27 PM
To: pdscomments@co.skagit.wa.us
Cc: Jason Miller (goodwords@frontier.com); Hawk, Carol; Liz McNett Crowl
Subject: Comprehensive Plan 2016 Update

Hello Skagit County Planning Department Staff:

First of all, thank you for your tireless efforts on behalf of Skagit County residents. I appreciate all that you do! My comments about proposed goals, policies, and recommendations in the 2016 Skagit County Comprehensive Plan update are in support of language that recognizes the importance of trails to benefit health, the environment, and the economy. Please retain the proposed language in the plan (highlighted in yellow; new text underlined) for improved personal, environmental, and economic health for everyone.

Chapter 2, Urban, Land Use and Open Space Element

Policy 2A-6.2 Adopt plans, policies, codes and development standards that promote public health by increasing opportunities for residents to be more physically active. Such actions include: concentrating growth into Urban Growth Areas, promoting more compact urban development, allowing mixed-use developments, and adding pedestrian and non-motorized linkages where appropriate.
Policy 2A-6.3 Concentrate facilities and services within Urban Growth Areas, using urban design principles, to make them desirable places to live, work, and play; increase the opportunities for walking and biking within the community; use existing infrastructure capacity more efficiently; and reduce the long-term costs of infrastructure maintenance.
Policy 2B-1.3 Implement the adopted Skagit Countywide UGA Open Space Concept Plan to conserve open space areas, greenbelts and corridors within and between urban growth areas.

(a) Plan implementation should seek to protect lands useful for recreation, wildlife habitat, trails, and connection of critical areas, and working farm and forest lands.

Chapter 8: Transportation Element

Policy 8A-6.4 Provide for the diverse needs of bicycle, pedestrian and equestrian modes through appropriate routing and the utilization of single-use and shared-use facilities. Encourage public education for motorists and non-motorized users alike on the importance of "sharing the road," consistent with Traffic Safety policy 8A-10.3.

Policy 8A-6.6 Coordinate system planning, funding, and development with other local, regional, state, federal and tribal jurisdictions; and with public transit providers, as most public transit trips begin and end with walking or biking.

Policy 8A-6.11 Community and subarea plans should identify and address the implementation of pedestrian, bicycle and (where appropriate) equestrian facilities that provide safe, efficient and convenient access to residential neighborhoods, schools, parks and recreation facilities, commercial districts, activity centers, tourist areas and established or planned multi-use trails.

Policy 8A-6.12 Emphasize maintenance of existing non-motorized facilities, including road sweeping, striping, signing, and debris removal, and the ongoing development of smooth and continuous road shoulders, including asphalt overlays or enhanced chip sealing where appropriate and feasible.

As a bicyclist and a bike commuter, I consider trails to be an essential part of Skagit County's transportation network. I do not consider bicycling to be a "hobby" but as a mode of transportation, in the same way that my colleagues who drive to work think of the automobile to be their mode of transportation. Furthermore, when I bike to work I arrive invigorated and fully awake, without contributing to traffic or competing for a parking space (I have yet to meet anyone in favor of traffic jams or too few parking spaces.) A British Columbia Cycling Coalition study showed that physically active employees work at full efficiency throughout the day, resulting in 12.5% greater productivity, which can save $572 per employee per year. Improving walking and bicycling conditions benefits all roadway users, especially in urban areas where around 50% of all trips are less than three miles in distance. In addition, by biking I have met or exceeded the recommended minimum of 30 minutes a day of vigorous physical activity, and will likely cost less in long-term health care costs than most Americans my age. Best yet, I do own automobiles (as do most bicyclists) and pay the same auto-related taxes that everyone else pays. I believe in allocating public funding toward healthy built environments such as non-motorized trails. Rather than a frivolous expense, it is a sound investment in the future.

The Rails to Trails Conservancy estimates the monetary value of the benefits of walking and bicycling in the US to be $4.1 billion per year, an amount that reflects transportation costs, oil dependence, climate change, and public health benefits. They also estimate that increasing the mode share of walking and bicycling from its current 9.6% to 25% would result in $65.9 billion annually in accrued benefits.

In terms of landowner objections to trails, many of the more verbal Skagit residents are motivated by individual convenience, suspicion, or fear that trails will reduce property values. In fact, several studies have shown a positive correlation between property values and proximity to bicycle and pedestrian amenities. In a National Association of Home Buildings and National Association of Realtors survey that asked about the most important community amenities, 36% of respondents indicated that jogging and bicycle trails were most or very important, and 26% indicated sidewalks. Another study from Florida found that people were willing to pay $20,000 more for homes in pedestrian-friendly communities!
The recent designation of SR20 as US Bicycle Route 10 (USBR10) has great potential to be an economic booster for Skagit County communities along the route. Safe, convenient linkages would make this a great draw for bicycle tourism!

Lastly, I would like to point out how the proposed non-motorized trail language in the 2016 Comprehensive Plan update aligns with and supports Skagit County's 2013 Comprehensive Parks and Recreation Plan, which includes the following
Trail Development Objectives: *f*

- Skagit County will work with other county, state, and city parks to establish links and connecting trails. *f*

- Provide trails for pedestrians (including, where feasible, access for persons with disabilities), bicyclists, equestrians, and other trail users. *ƒ*
- Provide for linkages of population centers, community facilities, workplaces, neighborhoods, schools, recreation areas, open space and cultural/historical areas. *ƒ*
- Coordinate with other agencies to ensure a comprehensive approach to trail planning. *ƒ* Separate recreational trails from motorized vehicle traffic where feasible. *ƒ*
- Create a management policy for SCPR operated trails. Skagit County Parks & Recreation Comprehensive Plan: Goals and Objectives 4 - 5 *ƒ*
- Coordinate with regional subarea plan processes to assure trail connectivity objectives are being accounted for.

In addition, this plan's Level 1 (highest priority) is:

- Other Trail Development and/or acquisitions

The section entitled "RECOMMENDED TRAILS PLAN" notes that, " Trails continue to be the most demanded recreational facility asked for by Skagit county residents. The 2007 State Comprehensive Outdoor Recreation Planning (SCORP) surveys show similar trends. The (SCORP) document makes recommendations for local agencies and encourages trail opportunities. The plan specifically states, "If there is a weakness in the local response statewide, it may be in addressing high-participation activities that take place away from a traditional park, especially bicycling and walking. Health professionals increasingly regard walking and bicycling, both for recreation and transportation, as valuable tools that can help people build healthier lifestyles. Community oriented trails, paths, and routes for walking and cycling can encourage people to participate in health oriented activities; encourage children to walk or bicycle to school; and encourage adults to commute without a car"

For more information on how trails can benefit Skagit County, please view Cascade Bicycle Club's report, "The Benefits of Bicycle and Pedestrian Projects: Quantifying and Prioritizing Non-Motorized Transportation Investments" at https://issuu.com/cascadebicycleclub/docs/cascade-tptguide_2012/1

Thank you,

Marjorie Bell
45501 Main Street
Concrete, WA 98237

Marjorie Bell, Program Planner
Community Health Outreach Programs
United General District 304
2241 Hospital Drive
Sedro-Woolley, WA 98284

From: Connie Munsey
To: PDS comments
Subject: Comp Plan Update - Transportation Element
Date: Wednesday, April 06, 2016 9:13:44 AM

April 6, 2016

RE: 2016 COMP PLAN UPDATES – Transportation Element

Pursuant to my comments at last night's hearing, here is a written version with additions.

In reviewing the materials backing up the Comp Plan update, I was disappointed to see a bunch of new projects on the TIP list. FIVE of these, with estimated costs of $63 million are for more bicycle trails.

Over and over and over there has been testimony from property owners objecting to the use of transportation tax $ (after all – the grant money did come from taxpayers, not the Federal Government's secret stash). This is merely subsidizing a small, elite group of hobbyists who pay absolutely nothing towards marring our lovely RURAL countryside with paved trails. It may sound lofty and wonderful to subsidize healthy habits, but that is not government's role. What is next: government subsidies and statutes ala New York City to limit food choices, or for gym or yoga memberships?

A few months ago, at a fairly well attended SCOG transportation visioning session, we had the usual poster boards and colored stickers to affix to projects we favored. A number of folks put the stickers on bicycle plans. However – when the moderator later asked how many of us rode bicycles or wanted these projects to be a high priority, NOT ONE HAND was raised in answer to either question. The dirty little secret on these sessions – is that if attendees were given the option "none of the above" when asked about how to use tax $, the "visioning" outcome would be much different.

One speaker last night commented on how much money bicycles bring to Washington State. That does not justify the takings from private property owners that these trails would require. KELO eminent domain practice was reversed by the court. "Public benefit" does not include public lust for tax dollars.

Therefore, I respectfully request that before final adoption of this plan update, the new (as yet unnumbered) bicycle projects be removed from the TIP list.

Connie Munsey

2411 Skyline Way, #205

Anacortes, WA 98221 Mobile phone: 360.770.1419

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From: Susan O"Donnell
To: PDS comments
Subject: Fwd: Skagit County 2016 Comprehensive Plan Update
Date: Thursday, April 14, 2016 11:00:46 AM

---------- Forwarded message ----------
From: **Susan O'Donnell** <sdnnll@gmail.com>
Date: Thu, Apr 14, 2016 at 10:57 AM
Subject: Skagit County 2016 Comprehensive Plan Update
To: pdscomments@co.skagit.wa.us

(Hello, PO Box added)

Name: Susan S. O'Donnell

Address: 6112 South Shore Road (Guemes Island), PO Box 1982, Anacortes WA 98221

Before moving to Guemes in summer of 2013 I had heard of the Island Sub-Area Plan and all the work done by residents on the Guemes Island Planning Advisory Committee (GIPAC). Most property owners here realize what a special place this is and we want to be responsible citizens.

Water is, of course, a necessity and for many generations folks in this county have had nearly unlimited use of water. Recently this is changing. Overuse and diminished rainfall some years has caused the occasional Guemes well to fail. Some properties close to the shoreline have wells which deliver "funny-tasting" water. There are individual wells, hand dug, drilled, shared wells, community wells, delivered water service, the reverse osmosis plant on West Beach and the rather newly approved, excellent idea for catching rainwater for household and use in the garden.

My grandparents – born in 1880s – came to Anacortes from a farm in Illinois in 1913. Ten years later they bought one of the 50 foot wide North Beach lots in the Alverson Camping Tracts. Camping they did on nice weekends and during summers, staying as long as the clean clothes and food supply held out. Then, it was back to Anacortes for supplies and laundering. Fresh milk was easy since there was a dairy farm on North Beach which delivered.

For twenty or so years, my family's camping on North Beach did not require a well for their summer/occasional use of the cabin that eventually grew from a tent platform to washed up logs for the foundation, salvaged boards for the walls, and cedar shingles for the roof. The bay was fine for bathing, rain was enough for the garden and a generous neighbor allowed the kids to "carry" water from his well for cooking and drinking. 20 more years passed and my grandparents did have a well drilled, well back from the beach, across Guemes Island Rd. About that time they moved from Anacortes to Guemes Island full time until age & infirmities necessitated a move back to Anacortes in the 1960s.

In the 1970s the original North Beach cabin was replaced with a modest, one-bath house. Since then, family members have been appalled at the mega houses approved to be built on similar 50 foot wide lots on North Beach. Gradually our family has became more aware of water use, installed water meters and constantly remind guests and neighbors to use water

sparingly. Users of the North Beach cabin bring water for drinking but do use the well water for cooking.

My husband Patrick and I have lived on the south side of Guemes at 6112 S.Shore Rd since summer 2013. We collect rainwater for outside use. A well was drilled on the property in 2000 and serves only our single level house. The house is built high over one of the feeder bluffs which is constantly eroding even though we try to maintain the native plantings of salal, douglas firs, snowberry, noootka rose and madrone.

We fully support the comments GIPAC has made on the "Comprehensive Plan 2016 Update" and hope the County will move quickly to approve the proposals needed to implement the Guemes Island Sub-Area Plan.

- the Seawater Intrusion Policy will protect our scarce water resources

- the Guemes Zoning Overlay will protect the rural character of the island, help prevent the overuse of the island's sole-source aquifer, and will moderate growth to an appropriate and manageable scale.

Sincerely,

Susan S. O'Donnell

6112 S. Shore Rd, Anacortes WA 98221

Date: April 5, 2016
Re: Presentation to Skagit County Planning on the Comprehensive Plan 2016 Update

RECEIVED
APR 15 2016
SKAGIT COUNTY
PDS

My name is Stephen Orsini. I reside at 4971 Guemes Island Rd. on Guemes Island's North Beach. I grew up on this property, acquired by our family in 1954, attended the Guemes Island School, and returned to live on the same property in 1989.

I was a member of the original Guemes Island Planning Advisory Committee (GIPAC) which completed the Guemes Island Sub-area Plan in 1992. So I am most impressed with the work of the current GIPAC Board in not only attaining recognition of the Sub Area Plan, December 2010, but achieving the possibly of its implementation as part of Skagit County's 2016 Comprehensive Plan Update.

Today, however, I am commenting as a private citizen. By 1994, after some 50 years of service our well on Guemes was failing due to seawater intrusion. From 1990 to 1994, seven new wells had gone into production on private properties within a radius of about ½ mile of our well. The reason for the seawater intrusion is summarized by the Ghyben-Herzberg Equation applicable to island aquifers on Guemes. Island aquifers have a slight doming effect inland, but for every one foot the head height of the aquifer is reduced say by increased pumping, the seawater moves up forty feet near the beaches where historically the majority of the homes were placed. After years of carrying our drinking water from Anacortes, I was able to solve our potable water crisis by installing a whole house water catchment system which we have been using without problem since March, 2006.

Despite the failure of more wells on the north end of Guemes to seawater intrusion including the 30 hookup development of Potlatch on West Beach in 1998, the County has not changed its building code which requires a well before a building permit can be issued. The current GIPAC recommendations strongly endorse the use of water catchment for new building on Guemes, but this recommendation cannot be implemented without significant modification of the Skagit County Health Code, Chapter 12.48. This county code and indeed the building permit application process still discourages rainwater catchment.

On March 21, 2016, the State Department of Ecology's Water Resources Advisory Committee presented to Skagit County their Policy 1017, which states that ". . . a water right isn't required for on-site storage and use of rooftop or guzzler collected rainwater. " It was noted that some landowners in the Skagit River Basin have obtained building permits for homes using appropriately designed rainwater collection systems. Given the number of well failures and the major problem of seawater intrusion on the north end of Guemes Island, the SCC language needs to be changed post haste to prioritize rainwater catchment as the preferred solution in the attainment of a building permit.

Currently, no permit or review process is required prior to putting in a well on Guemes. Additionally permitting rainwater catchment instead of well drilling in areas of known seawater intrusion on Guemes stops the insidious "taking" , moving a senior water rights holder's access to potable water in its de-facto transfer to a junior water right well inland as the new well is further from the sensitive fresh water/seawater interface and, for a period of time, less subject to seawater intrusion.

Thank you for the opportunity to comment,

Stephen Orsini

6132 S Shore Rd
Anacortes WA 98221

RECEIVED
APR 08 2016
SKAGIT COUNTY
PDS

April 6, 2016

Skagit County Planning and
Development Services
1800 Continental Place
Mt. Vernon WA 98273

To: Skagit County Planning Commission
Subject: Comprehensive Plan 2016 Update - Guemes Island Sub-Area

Thank you for inviting our comments. As an island resident for more than 40 years I have continuously kept informed about the hard work of the GIPAC committee and others in developing the subarea plan, and have been an active participant in meetings. My comments below pertain to two proposals which I urge you to approve as soon as possible.

I enclose for your reference an abbreviated report from the American Institute of Architects (AIA) Sustainable Design Assessment team (SDAT) summarizing the several-day series of meetings in 2006 which, as you recall, included many county-wide officials as well as island residents and others as participants in these meetings. Guemes Island was honored to be selected by the AIA for this important study to ensure sustainability of this vulnerable, valuable island. GIPAC and residents have paid attention to the AIA recommendations. I have highlighted the areas in this report which pertain to the two proposals in question: (1) rural character and (2) water resources.

(1) Rural character (refer to p 2 of AIA report): I fully support the proposed new zoning overlay regarding heights (30 feet, not 40) and setbacks of buildings . Please implement this into the plan.

(2) Water Resources (refer to p 3 of AIA report): I fully support the seawater intrusion policy for codification in the critical areas ordinance. I also concur that rainwater collection is top priority. If the water table becomes depleted there is no turning back - this tragedy will be catastrophic and irreversible. Much more needs to be done, however. Please implement into the plan.

Sincerely,

Joan H. Palmer

Joan H. Palmer, 6132 S Shore Rd, Anacortes WA 98221

Enclosure

The American Institute of Architects

About The AIA Programs & Initiatives

Guemes Island, WA Daily SDAT Update

Friday, June 23, 2006
Contributed by: Marj Charlier

GUEMES ISLAND – It was a beautiful early summer night on this island far north in Puget Sound. Yet, instead of paddling out in boats to a beer on the porch of the general store with friends, 188 of the 800 island residents crowded into the small community hall here, many star the chairs filled up.

The topic, however, wasn't the kind of sudden catastrophe that generally brings communities together in meeting halls, but a concern about the sustainability of their island.

The meeting marked the end of a three-day Sustainable Design Assessment Team (SDAT) visit sponsored by the AIA's Center for Commu SDAT method is a charrette process designed to help communities committed to planning for a sustainable future by recruiting out-of-towr objective experts in architecture, landscape architecture, ecology, economics, transportation and other specialties who volunteer to help co choices and issues and clear a trail toward formulating strategies and solutions.

"This process isn't about losing – losing rights or independence or anything. It's about gaining – gaining as an individual, as neighbors, as a Gees, team leader for the community planning process, told the gathered community.

The Guemes Island Planning Advisory Committee (GIPAC) applied for the SDAT grant and assistance as a way to accelerate the developr a part of the Skagit County Comprehensive plan.

The charrette, held mainly at Guemes Island's Community Center June 20th through 22nd, included a community tour for the visiting SDA meetings along with a day and a half of roundtable meetings where about 60 community stakeholders discussed five areas of interest: trans energy; rural character; water supply and quality; and wildlife, shoreline and open space as well as other issues that were on their mind. (See the SDAT section for more details about the process and the program.)

Following the roundtable discussions, the AIA team members prepared findings and recommendations, including some short-term strategie that could help:

- preserve the island's rural character,
- conserve water and protect the quality of the island's sole source aquifer,
- resolve transportation disagreements,
- protect wildlife and shoreline habitat, and
- increase island energy independence.

They presented their findings at the Thursday night meeting.

"The keys to this process are that we bring the objectivity of outside experts that form a multidisciplinary team and we focus on public pa Livingston, Director, Community by Design, a program of the AIA. SDAT team leader Gees, an associate with Kuhn Riddle Architects, Ar that focusing on sustainability, and its three components – the economy, the environment and social/cultural traditions and equity – provide community stakeholders to participate in the process by providing a lens through which differing points of view can find common ground.

Illustrating that point was the attendance at the charrette by Skagit County officials, including Don Munks, County Commissioner; Jeanne K of the Skagit County Health Department; Steve Cox, Guemes Ferry Manager; and Jeroldine Hallberg, Betsy Stephensen and Ann Bylin, of Department. The relationship between the county and island residents has been severely strained of late over such things as expanded ferry interest in self-determination expressed by some island residents.

"It's gratifying that these county officials saw enough merit in the SDAT process and care enough about the island's future to put aside thei the meetings, " said Gees. After the first few meetings in Guemes, county officials asked Gees if the AIA could help coordinate charrettes county to help resolve log-jams in their planning processes as well, she said. "I'm proud that we have brought a process to the table that wi its residents to get back together and work out their conflicts."

Guemes Island had been warned that it would be some time before the county would have the funds to address Guemes Island's issues, bu development pressures on the eight-square-mile island with incredible coastline views were calling for a more immediate response. The pr the best in the local community, local leaders of the island effort said.

"I was overwhelmed by the public response," said Roz Glazer, vice chairman of GIPAC. "People seemed to understand the importance of been thinking about the issues, they came prepared to contribute to the discussion, and they did so in meaningful, constructive and creative to the process, but also to the sensitivity and attitude of the AIA team members. "I think their presence gave this community comfort so the threatened, even though the experts came from more than 50 miles away," Glazer said, poking a little fun at the natural provincialism of he isolated island.

Throughout the SDAT meetings, community participants commented that the sessions were far more valuable in examining the bases of the positions than they had expected. "One of the things that really impressed me was how many different voices and people, who often disagr in this process," said Edith Walden, an orchard owner on Guemes Island, a local business woman, and one of the roundtable participants. " made us all aware that we do have a community with a common vision. It's made us all energized and hopeful about our future."

The results from the SDAT meetings will be used to help develop the island's sub-area plan, ensuring the AIA and the community that the shelf and gather dust. Among the recommendations in their final reports were:

Energy independence: Guemes Island has numerous solar, wind and other alternative energy producers among its 800 permanent resident work to foster continued experimentation and leadership in energy independence, said David Stecher, a mechanical engineer with The Ecol Laboratory of Urbana, Illinois, a non-profit organization that designs highly energy-efficient and healthy houses. In addition, the island shou county officials to promote use of subsidized weatherization programs, investigate building a small scale biodiesel plant for island vehicle Energy Efficiency Club (GEEC) to help promote energy efficiency and alternative energy production among officials, businesses and resid work session had ended, the members of the energy roundtable had agreed to set up the club, and many volunteered to work on it.

Transportation: Jack Werner, a consultant from the Climate Institute of Washington, D.C., recommended that islanders improve their com Anacortes and county officials and to help resolve disputes over their ferry service, which provides the only public access to the island. H several recommendations for the county for capital improvements to parking, landings, waiting areas and bicycle storage at the ferry termi suggestions for fare structures that would encourage car-free travel, recommended that islanders improve road signage to reduce speeding bicycle traffic, expand biodiesel production on the island to fuel the ferry and other vehicles, develop photovoltaic charging stations for ele explore the possibility of producing ethanol on the island.

Rural character: To preserve the unpretentiousness and small scale of island buildings, Walt Cudnohufsky, a landscape architect from we encouraged the islanders to establish voluntary architectural guidelines for new construction to help newcomers understand the island's cul embrace values reflecting a strong sense of community, neighborliness, an unhurried pace of life, respect for privacy, awareness of history, shore, creativity and an independent spirit," said Cudnohufsky. He also suggested that islanders seek to cluster development and to initiate fund in order to keep the rural open space even as new residents come to the island. Islanders can help preserve their rural culture and intr

developing an inclusive welcome-wagon program and by offering more tours of gardens, art, forestlands, wildlife and innovative energy prc

Water resources: Warren Flint, an ecologist and sustainability consultant with Five E's Unlimited in Seattle, commented that the island shc important data of the overall island water supply to develop a scientifically based water budget for the Guemes Island system that is under stakeholders. He also recommended that the island conduct education and awareness regarding Island water resources, encourage cooperat Department of Ecology and Skagit Country Planning and Health Departments, insure that all wells and homes are metered for water use, lir on the island to enhance recharge capacity and minimize freshwater runoff, encourage clustered domestic waste water treatment facilities fc encourage home water conservation, increase shoreline setbacks, and reduce the allowable building size to lot size ratio.

Wildlife, shorelines and open space: About 70% of the island's shoreline properties are owned by senior citizens, and in light of their imı should find ways to protect or acquire them for wildlife and public access, said Glenn Acomb, a landscape architect from the University of recommended that islanders protect or restore interior island lands that are important to open space, wildlife or for the island's aquifer by v agencies and educating the public about the importance of protection.

In addition to the specific interest area recommendations, team leader Gees suggested that the community forge new relationships with neig help resolve issues, and to continue to work with the Samish tribe, whose interests in their former tribal lands are in line with the interest oı protect its rural character, island ecology and cultural heritage.

Over the next year, the SDAT team members and AIA staff will be available to the community leadership for consultation, and a couple of revisit the community after a year to provide additional feedback and expertise as needed.

Thursday, June 22, 2006
Contributed by: Marj Charlier

GUEMES ISLAND – Wednesday (June 21) was the longest day of the year north of the equator. But for the residents and AIA volunteers : plan for Guemes Island's future, it was barely long enough. Residents of this far-northwestern island of Washington State began showing u to get started working with the AIA's Sustainable Design Assessment Team (SDAT). Pads and pens in hand, they drifted into the Guemes (khakis, dress pants, long peasant skirts, Birkenstocks, cowboy boots and loafers, their dress visibly representing the diversity and various

life of the residents of the island.

"I am always impressed with how many people really get involved" in the community, said Joost Businger, chairman of the Guemes Island Committee (GIPAC).

This motivated and eclectic group of islanders, brought together by the AIA's Center for Communities by Design's SDAT Program and (GI goal: the hope that their work will provide much of the philosophy, direction and tools that will eventually be adopted as the island's land-u County. (See the SDAT section for more details about the process and the program.)

"What's very, very clear is that your main concern is controlling growth that's compromising your rural future," said Erica Gees, team lead SDAT, as she sent the volunteers home Tuesday night, following a public meeting that allowed all citizens to come and express their hopes 8-square-mile island. Harvesting that passion for the island's rural nature set the agenda for Wednesday, as about 60 of the island's 800 res began sifting through their opinions and preferences, and sorting them into a concrete set of proposals for preserving their island way of life

The roundtables and a sample of their discussions so far are:

Renewable Energy: In applying for the SDAT grant, GIPAC told the AIA that one of its highest priorities was reducing dependency on off supplies. Even before gasoline hit $3 a gallon around the country, Guemes Islanders were feeling the pinch of high energy costs. There is n island, propane for furnaces has to be trucked across to the island by ferry and there is no public transportation. Further, many Guemes Isla already experimenting with alternative energy schemes, including photovoltaic electricity production, passive solar construction and wind g overheard in the local general store's bar are as likely to be about alternative energy technologies as about the latest TV shows.

The energy roundtable decided to focus its work on three major areas: producing its own fuel and energy such as biodiesel, wind and solar conservation; and educating key players in real estate and building professions and regulatory agencies. "We're leaning toward volunteerin permanent group to create a culture of energy efficiency on Guemes Island," one of the resident volunteers reported. "Being aware of our i it would be better to assist, not mandate or regulate."

The group was led by David Stecher, a mechanical engineer with The Ecological Construction Laboratory of Urbana, Illinois, a non-profit highly energy-efficient and healthy houses.

Rural Character: With only 800 permanent residents, Guemes Island is a place where people feel part of a community and value public p they live – largely in small homes – at the end of quiet lanes among large open spaces and forests. They value their personal safety and the pretension in their modest homes, and they worry that rising real estate values and the recent appearance of huge second homes on the isla change the rural nature of the island.

Focusing at one point on the iconic expression of this change – the big house –SDAT team members Walt Cudnohufsky asked the roundtab

feared they wouldlose if more big houses were built on the island. "Why are big houses such a problem?" he asked. That led the group to (those losses: How to ensure homes fit into the rural context, how to reduce wasteful consumption, how to ensure economic and social dive and how to buffer the impact ofrising real estate values on property taxes.

The group also identified special places on the island that helped the community retain its rural character, and discussed what can be done that the rural values of those places are protected, given the potential that their ownership or use will change.

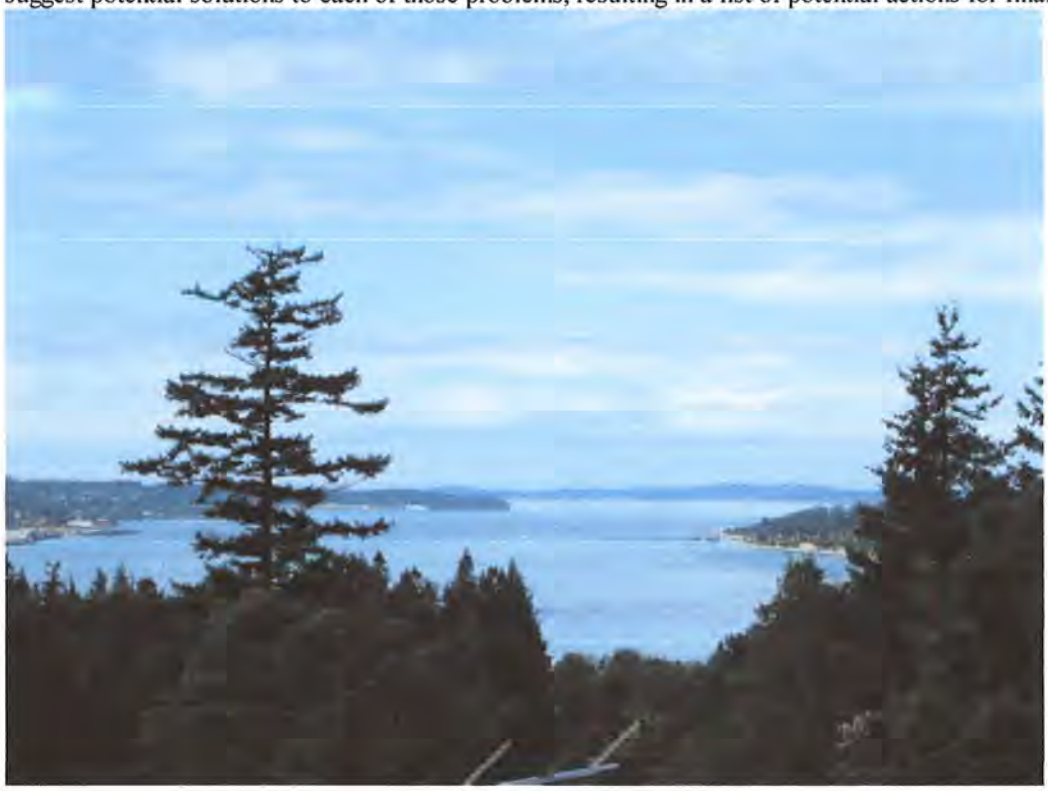
Cudnohufsky is a landscape architect from western Massachusetts, who participated as a local volunteer in an SDAT project in western M agreeing to volunteer as an SDAT team member on Guemes Island.

Transportation: The transportation group decided to organize its discussions in three areas – the ferry (which provides the only access to the island's roads, and alternative modes of transportation. Much of the group's work focused on the issues of ferry schedules and costs, a: have long believed that the limited ferry hours were a major tool in limiting the island's growth. Through the SDAT process, however, the p recognize how the ferry served as an informal community "place" where neighbors meet neighbors and news is exchanged.

At the end of the working sessions, the group adopted a vision statement calling for a "comprehensive public transport system, seamlessly county-wide transit system" that is "affordable, sustainable and fueled by alternative energy sources," involves education, public participa alternative modes of transportation, and "promotes the island's rural character."

Water resources: One of the most limited resources on Guemes Island is the water supply, of which about 90% comes from the sole sourc the island. Already, seawater intrusion into the aquifer has required some areas of the island to rely on expensive reverse osmosis water tre many homeowners have turned to rainwater collection for both potable and non-potable water uses.

The roundtable led by R. Warren Flint, an ecologist and sustainability consultant with Five E's Unlimited in Seattle, approached the task o for regulating water use and providing alternative water supply by imagining seven potential futures for the island's development, from cat stopping growth entirely. Identifying water supply and quality problems associated with each of those potential scenarios provided the tean suggest potential solutions to each of those problems, resulting in a list of potential actions for final consideration.



Open Space, Wildlife and Shoreline: According to GIPAC, one of the highly valued characteristics of the island for residents is the wildl space of the island. However, as the roundtable focusing on this area quickly discovered, island residents had a variety of perspectives on island appeared to have no pressing critical wildlife issues, such as endangered species.

Therefore, rather than focus on specific wildlife species or regulations, SDAT team member Glenn Acomb, a landscape architect from the asked the group to identify a list of potential actions that the island could take to protect open space and important wildlife areas into the f group discussed how to better protect shoreline quality, and how to enlist shoreline property owner assistance in protecting that property. T

recommendations for reaching out to large landowners with information about open space preserves, land trusts and low-impact developme homeowners with information about encouraging diversity in backyard flora and fauna.

On Thursday, following the roundtable sessions, the SDAT team will take the collected wisdom of the community and form a proposal for the experts will present their proposal at a public meeting, where they will receive feedback for a final report that will be completed follow

Wednesday, June 21, 2006
Contributed by: Marj Charlier

Residents of tiny Guemes Island, located off the tip of a peninsula on Puget Sound, are worried.

For decades, they trusted that their quiet, crime-free rural lifestyle was unassailable. Far enough from Seattle to avoid being a bedroom co isolated from big-city pressures. Although it takes only seven minutes to reach the island from Anacortes, WA, by ferry, the service's limi provided a far more effective buffer from strangers and traffic than its short trip would suggest. And since the mid-60s, when islanders suc proposal to build a huge aluminum smelter on their 8-square-mile oasis, large-scale and industrial economic development has been pretty r topic of discussion.

But enter the era of retiring baby-boomers and their oversized second homes, and suddenly, things have started to change. Small cabins on beaches have been scraped and replaced with lot-sized mansions. The county has decided to increase the ferry service to Anacortes to 10 weekday nights, threatening to bring more strangers on the island past dark. More people and more houses are threatening to overtax the isl aquifer isn't recharging fast enough to keep saltwater from seeping into some coastline wells and water systems.

"It wasn't any one certain thing" that sparked the island to action, says Joost Businger, chairman of the Guemes Island Planning Advisory C there's always been a feeling that the island wanted to have some say about our own development."

Anxious to take control of its future, in 1991, the island elected the GIPAC to make recommendations for the island's land-use plan. But, t island residents, they aren't bad enough to make it one of the highest priority planning areas for Skagit County Commissioners. More than t is still waiting for action on its sub-area plan. And recently, the county informed the island that it won't have the funds to support the islanc process as part of the county's new comprehensive land-use plan for the foreseeable future.

"We weren't really surprised at that," says Businger. "We just said, 'Well, we'll do the work ourselves.'"

Starting this week, a team of architects, landscape architects, water specialists, energy engineers and transportation experts from around the island do just that. The experts were pulled together as a Sustainable Design Assessment Team (SDAT), a program of the AIA's Center for after Guemes Island was chosen as one of eight communities to receive technical assistance under the SDAT program in 2006. Through its SDAT team will help community residents and their planning committee create the blueprint that the island will then recommend as its sub-

commissioners. (For more information on the SDAT program, and for a list of the 2006 communities, see the SDAT section.)

"You are doing something that is rare in taking it upon yourselves to be involved in determining what you want your island to look like," sa Monk at the introductory meeting of the team and the community Tuesday (6/20) in the island's community hall. "Guemes Island has mov could become the model for sub-area planning in the county."

The SDAT program is based on the principle that environmental, social, cultural and economic systems are interconnected and are all esse sustainability, said Erica Gees, team leader for the Guemes Island project, AIA past president from Western Massachusetts and the preside England, at the opening meeting. In making sustainability the goal, disparate groups with widely varied opinions can discover common grou where they thought they could only disagree. "By everyone looking through the same pair of glasses and focusing on sustainability, we hav people together and build a solid consensus," she told the gathering of
some 100 community residents. "People can see that there are benefits for everyone in creating sustainable communities."

As a community that already understands sustainability issues, Guemes Island was a natural choice for the SDAT process, said Ann Livin Communities by Design. "In order to be approved for an SDAT a community has to have a basic understanding of sustainability and its ec and environmental components as well as the long-term time frame; the Guemes Island residents clearly understand the concept of sustaina working passionately to become more sustainable."

Guemes Island illustrated that in grand fashion Tuesday morning – in grand fashion for a rural island with only 800 residents. In a three-hou together for the assembled AIA experts, dozens of community residents showed off their energy efficient homes (some totally "off the grid' projects, sustainable ranches, successful small artists and other businesses, and open space and wetland preserves. Set among the natural r coastline, abundant wildlife, and tall trees, and blessed with a bright sunny day, the tour did its job.

"You have a wonderful island here," said team leader Gees. "You have entrepreneurship, creativity and problem solving."

Over the three days of the charrette process, the SDAT team and the community will work to hone its recommendations on six areas of cor island's planning committee:

- Water resources and the limited, sole-source aquifer
- Transportation issues and alternatives
- Preserving the sense of community and rural character
- Reducing energy consumption and dependency on non-renewable energy sources
- Maintaining the predominant scale of homes on the island, and
- Maintaining the quality and quantity of wildlife habitat in harmony with residential development.

The group started its work Tuesday afternoon, splitting into five roundtables of community members and experts who agreed to discuss the identify the community's goals and priorities. A public meeting on Tuesday night allowed all residents to come and express their opinions and the SDAT process. At the meeting, the experts promised to develop recommendations to help the community form their draft sub-area time, the experts warned residents that they needed to do some work as well, defining exactly why they are concerned about growth and the concerned about big houses" being built on the island? asked Walt Cudnohufsky, a landscape architect from Massachusetts. "You can't sta

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From:	Robert Pare
To:	PDS comments
Cc:	rwpare@seanet.com
Subject:	Comprehensive Plan 2016 Update
Date:	Sunday, April 10, 2016 4:52:08 PM

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1. Our names are Robert and Wendy Pare.
2. Our mailing address is 14114 Doser Street, Bow, WA 98232.
3. Comprehensive Plan 2016 Update is the subject of this email.

We support the addition of a Farmers Market at the Granary in Edison, Washington. This provides an opportunity to complement the existing businesses of Edison by attracting more people and enhancing their revenues. It will also provide a venue for our local farmers to sell their products locally to those in the community who do not want to use fossil fuel to go outside of their immediate area. Because the Granary is adding a parking lot to their facility, the vendors and shoppers will be able to park off the streets of Edison, eliminating any congestion in town. We ask that you allow the Granary to provide us with this new enhancement to our community.

Robert and Wendy Pare

Sent from my iPad

From: Pearson, Mark
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Thursday, April 14, 2016 7:30:42 AM

Hello Skagit County Planning Department Staff:

I support non-motorized transportation and trails for recreation, commuting, health, and the economy. The Skagit County Residence desire and deserve additional opportunity's to promote physical activity and well-being. The approval of the policies listed below will improve the health of the residence and improve the economic viability of the Skagit County.

Thank you for your time!

Mark Pearson, MS, MES, CSCS
Director
Certified Fitness and Wellness Center
Director
Trek for Treasure
United General District 304
2015 Hospital Dr Sedro Woolley, WA 98284
(360) 854-0247
www.unitedgeneral.org

Chapter 2, Urban, Land Use and Open Space Element

- *Policy 2A-6.2 Adopt plans, policies, codes and development standards that promote public health by increasing opportunities for residents to be more physically active. Such actions include: concentrating growth into Urban Growth Areas, promoting more compact urban development, allowing mixed-use developments, and adding pedestrian and non-motorized linkages where appropriate.*

- *Policy 2A-6.3 Concentrate facilities and services within Urban Growth Areas, using urban design principles, to make them desirable places to live, work, and play; increase the opportunities for walking and biking within the community; use existing infrastructure capacity more efficiently; and reduce the long-term costs of infrastructure maintenance.*
- *Policy 2B-1.3 Implement the adopted Skagit Countywide UGA Open Space Concept Plan to conserve open space areas, greenbelts and corridors within and between urban growth areas.*

  (a) Plan implementation should seek to protect lands useful for recreation, wildlife habitat, trails, and connection of critical areas, and working farm and forest lands.

Chapter 8: Transportation Element

- *Policy 8A-6.4 Provide for the diverse needs of bicycle, pedestrian and equestrian modes through appropriate routing and the utilization of single-use and shared-use facilities. Encourage public education for motorists and non-motorized users alike on the importance of "sharing the road," consistent with Traffic Safety policy 8A-10.3.*

- *Policy 8A-6.6 Coordinate system planning, funding, and development with other local, regional, state, federal and tribal jurisdictions; and with public transit providers, as most public transit trips begin and end with walking or biking.*

- *Policy 8A-6.11 Community and subarea plans should identify and address the implementation of pedestrian, bicycle and (where appropriate) equestrian facilities that provide safe, efficient and convenient access to residential neighborhoods, schools, parks and recreation facilities, commercial districts, activity centers, tourist areas and established or planned multi-use trails.*

- *Policy 8A-6.12 Emphasize maintenance of existing non-motorized facilities, including road sweeping, striping, signing, and debris removal, and the ongoing development of smooth and continuous road shoulders, including asphalt overlays or enhanced chip sealing where appropriate and feasible.*

The section entitled "RECOMMENDED TRAILS PLAN" notes that, " **Trails continue to be the most demanded recreational facility asked for by Skagit county residents.** The 2007 State Comprehensive Outdoor Recreation Planning (SCORP) surveys show similar trends. The (SCORP) document makes recommendations for local agencies and encourages trail opportunities. **The plan specifically states, "If there is a weakness in the local response statewide, it may be in addressing high-participation activities that take place away from a traditional park, especially bicycling and walking. Health professionals increasingly regard walking and bicycling, both for recreation and transportation, as valuable tools that can help people build healthier lifestyles. Community oriented trails, paths, and routes for walking and cycling can encourage people to participate in health oriented activities; encourage children to walk or bicycle to school; and encourage adults to commute without a car"**

For more information on how trails can benefit Skagit County, please view Cascade Bicycle Club's report, "The Benefits of Bicycle and Pedestrian Projects: Quantifying and Prioritizing Non-Motorized Transportation Investments" at https://issuu.com/cascadebicycleclub/docs/cascade-tptguide_2012/1

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From: Howard Pellett
To: PDS comments
Subject: Comments on the Proposed Comprehensive Plan 2016 Update
Date: Saturday, April 02, 2016 11:55:17 AM

Dear Skagit County:

Carol and I have been Guemes Island property owners since 1979 and residents and voters since 1995. I am President of the Guemes Island Property Owners Association and Carol is Board President of the Guemes Island Library. I am past head of the Green Party of Skagit County and President of Living Democracy-Skagit and have been involved in the effort to adopt a sub-area plan for Guemes Island for almost twenty years.

The Guemes Island Sub-Area Plan is the culmination of many years and many efforts to have the ongoing wishes of Guemes Islanders ratified and, in fact, was adopted by Skagit County over 5 years ago. It is long overdue for completion in order to keep faith with the community.

I support the recommendations of the Guemes Island Planning and Advisory Committee, specifically the proposed Guemes Island Zoning Overlay and codification of the Seawater Intrusion Policy. These thoughtful and fully discussed recommendations are needed to protect the island's rural character and avoid developments out of scale with existing homes.

It is also critically important that Guemes Island's sole-source aquifer be protected before excessive development precludes required protections. These requirements are an important first step although additional work must be done to protect the aquifer.

It will be wonderful to see the Guemes Islander's hard work fulfilled.

Regards,

Howard & Carol Pellett
5293 Guemes Island Road
Anacortes, WA 98221

360-293-8128

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Debra L. Nicholson

From: Timothy Manns <bctm@fidalgo.net>
Sent: Thursday, April 07, 2016 1:29 PM
To: PDS comments
Subject: Skagit Audubon Society comments on the Skagit County Comprehensive Plan 2016 Update

April 7, 2016

Skagit Audubon Society

Skagit County Planning Commission
c/o Skagit County Planning & Development Services
1800 Continental Place, Mount Vernon, WA 98273

Re: Comprehensive Plan 2016 Update

Dear Director Pernula and Planning Commission Members:

We are writing on behalf of Skagit Audubon Society to offer comments concerning the *Skagit County Comprehensive Plan 2016 – 2036* (March 4, 2016 draft). We would like to mention particular aspects of this update which we strongly support.

Skagit Audubon, the local chapter of National Audubon Society, is an all-volunteer, board-managed organization founded in 1982. By latest count our organization includes 224 member families, a number which continues to grow. The great majority of these members live in Skagit County.

We offer the following comments on particular parts of the Comprehensive Plan.

Envision Skagit 2060

We are happy to see that the revised introduction to the Comprehensive Plan includes (p.23) a section on the Envision Skagit 2060 project, whose recommendations we endorse. The State of Washington rightfully recognized this Envision Skagit with a 2012 Governor's Smart Communities Award for Excellence in Comprehensive Planning, correctly noting that its recommendations reinforce key goals, themes, and policies in the Skagit County Comprehensive Plan. That plan has evolved over 50 years of community planning in Skagit County involving a large number and broad base of county residents. Envision Skagit had a similarly large and broad involvement by citizens, and we support this effort to ensure Skagit County remains the kind of place we want it to be.

Implementing Skagit County's UGA Open Space Concept Plan

We note that *Policy 2B-1.3* of the Comprehensive Plan calls for implementing the Urban Growth Area Open Space Concept Plan completed in 2009. In a letter to Skagit County Planning and Development Services Department dated March 10, 2009, Skagit Audubon Society commented in support of this plan. We encourage our county government to move quickly towards implementing it.

Given Audubon's mission to conserve and restore natural ecosystems, focusing on birds, other wildlife and their habitats for the benefit of humanity and the earth's biological diversity, we are particularly interested in the related portions of the Open Space Concept Plan. Skagit Audubon Society strongly supports, for instance, provisions in any of the county's plans for preserving wildlife habitat and migration corridors. We believe that the Open Space Concept Plan has the potential to help achieve these preservation goals.

Skagit County has very significant and diverse wildlife values, many of which have been or will be adversely impacted by human population growth and related development and by climate change. Well-designed and maintained open space and corridors within and between Urban Growth Areas can help mitigate the effects of the habitat fragmentation that has already taken place and avoid further losses of significant habitat. Corridors can also provide a means for shifts in wildlife and native plant populations driven by climate change.

Wildlife and native plants add an important dimension to the quality of life in Skagit County and should rank high in any planning considerations. Additionally, Skagit Audubon has long had a popular weekly hiking program with many participants who use all the county's trails and are eager to see more developed. The benefits of this type of amenity for human health and also for enhancing an area's reputation and positively affecting real estate values are widely recognized.

Pedestrian and Non-motorized linkages and the Comprehensive Plan's Transportation Element

We are happy to see language in Chapter 2 (Urban, Land Use and Open Space Element) related to supporting human health by creating and maintaining opportunities for non-motorized activity. We note the existing *Policies 2A-6.2* and *2A-6.3* which remain in the updated plan. These call for pedestrian and non-motorized linkages, which will support the interests of many of our members as mentioned above.

Recognizing and adapting to climate change, protecting critical areas, and supporting conservation
We strongly support the Comprehensive Plan including in Chapter 5 (Environment Element) policies that recognize and encourage anticipation of the effects of climate change, from extreme weather events to increased sea level, and those policies which emphasize the importance of measures to preserve and restore anadromous fish species, and to protect areas of special importance for preserving biodiversity (*5A.5.3w*).

Non-motorized transportation in Chapter 8 (Transportation Element)
As stated in our organization's letter to the Skagit County Planning Commission dated Feb. 14, 2016, we strongly support the Comprehensive Plan's significant inclusion of policies supporting non-motorized transportation. Trails and pathways support healthy exercise, reduction in the use of fossil fuels, lessening of traffic congestion, and, potentially, the provision of secure corridors for the movement of wildlife such as migrating birds.

We strongly support inclusion in the Comprehensive Plan (Transportation Technical Appendix) of specific projects and plans for non-motorized transportation projects, such as the Centennial Trail and others. We note that public surveys leading up to the 2013 Skagit County Parks and Recreation Plan showed a strong interest in trails, which accords with Skagit Audubon's experience with the popularity of our hiking program. We are particularly interested in new trails and paths that also serve the purpose of preserving corridors for the movement of wildlife such as birds and other species. To ensure progress towards accomplishing the identified projects, we advocate adding an implementation plan with benchmarks to provide a measure of progress.

We note that page 70 of the Transportation Technical Appendix briefly addresses the concept of trails on dikes and levees. We strongly support our county government pursuing every opportunity to open public dikes to public recreational access.

Thank you for your attention to our interests in the planning work you are doing, which we very much appreciate.

If you have questions for us, please contact Conservation Chair Tim Manns at 360/336-8753 or conservation@skagitaudubon.org .

Sincerely,

/s/ Irene Perry

Irene Perry
President
Skagit Audubon Society

/s/ Timothy Manns

Timothy Manns
Conservation Chair
Skagit Audubon Society

From: Sally Peyou
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Thursday, April 14, 2016 1:16:41 PM

To Whom It May Concern,

As a resident of Guemes Island I write this in support of the comments made by GIPAC on the Comprehensive Plan 2016 Update.
I especially support the authorization of rainwater collection.

Sincerely,
Sally Peyou
7135 Upland Dr.
Anacortes (Guemes Island) WA

From: Gabe Philips
To: PDS comments
Subject: Multiyear Financing Plan for GMA Comprehensive Plan Transportation Elements
Date: Tuesday, April 12, 2016 3:43:45 PM

We have started reviewing transportation elements prior to the RTPO certification process and want to ensure your GMA comprehensive plans have the 20-year forecasts of all transportation revenues and needs, which serve as the basis for your 6-year TIPs. Attached to this message are a couple resources that may help you to develop your multiyear financing plan: (1) a spreadsheet we got from WSDOT reporting BARS data from 2000 – 2013 that includes Skagit County and cities-towns within the county; and (2) the Financial Assessment Appendix from the draft Skagit 2040 Regional Transportation Plan.

Kevin, Gabe and I would be happy to meet with you in the near future if you'd like to talk with us about how we did the financial forecasts, including the methodology and assumptions used, for the draft Skagit 2040 Regional Transportation Plan. Let me know if you'd like to meet soon and I'll work to set something up.

The applicable RCWs and WACs for this are:

36.70A.070(6)(a)(iv)

"(iv) Finance, including:

(A) An analysis of funding capability to judge needs against probable funding resources;

(B) A multiyear financing plan based on the needs identified in the comprehensive plan, the appropriate parts of which shall serve as the basis for the six-year street, road, or transit program required by RCW 35.77.010 for cities, RCW 36.81.121 for counties, and RCW 35.58.2795 for public transportation systems. The multiyear financing plan should be coordinated with the ten-year investment program developed by the office of financial management as required by RCW 47.05.030;

(C) If probable funding falls short of meeting identified needs, a discussion of how additional funding will be raised, or how land use assumptions will be reassessed to ensure that level of service standards will be met;"

WAC 365-196-430(2)(k)and (l)

"(k) Multiyear financing plan.

(i) RCW 36.70A.070 (6)(a)(iii)(B) requires that the transportation element include a multiyear financing plan based on the needs identified in the comprehensive plan, the appropriate parts of which develop a financing plan that addresses all identified transportation facilities and strategies throughout the twenty-year planning period. The identified needs shall serve as the basis for the six-year street, road, or transit program required by RCW35.77.010 for cities, RCW 36.81.121 for counties, and RCW 35.58.2795 for public transportation systems. The multiyear financing plan should reflect regional improvements identified in regional transportation plans required under chapter 47.80 RCW and be coordinated with the ten-year investment program developed by the Washington state department of transportation as required by RCW 47.05.030;

(ii) The horizon year for the multiyear plan should be the same as the time period for the travel forecast and identified needs. The financing plan should include cost estimates for new and enhanced locally owned roadway facilities including new or enhanced bicycle and pedestrian facilities to estimate the cost of future facilities and the ability of the local government to fund the improvements.

(iii) Sources of proposed funding may include:

(A) Federal or state funding.

(B) Local funding from taxes, bonds, or other sources.

(C) Developer contributions, which may include:

(I) Impact or mitigation fees assessed according to chapter 82.02 RCW, or the Local Transportation Act (chapter 39.92 RCW).

(II) Contributions or improvements required under SEPA (RCW 43.21C.060).

(III) Concurrency requirements implemented according to RCW 36.70A.070 (6)(b).

(D) Transportation benefit districts established under RCW 35.21.225 and chapter 36.73 RCW.

(iv) RCW 36.70A.070 (6)(a)(iv)(A) requires an analysis of funding capability to judge needs against probable funding resources. When considering the cost of new facilities, counties and cities should consider the cost of maintaining facilities in addition to the cost of their initial construction. Counties and cities should forecast projected funding capacities based on revenues that are reasonably expected to be available, under existing laws and ordinances, to carry out the plan. If the funding strategy relies on new or previously untapped sources of revenue, the financing plan should include a realistic estimate of new funding that will be supplied.

(l) Reassessment if probable funding falls short.

(i) RCW 36.70A.070 (6)(a)(iv)(C) requires reassessment if probable funding falls short of meeting identified needs. Counties and cities must discuss how additional funding will be raised or how land use assumptions will be reassessed to ensure that level of service standards will be met.

(ii) This review must take place, at a minimum, as part of the periodic review and update required in RCW 36.70A.130 (1) and (3), and as major changes are made to the transportation element.

(iii) If probable funding falls short of meeting identified needs, counties and cities have several choices. For example, they may choose to:

(A) Seek additional sources of funding for identified transportation improvements;

(B) Adjust level of service standards to reduce the number and cost of needed facilities;

(C) Revisit identified needs and use of transportation system management or transportation demand management strategies to reduce the need for new facilities; or

(D) Revise the land use element to shift future travel to areas with adequate capacity, to lower average trip length or to avoid the need for new facilities in undeveloped areas;

(E) If needed, adjustments should be made throughout the comprehensive plan to maintain consistency."

Gabe Philips
Transportation Planner
Skagit Council of Governments
(360) 416-6678
gabep@scog.net

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From: Maggie Potter
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Thursday, April 14, 2016 9:09:14 AM

I am commenting on the Transportation Plan part of the update. I think it is good and appreciate the work that hast been done on it. But I also think there needs to be benchmarks or implementation measures defined and included on the elements. This would provide a plan for implementation and a a measure of what is to be accomplished in the next six years and in the 20 year span this plan covers.

In addition, many are interested in a plan for accommodating non-motorized transportation (bike and pedestrian). Perhaps this could be done within the implementation of this plan.

Cheers

Maggie Potter
715 N 8th Street
Mount Vernon, WA 98273
360.428.7639

From: Lynn Prewitt
To: PDS comments
Subject: Skagit County 2016 Comprehensive Plan Update
Date: Thursday, April 14, 2016 9:40:35 AM

To: Skagit County Planning and Developmental Services

From: Lynn D. Prewitt
4929 Edens Road, Anacortes, WA 98221

Subject: Skagit County 2016 Comprehensive Plan Update

I am writing in support of the two proposals critical to the implementation of the Guemes Island Sub-Area Plan:

1) A new zoning overlay for the island to avoid new buildings that are out of scale with the existing/historical scale of the island; to keep views open; and protect the rural character of the island; and

2) The Seawater Intrusion Policy proposed for codification in the Critical Areas Ordinance which addresses the need to protect Guemes Island's precious groundwater and sole source aquifer.

Sincerely,
Lynn D. Prewitt

From:	Kit Rawson
To:	PDS comments
Subject:	Comment of Kit Rawson, 3601 Carol Place, Mount Vernon, WA, on Comprehensive Plan 2016 Update
Date:	Tuesday, April 12, 2016 4:27:10 PM

Commentor:
Kit Rawson
3601 Carol Place
Mount Vernon, WA 98273

RE: Comprehensive Plan 2016 Update

I am writing to comment on the proposed Comprehensive Plan 2016 Update, as published online March 3, 2016. This comment focuses on transportation, although transportation is addressed in a number of different plan elements.

I live in unincorporated Skagit County, withing the Mount Vernon urban growth area, just outside the Mount Vernon city limits, near the intersection of Swan and Francis Roads. My wife and I have lived in Mount Vernon since 1988. We raised our two children here.

I am pleased to see that the proposed plan addresses the diverse needs of bicycle and pedestrian users of the transportation system. I agree that the County should encourage and promote public education for all uses on sharing the road. However, the plan needs to set actual benchmarks or implementation measures to be sure that these and other elements of the plan occur during the life of the plan.

I rely on the county transportation system for shopping, work (I am retired from full-time work but am a part-time self-employed fisheries consultant with clients in Skagit County and elsewhere), to visit family, to travel to meetings of several volunteer boards and committees, and to access recreation. I use the full gamut of transportation modes available: Skagit Transit, the Washington State Ferries, Amtrak, riding a bicycle, walking, and driving a personal vehicle. One of the great amenities of living in Skagit County is that we can employ this variety of transportation modes to get where we need to go in our daily lives. I would like to see Skagit County continue to support a multimodal transportation system that provides options and accessibility to safe transportation to the greatest number of citizens and visitors (who are usually customers, family or friends of County citizens). If done correctly, this kind of transportation system can provide great benefits in mobility with efficient use of taxpayer dollars as well as minimizing the environmental impacts and increasing human health benefits.

The proposed plan includes a number of features that show that Skagit County is on track to supporting a multimodal transportation system that will provide the above benefits. In Chapter 2, Urban Land Use and Open Space Element, policies 2A-6.2, 2A-6.3, and 2B-1.3 (proposed new language) are good underpinnings for the right kind of transportation system. In Chapter 8. Transportation Element, new or revised policies 8A-6.4, 8A-6.6, 8A-6.11, and 8A-6.12, as well as several paragraphs of new narrative regarding non-motorized transportation in the Profile section and the revised Appendix C, are all key to an effective comprehensive multi-modal transportation plan. I support all of these policies and new language.

However, while the proposed plan does include this excellent list of good intentions and guidance, it is bereft of specifics regarding how the non-motorized elements will actually be implemented. These non-motorized elements are key to an effective multi-model plan, and good intentions for them are not enough to make them actually happen. The plan also needs benchmarks for the six years of the plan and a general strategy for what will be implemented in the 20 years that the plan is looking ahead to.

I urge the County to form a volunteer citizens task force to develop a master bicycle and pedestrian plan. The task force would develop and prioritize projects using expertise of residents who have experience using these facilities and the need for them. I would be willing to serve on that committee and to support the development of such an implementation plan in any other way that would be helpful.

Skagit County is a destination for recreation and offers many amenities for both residents and visitors. I have traveled by bicycle through Skagit County, Washington, many areas of the United States, and through many countries in Europe. I have observed that communities that provide services and infrastructure to visitors, including bicyclists, often appear more prosperous than neighboring communities without these amenities. The County has the opportunity to provide connections between cities on County roads that would make our area much more accessible and enjoyable for bicycle travel as well as providing economic, environmental, and health benefits for Skagit County citizens.

-- Kit Rawson
Mount Vernon
April 12, 2016

From: Rich
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Friday, March 11, 2016 5:12:18 PM

On 10/28/2015 I wrote the following and I stand by my comments still.

I am all for this Proposal for adding "Raspberry Ridge" into the Burlington Urban Growth area, However I see no need to include my property in with it (P62681), and after talking with the planning dept in Burlington I don't believe the city of Burlington wants it there either.

Raspberry ridge should have never been built in this area to start with, but that's a different problem, when it was built It should have been put on the city sewer system at that time. The failures of it's septic system have caused smells in the neighborhood, and I wonder if that system is leaching into the ground water and the Skagit River.

My property P62681 is low laying and I do not intend to develop it at any time, Developing it would be a nightmare, and I don't think the county would give me a permit to build there without building the property up 12 feet as I believe they had to do for Raspberry Ridge, and I certainly hope that if the neighboring Property to the north of me would not be able to develop either. That would flood my property. In the rainy season there is no standing water but the ground is very soggy, soggy enough that if I drive a vehicle out there I will get it stuck.

I believe there is a misprint on the flyer you send out, according to it my neighbor to the north has a parcel that is 92.1 acres? Maybe 2.1 acres

My property is presently zoned as agricultural and eventually I would like to raise a cow and maybe some chickens out there. I have a shop building and several fruit trees growing on the property at this time.

I do live on the adjoining lot within the city of Burlington.

Please do not include my property into this proposal.

Richard Rohweder
1904 Sunset Drive
Burlington, WA 98233
(360) 707-2049

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PDS

April 5, 2016

Comments to Skagit County Planning Commission re 2016 Comp Plan Update

Good evening. My name is Hal Rooks and I am speaking as a member of the Guemes Island Planning & Advisory Committee (GIPAC).

I want to give you a little context for why we are so focused on protecting the ground water of the island. Ground water from an aquifer is the only source of fresh water available to the large majority of residents on Guemes. There are no rivers or surface water on the island. Wells provide water to nearly all the island's residents, and those wells draw from the aquifer.

Seawater intrusion along some of the more densely populated coastal areas of Guemes has been documented since the late 1970's. Chloride levels in well water have been elevated (greater than 100 mg/L) around West Beach, North Beach, and in the west-central part of the island since the early 1990s.

In 1997, the federal Environmental Protection Agency designated the island's aquifer system as a "Sole Source Aquifer" under the Federal Safe Drinking Water Act. All of Guemes Island also has been designated as a Category I Aquifer Recharge Area. This designation reflects the need to provide special protection to the entire island because the County, State, or Federal Government has determined the aquifer needs protection from future land use that poses a risk to the quality or quantity of the aquifer (SCC 14.24.310 (1) (a)).

We are therefore pleased to **support the proposed Seawater Intrusion Areas Section** 14.24.380 in the Critical Areas Ordinance (CAO). Incorporating and codifying the previous Interim Seawater Intrusion Policy into the CAO was a priority recommendation in the Guemes Sub-Area Plan.

Specifically, GIPAC supports the County's **lowered pumping rates** for wells (Table 14.24.380-1); the proposed code language for **reverse osmosis systems** (Title 14.24.380(3)(b)); and the proposed requirement that **well drillers install a meter on new and existing wells** (Title 14.24.380(4)(a)(i)).

Water meters are very useful in promoting voluntary water conservation and enabling property owners to identify leaks that could adversely affect the aquifer. <u>In Public Water Systems where more than two homes are served by a well, we support requiring meters on each service connection, in addition to metering the wellhead</u>.

We understand that additional work is needed to address critical groundwater issues on Guemes Island, beyond that which County can tackle with the 2016 Comprehensive Plan Update. Specially, giving **preference to rainwater collection systems and discouraging new wells is a top priority** for Guemes Island. Therefore, GIPAC is pleased to see the County expressing its intent to

encourage alternatives to wells in areas of known seawater intrusion (in Title 14.24.380(3)(a)). We would also like to see the definition of adequate water supply reduced from 350 gallons/day to 150 g/d in SCC 12.48.030, because this would make rainwater collection systems less expensive and more feasible on many small lots.

In closing, GIPAC believes SCC 12.48 should be revised as soon as possible, and we would like the County to commit to a timetable for this work in the second half of 2016. We stand ready to work collaboratively with the County in this effort.

Thank you for considering our comments.

Hal Rooks
1219 10th St.
Anacortes, WA. 98221

From: Hal Rooks
To: PDS comments
Subject: Skagit County 2016 Comprehensive Plan Update
Date: Wednesday, April 13, 2016 3:34:41 PM

On behalf of the Guemes Island Planning & Advisory Committee, I am submitting the following comments on Skagit County 2016 Comprehensive Plan Update.

Hal Rooks
1219 10th St.
Anacortes, WA. 98221

Guemes Island Planning and Advisory Committee
April 13, 2016

Skagit County Planning and Development Services
1800 Continental Place
Mount Vernon, WA 98273

Re: Skagit County 2016 Comprehensive Plan Update

Dear Skagit County Planning and Development Services:

At the April 5 hearing before the Skagit County Planning Commission, Guemes Island property owner Mark Madden objected to the proposed SCC 14.16.360 of the 2016 Comprehensive Plan Update. The Guemes Island Planning and Advisory Committee (GIPAC) would like to correct some of Mr. Madden's assertions and clarify the process and reasoning for the setback and height regulations in the building envelope of the proposed Guemes Zoning Overlay.

Overview

White settlers first came to homestead on Guemes Island in the 1860s, sharing the island with the Samish tribe. With the settlers came the first schoolhouse (1873) and the platting of land. As ferry service became established (1890), along with telephone service (1908), rural mail delivery (after 1912), and electricity (1949), population increased. In 1908, 100 families lived on Guemes; by 1960, the population was 216. Many small plats of land were established along the Guemes shores for summer camping sites and small summer cottages for people who lived in the "metropolis" of Anacortes. The population on Guemes Island continues to expand during the summer; currently our full-time population of 667 residents (according to the 2010 census) triples every summer.

As people discover the beauty of our small rural island, they are attracted to live here on lots that were platted long before the Growth Management Act and the establishment of rural zoning—lots that were never planned for permanent residences. Though the Rural Intermediate zone, which is the smallest residential zone allowed on Guemes, limits lot size to 2.5 acres, 344 of the 352 shoreline lots in the Rural Intermediate zone on the island are substandard-sized lots. Many of them are only 50 feet wide.

Public Participation

In 1991, a year after the Growth Management Act was established in Washington, the citizens of Guemes elected the first GIPAC to begin planning for subarea guidelines. Skagit County didn't have a Comprehensive Plan ready. In 2002, a new GIPAC was elected at a public meeting to draft a Subarea Plan, which was finally adopted by the Board of Commissioners in January 2011.

During that time, numerous public meetings were held. In 2004, 60 community members attended a public workshop to complete a visual planning survey. Respondents preferred images of smaller roads, single-family houses set back from public streets, small-scale commercial land uses, scenic open spaces, and farmland with traditional structures. That same year, a written survey was mailed to about 800 Guemes households; 46 percent of the households responded. One question asked respondents to rate the importance of individual property rights and the community's right to preserve its character on a scale of 1 to 10, with 10 being the most important. Fifty-six percent of the respondents marked 8–10 for the preservation of character; nine percent marked 1–3. In 2005, a public meeting was well attended to hear the results of a Rapid Shoreline Inventory of 6.45 miles of Guemes shores. The results of the inventory built knowledge and understanding of the importance of shoreline features that support marine life, and pointed at areas of concern. In 2006, about 200 people attended a three-day workshop facilitated by a Sustainable Design Assessment Team from the American Institute of Architects. The issues, conclusions, and recommendations discussed in the final report validated the path the island community wishes to follow and upheld the objectives of the Subarea Plan.

The draft of the Subarea Plan and the final adopted version were published on the island's online website LineTime.org. The final version is still readily available there. Following the adoption of the plan in 2011, the *Guemes Tide*, the island's community newspaper that was distributed monthly to about 600 households, ran a six-part series throughout 2012 that described and summarized all of the Subarea Plan recommendations.

GIPAC members are elected each year by the public, and GIPAC serves in accordance with RCW 36.70.060.070, which governs the actions of planning advisory committees. All GIPAC meetings are open to the public and advertised monthly on LineTime and in the *Guemes Tide*. The minutes of every GIPAC meeting are posted on LineTime. Mr. Madden attended two recent GIPAC meetings to discuss his concerns.

Future Development Pressure

In the five years that have passed since the adoption of the Guemes Island Subarea Plan, a number of houses have been built that do not comply with the recommended Guemes Zoning Overlay (SCC 14.16.360) that is being proposed for the 2016 Comprehensive Plan Update. One of those recently built, out-of-scale homes—a 2,344-square-foot, two-story home with a 1,408-square-foot garage that was built in 2012 on a 50-foot-wide, 0.45-acre lot—is directly north of Mr. Madden's modest home. Almost three quarters of Indian Village remains small-scaled, as is shown in the following photograph:

Mr. Madden's home, marked with the arrow, is in scale with the majority of Indian Village, but is encroached upon by four oversized homes, as illustrated in the following photo:

Mr. Madden is correct in describing other Guemes shoreline communities that risk pressure for out-of-scale homes. The following is a photo of North Beach, which has moderate-sized homes:

But sections of West Beach are experiencing the same kind of out-of-scale home-building that is occurring in Indian Village, as seen in the following photo:

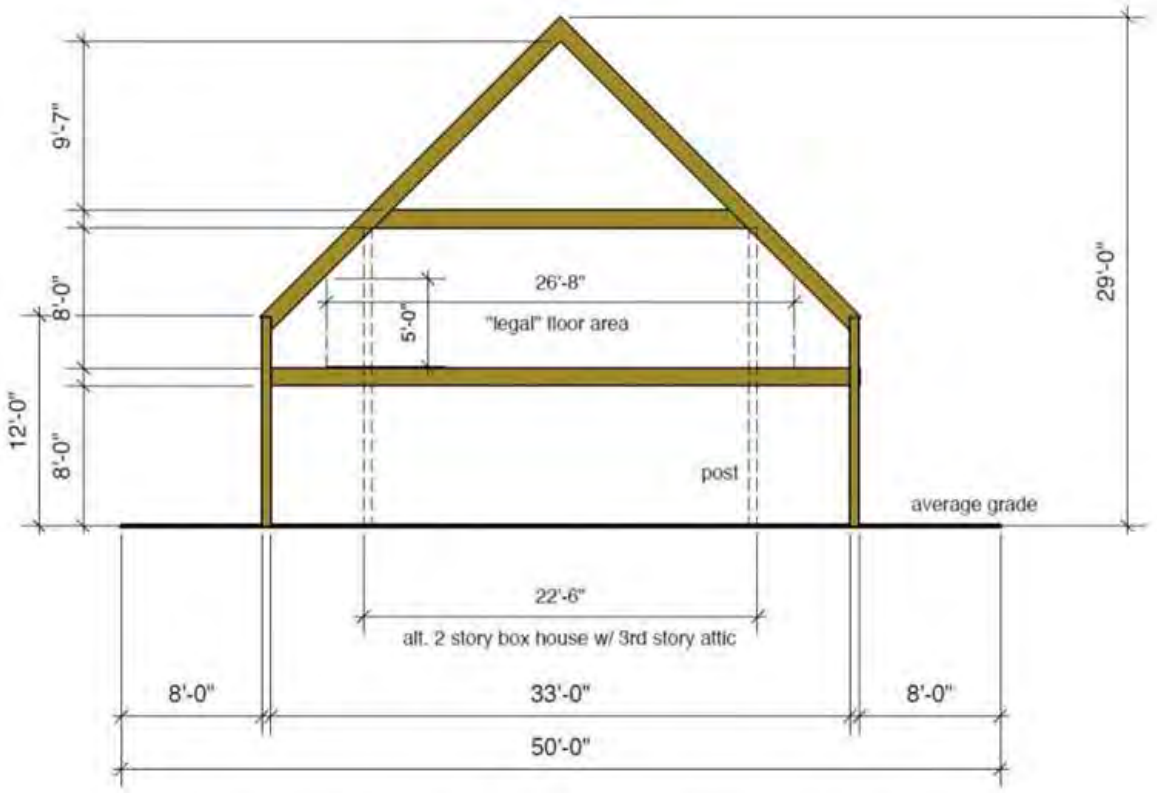
The AIA study identified that, in 2006, 70 percent of shoreline property on Guemes Island was owned by senior citizens. In the subsequent 10 years, that number has increased. In the next 25 years, there will be a huge transfer of ownership of Guemes shoreline properties, with resulting pressure to remodel and rebuild, especially in a rural area that is so close and accessible to the urban growth areas of Anacortes and greater Seattle. In addition, under current zoning regulations, about 830 new homes could be built on vacant lots on the island.

In order to protect the community's character and to prevent further deterioration of existing shoreline wells and the depletion of the island's sole-source aquifer, it is imperative to prevent out-of-scale building, which is why the Guemes Zoning Overlay is being proposed and is supported by so much of the Guemes community.

SCC 14.16.360 would *prevent* hardships in Indian Village by keeping any future homes in scale rather than encroaching on existing appropriately scaled homes.

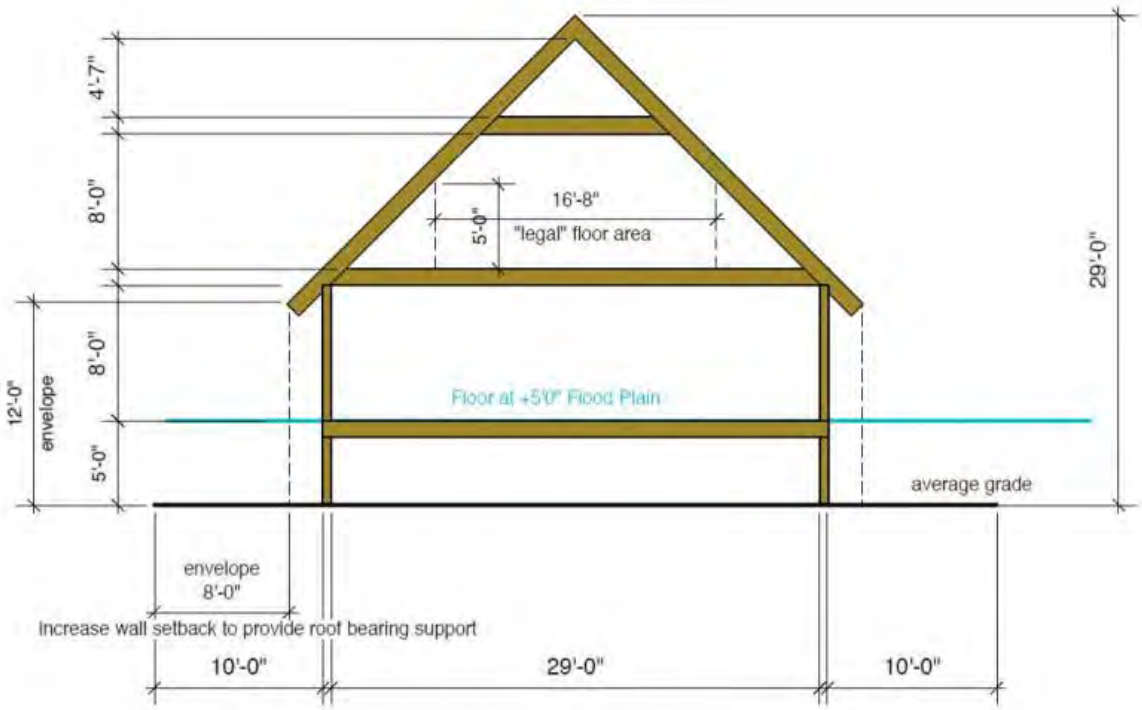
Good Design

Mr. Madden's assertions that he cannot have an open-concept home or a great room in his remodeled house, that second-level rooms require first-level load-bearing walls, and that a second-level master bedroom could only be 14 feet wide are inaccurate, and ignore many good design options such as post-and-beam construction and the use of trusses rather than load-bearing walls. There would be no restriction on roof overhang on the front and back of the house, and roof overhang on the sides may penetrate 30 percent of the side setback area (2.4 feet into an 8-foot setback or 3 feet into a 10-foot setback). Gary Curtis, member emeritus of GIPAC and a structural engineer who helped design the Seattle Space Needle, supplies the following two elementary examples of designs that use the maximum limit of the building envelope. The first one would be for a two-story, 33-foot-wide home with 8-foot ceilings at grade level—with an option for a two-story box house with a third-story attic:



Proposed Envelope with 50' Minimum Lot Size

The second design would be for a home with a floor level that is 5 feet above grade, as may be required for homes that are in the flood plain. By increasing the side setbacks by 2 feet, this design provides for a two-story building with 8-foot ceilings and a 29-foot width and height:



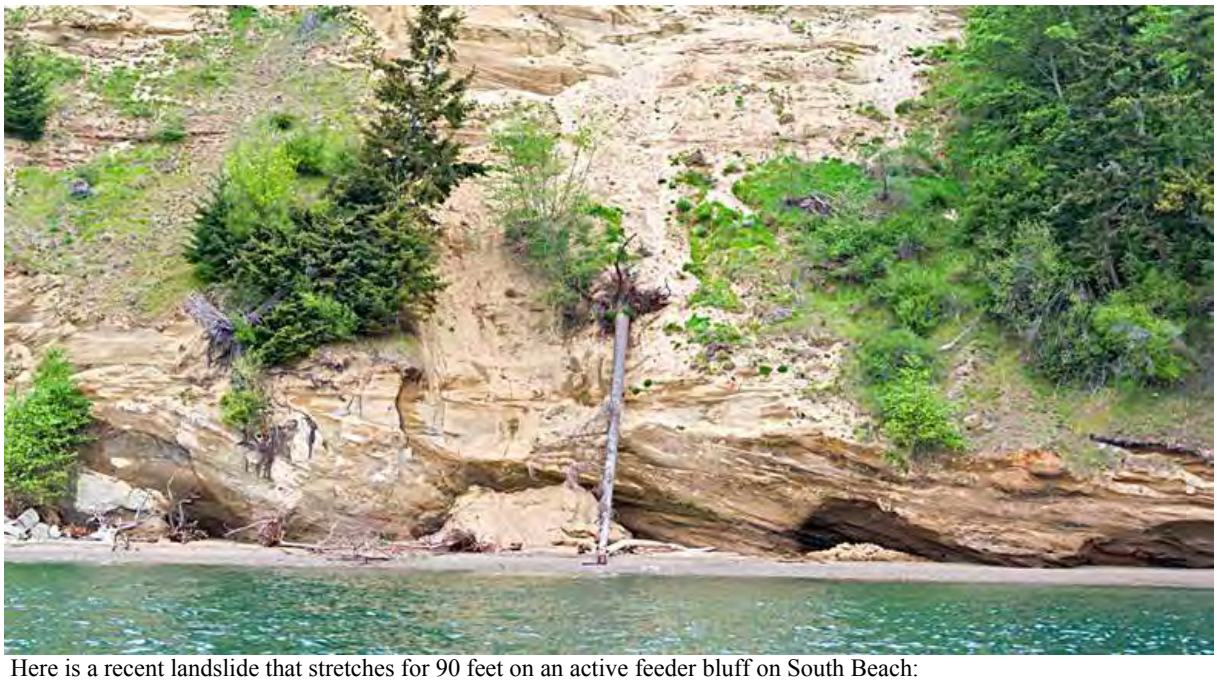
Proposed Envelope with 50' Minimum Lot Size
and with 5' 0" Flood Plain

Based on these sketches, we believe that good designs are possible that would satisfy Mr. Madden's desire for an attractive and unique home that maximizes western views and recreational areas and fits within the proposed envelope.
While we do not endorse variances out of hand, we recognize that there are occasions when one may be appropriate to apply to an individual environment such as Mr. Madden's and his neighbors.

Floods, Bluffs, and Tsunamis

Caution should also be applied in development standards for Guemes's shoreline properties due to impending natural causes. Predicted sea rise will endanger more and more homes that are built on low-bank shorelines. A number of homes are built on active feeder bluffs that are eroding rapidly—as much as a foot or more per year. The following photo is of homes built on an active feeder bluff on West Beach. Note the fallen tree, bare slope, and how the bluff is severely undercut at the water's edge.

The photo below magnifies the section of the above photo where the arrow points:



Here is a recent landslide that stretches for 90 feet on an active feeder bluff on South Beach:

When the Cascadia Subduction Zone earthquake eventually strikes, the NOAA Center for Tsunami Research predicts a tsunami that could bring waves of over six feet along many of the shores of Guemes.

Conclusion

We again ask the Planning Commission to adopt the recommendations of the Guemes Island Subarea Plan that are endorsed by the Planning and Development Services Department. The Seawater Intrusion Policy will protect our scarce water resources; the Guemes Zoning Overlay will protect the rural character of the island, help prevent the overuse of the island's sole-source aquifer, and will moderate growth to an appropriate and manageable scale.

Sincerely,

Nancy Fox, Chair, GIPAC
Allen Bush, Vice-Chair, GIPAC
Hal Rooks, Treasurer, GIPAC
Patty Rose, Secretary, GIPAC
Gary Curtis, Emeritus GIPAC member
Michael Brown, GIPAC member
Steve Orsini, GIPAC member
Stella Spring, GIPAC member

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Western Washington Agricultural Association

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April 14, 2016

Mr. Dale Pernula, Director
Skagit County Planning and Development Services
1800 Continental Place
Mount Vernon, WA 98273

RE: Comprehensive Plan 2016 Update- Skagit County Transportation Element Technical Appendix

Dear Mr. Pernula:

Western Washington Agricultural Association appreciates the opportunity to comment on Skagit County's Notice of Availability Comment Period for Skagit County Comprehensive Plan 2016 Update.

Within Skagit County's 2016-36 Comprehensive Plan, Transportation Technical Appendix multiple types of projects proposals look to provide additional multimodal trails, paths, and corridors throughout the rural landscape. While many of these proposed projects are planned within existing Skagit County easements, some appear as though they would utilize private agricultural land, border farm and ranch land, and/or overlay existing drainage and irrigation district easements and infrastructure. Skagit County agricultural landowners and businesses are proud of their operations, techniques, and products, and appreciate the public interest and pleasure surrounding their industry. However, some of these projects are too close, and create a high likelihood for conflict between farmers and public, and may impact critical infrastructure and processes.

The "Tiger Trail Project" poses the highest risk of negative interaction and interference with agricultural operations. This project alone, with an estimated cost of $8.9 million, will consume approximately 85 acres of agricultural land and infrastructure. While this property is not classified as "private" agricultural land, but rather as Puget Sound Energy ownership and/or easement, a case for adverse possession can be made through the lack of "interest" in this land by the listed owner. Additionally, utilizing this land to create a developed trail does not appear to fit the intended or listed purpose for this ownership, and further would disrupt current agricultural operations along its entire length.

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• (360) 424-PEAS (7327) • FAX (360) 424-9343
E-mail: info@westag.org

In addition to private agricultural operations, Skagit County Drainage and Irrigation District Nos. 14 and 16 actively and routinely maintain their easements along the reach of this proposed project. This vital infrastructure, which provides agricultural drainage and additional road runoff along Chuckanut Drive, cannot be altered, changed and/or abandoned without significant cost and detriment to adjacent and peripheral landowners. Additionally, without adequate modeling, it is impossible to identify and predict what additional effects altering this watercourse would do to up and downstream water movement if it were modified.

Many agricultural operations, procedures, and functions have a high likelihood of impact with construction of the "Tiger Trail Project" and other listed and proposed projects within the Transportation Technical Appendix. As Skagit County continues to provide connectivity and corridors for non-motorized traffic, particularly through agricultural and rural land, please consider more closely working with private landowners and businesses, and drainage and irrigation districts prior to, and during planning of these projects.

Farmland is a scenic and historic aspect of Skagit County's land base, that can and should be enjoyed by the viewing public. However, unintended conflict and negative reactions are likely outcomes when those not familiar with local agricultural practices and infrastructure come in close contact with farm operations and know not how to behave and/or understand what they see. As Skagit County attempts to provide both close access and corridors through farmland, analysis and coordination are necessary steps prior to plan finalization and project construction to identify and minimize unintended consequences with these interactions.

If you have any questions or need further information with regard to our comments, please contact me at your convenience, 360-424-7327, or broozen@westag.org.

Sincerely,

Brandon Roozen
Executive Director

Comments for Comprehensive Plan Update

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Hello. My name is Patty Rose. I am a member of the Guemes Island Planning and Advisory Committee, or GIPAC. My husband and I own property on North Beach, at 4829 Guemes Island Road. I would like to begin with sincere thanks on behalf of GIPAC to the Planning Commissioners and Skagit County staff for engaging with us on issues of great importance to our small island community.

Guemes Islanders are somewhat isolated, we share a remarkably unspoiled shoreline which provides critical wildlife habitat, we literally rely on each other for our supply of water and we share the rural heritage of Guemes.

Our presence here tonight is another step in a story of intense citizen involvement which began over 20 years ago. The Guemes Sub-Area plan was begun in 1991 and approved by the Skagit County Board of Commissioners in early 2011. During all of those years GIPAC had assistance from other island organizations as well as People for Puget Sound, the NW Straits Foundation and the American Institute of Architects. The purpose of the plan is to allow growth that will conserve the islands' groundwater resources, rural character and sense of community.

The current mission of GIPAC is to bring the vision set forth in the Guemes Island Plan to reality. Our two approaches are public education and working with you all, the policy makers of Skagit County, to convert community plan into county requirements wherever possible. We GIPAC members are here tonight to express our support for the proposed Guemes Island Zoning Overlay and the new Seawater Intrusion section of the Critical Areas Ordinance. These proposals flow directly from the Guemes Plan. GIPAC has also submitted broader written comments.

A personal note: when my husband and I bought our island property, there was an existing well with some seawater intrusion and we were dimly aware that there were water issues on the island. We wish we had made different choices when we built. If an alternative water supply system, such as rainwater catchment or reverse osmosis from sea water had been a preferred option for new development on North Beach, we likely would have a more sustainable system today.

To close, our community has waited a long time for implementation of its Sub-Area plan. We urge the Commissioners to support us and act quickly to enact these proposals. Thank you.

Patty Rose
4829 Guemes Island Road
April 5, 2016

From: Barbara Schnabel
To: PDS comments
Subject: Comprehensive Plan Update
Date: Tuesday, April 12, 2016 8:35:59 PM

To Whom It May Concern:

I am writing in support of a non-motorized trail on Guemes Island Road from School House Park to the Guemes ferry dock. I frequently walk from my home on South Shore Drive to events at the Community Hall. Often trips are after dark. There is quite a bit of traffic on Guemes Island Road, including people going to or coming from the ferry. I carry a flashlight and I wear protective clothing, but I would certainly feel safer if there were a designated trail on Guemes Island Road.

Thank you.

Yours truly,
Barbara Schnabel
5270 South Shore Drive
Anacortes, WA. 98221

From:	David Sherman
To:	PDS comments
Subject:	Comprehensive Plan 2016 Update
Date:	Thursday, April 07, 2016 8:54:27 AM

Comments on Proposed "Comprehensive Plan 2026 Update"
Planning and Development Services
1800 Continental Place
Mount Vernon, WA 98273

April 7, 2016

Owner:
Valley High Investments, Inc.
41 N.E. Midway Blvd, Ste. 101
Oak Harbor, WA 98277

Authorized Representative (Agent):
David Sherman, DBA-Island Associated, LLC
P.O. Box 911
Oak Harbor, WA 98277
Email: dsherman4@live.com

Subject: Comprehensive Plan 2016 Update
Public Comment

To: Skagit County Planning Commission,

Valley High Investments, Inc. is a major property owner contiguous to the North boundary of the city limits; 20 plus acres.

We are writing in support of the City of Sedro-Wooley's application and position, specifically; to add enough land to the Sedro-Woolley urban growth area to accommodate the projected employment growth and population growth over the 20-year planning horizon.

Our property is adjacent to the north boundary of the city limits, out of the flood plain, just north of a newly built City fire station, and with-in 100' of all utilities. The few arterials in this northern area, connect to thoroughfare SR-9, which also connects to thoroughfare SR20, then to Interstate I-5.

Regards,
Island Associates, LLC

David Sherman

Sent from Mail for Windows 10

ISLAND
ASSOCIATES, LLC
P.O. Box 911
Oak Harbor, WA 98277
360-675-6800 FAX: 360-675-6881

RECEIVED
APR 11 2016
SKAGIT COUNTY

Comments on Proposed "Comprehensive Plan 2026 Update"
Planning and Development Services
1800 Continental Place
Mount Vernon, WA 98273

April 7, 2016

Owner:
Valley High Investments, Inc.
41 N.E. Midway Blvd, Ste. 101
Oak Harbor, WA 98277

Authorized Representative (Agent):
David Sherman, DBA-Island Associated, LLC
P.O. Box 911
Oak Harbor, WA 98277

Subject: Comprehensive Plan 2016 Update
Public Comment

To: Skagit County Planning Commission,

Valley High Investments, Inc. is a major property owner contiguous to the North boundary of the city limits; 20 plus acres. See attached Mapping.

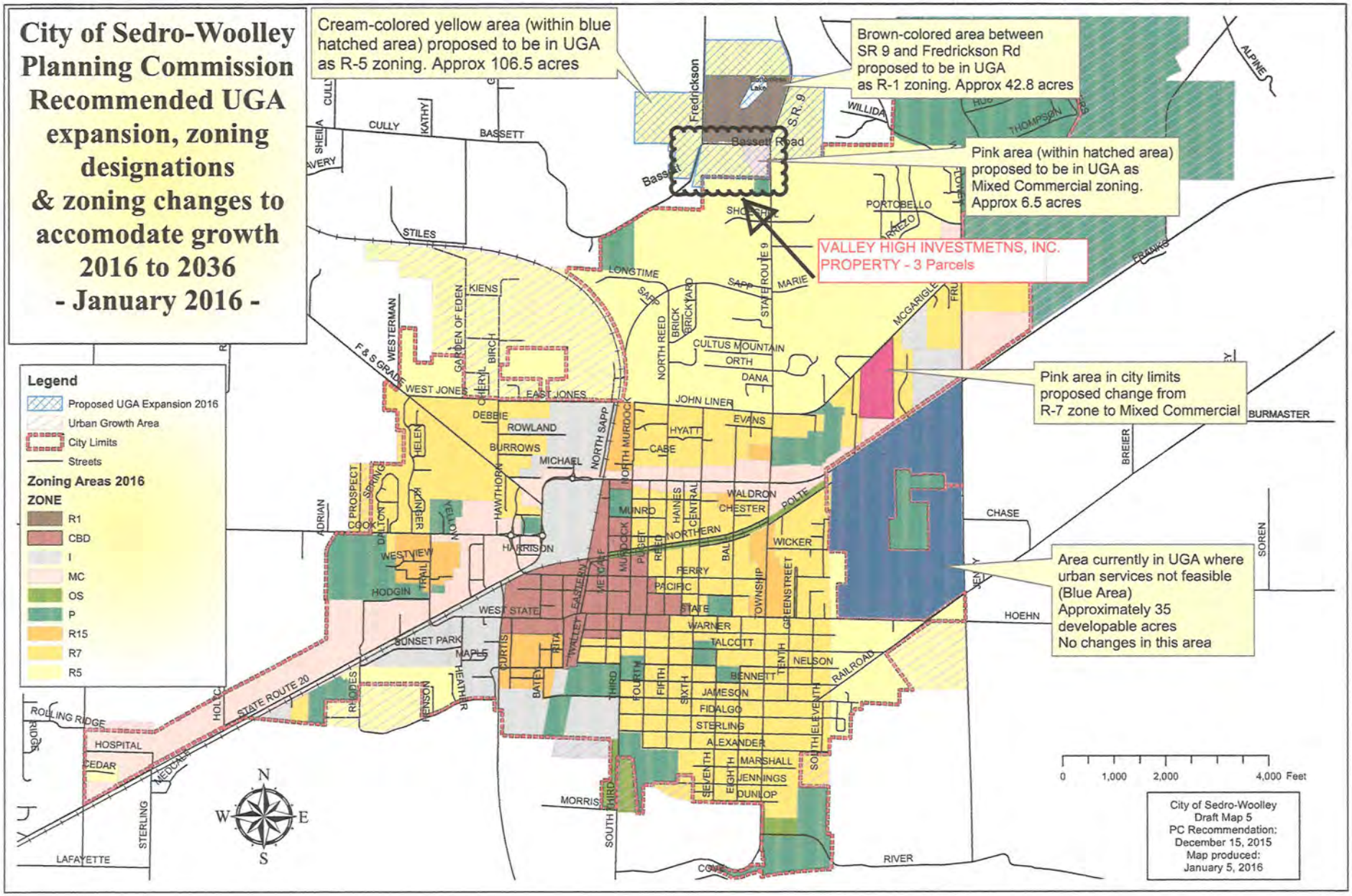
We are writing in support of the City of Sedro-Wooley's application and position, specifically; to add enough land to the Sedro-Woolley urban growth area to accommodate the projected employment growth and population growth over the 20-year planning horizon.

Our property is adjacent to the north boundary of the city limits, out of the flood plain, just north of a newly built City fire station, and with-in 100' of all utilities. The few arterials in this northern area, connect to thoroughfare SR-9, which also connects to thoroughfare SR20, then to Interstate I-5.

Regards,

David Sherman
Island Associates, LLC

City of Sedro-Woolley Planning Commission Recommended UGA expansion, zoning designations & zoning changes to accomodate growth 2016 to 2036 - January 2016 -



From: Alger Watershed
To: PDS comments
Subject: Ed Stauffer, Box 114 Bow,Wa. 98223 Comprehensive Plan Update testimony
Date: Thursday, April 14, 2016 4:05:31 PM

April 14, 2016

Dear Planning Commissioners:

In the interest of reduction of paperwork, I again suggest you review the documents I previously referenced in my written testimony on the Shoreline Master Plan "update" which you are also deliberating at this time. These references background the Rural Community as they are viewed by the State Advisory Agency providing us with the "guidelines". To this I would only add the request that you read Growth Management Act RCW36.70.A.011 **findings, Rural Lands.** If you then do not find yourself conversant with the legacy of Skagit County Rural Community policy, I would recommend you either

(a) move for additional time and resources to fully appreciate the gravity of the issues being addressed, or
(b) abstention from endorsement or rejection, for cause.

You have been asked by the Board of County Commissioners, as paraphrased by staff, to carry a heavy load on this project. Without the work normally done by a Citizen Advisory Committee, you must become conversant with a huge amount of material with little advance notice or opportunity to research or dialog. I hope you will soon examine your by-laws, and correct this problem.

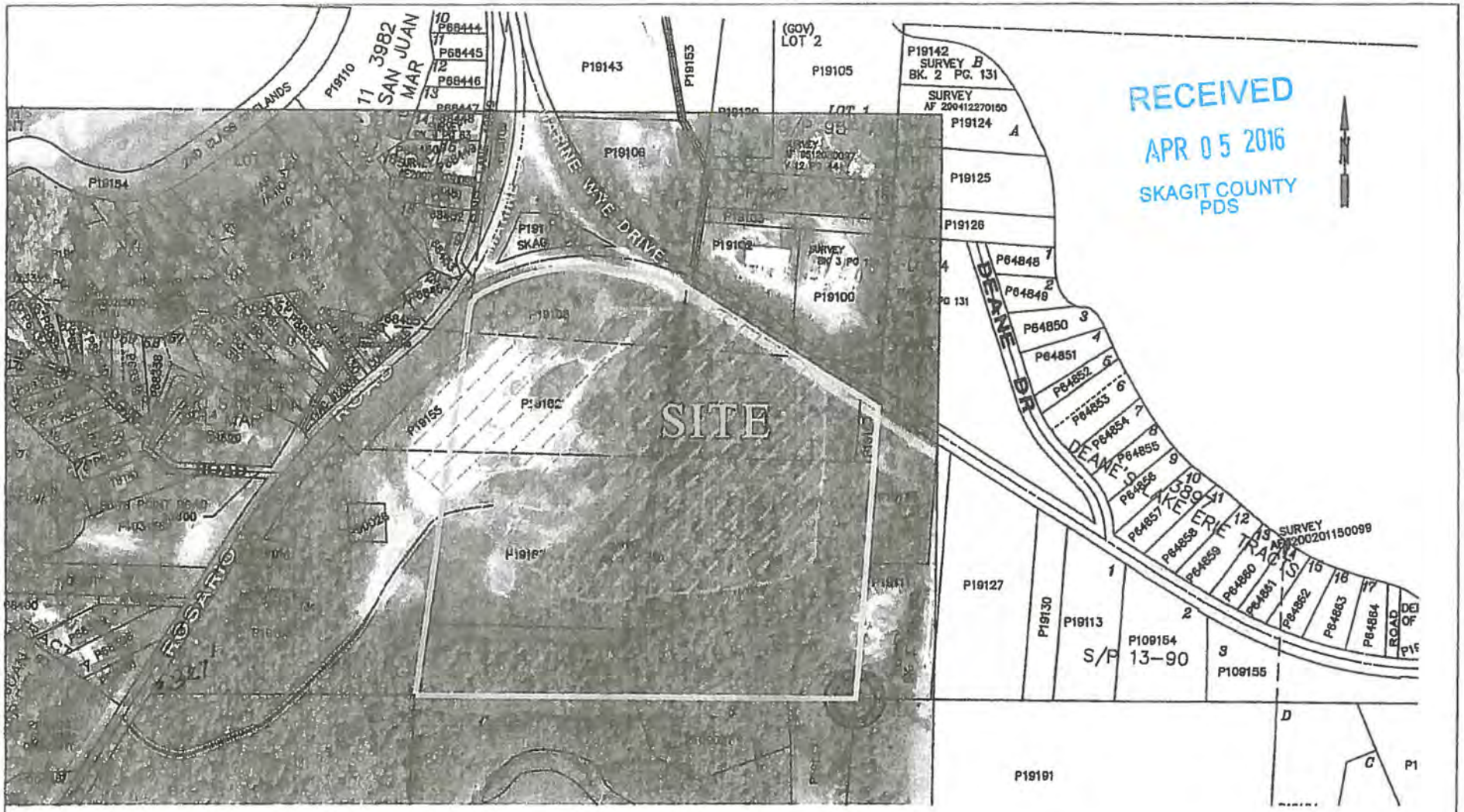
Thank you for your civic service. Ed Stauffer

From: Lorrie Steele
To: PDS comments
Subject: Skagit Co. 2016 Comprehensive Plan Update
Date: Tuesday, April 05, 2016 12:55:55 PM

--- On Fri, 4/1/16, Guemes Ferry Trail <guemesferrytrail@gmail.com> wrote:

> My name is: Lorrie Steele
> My address is: 5521 No Name Road, Guemes Is.
> Anacortes, Wa. 98221
> I've lived on Guemes Island for 37 years.
> I've served on the Guemes Island Community Council, as a
> volunteer
> firefighter, and
> contributed to the Environmental Trust newsletter as well as
> the
> Evening Star newspaper.
> In recent years, I have been part of the Guemes Ferry
> Trail
> committee; a group actively supporting the creation of a
> safe pathway
> along Guemes Island Road, from the ferry dock to School
> House Park.
> In our effort to make it possible for people to travel on
> foot or
> bicycle along this busy and narrow road, we have made
> presentations to
> all major island organizations and gained unanimous
> support. Skagit Co.
> Public Works has help move this project forward by surveying the road
> and
> allowing that there is enough county easement for a trail
> along
> the east side of the road.
> As a member of the GFT committee and long time advocate for
> Guemes
> Island's community health and safety I support the
> Comprehensive Plan
> Update for the consideration given to non motorized paths
> that promote
> safety, health and community connection.
> Thank you, Lorrie Steele
>

Lake Erie Trucking



Ravnik & Associates, Inc.
CIVIL ENGINEERING & LAND-USE PLANNING

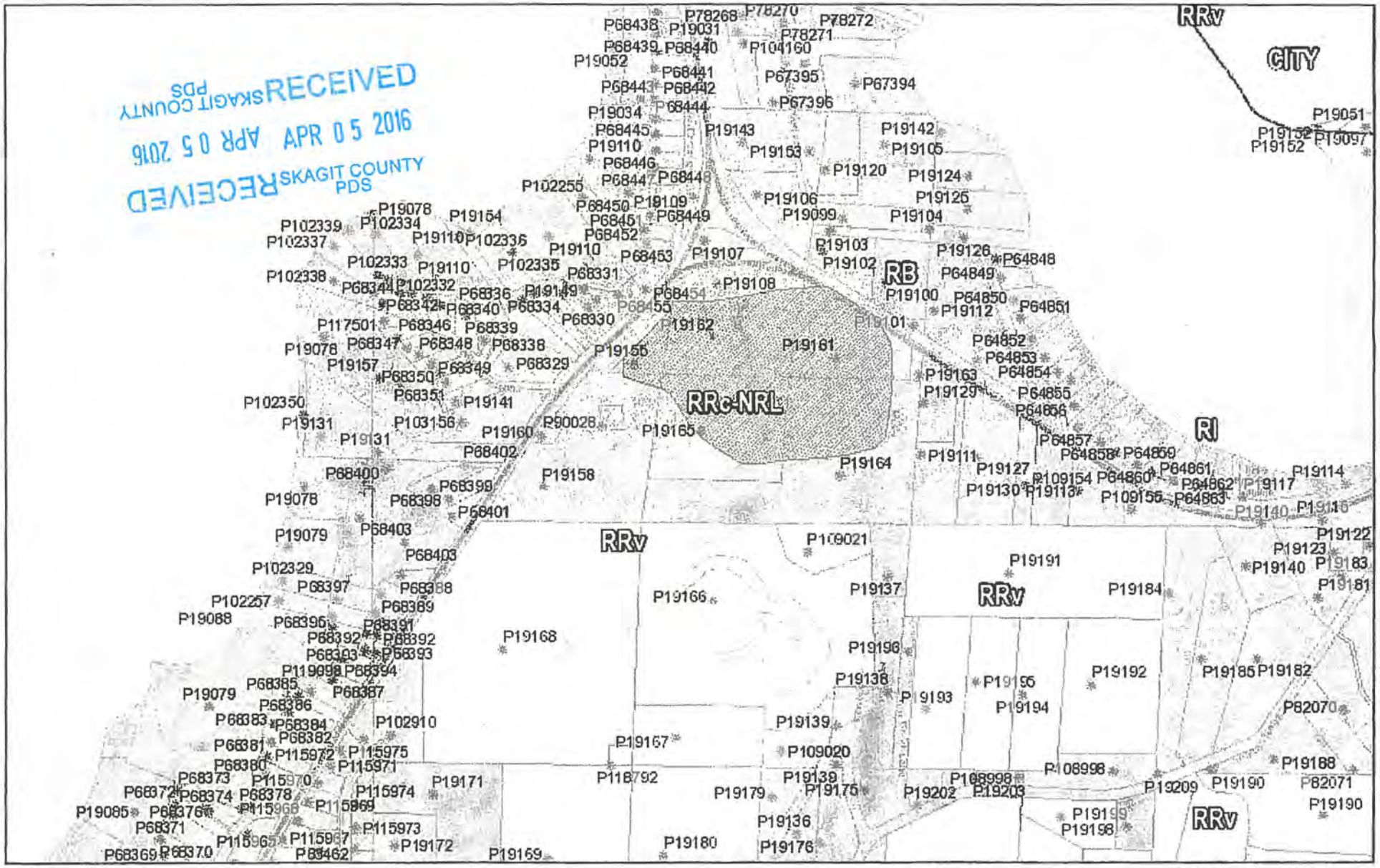
MINERAL RESOURCE OVERLAY (MRO)

SCALE: 1"=200'
DRAWN BY: HJH
CHECKED BY:
DATE: 11.03.03

SHEET TITLE
2006 AERIAL MAP

DRAWING NO. AERIAL.DWG
JOB NO. 03003
SHEET NO.

SHEET DESCRIPTION
GRAVEL PIT EXPANSION/ RECLAMATION
FOR
BILL WOODING/ LAKE ERIE TRUCKING
WEST 1/2 OF SECTION 11, T34N, R1E, WM



RECEIVED
SKAGIT COUNTY
PDS
APR 05 2016
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SKAGIT COUNTY
PDS

February 18, 2015

1:9,028

0 0.075 0.15 0.3 mi

0 0.1 0.2 0.4 km

Legend

- County Boundary
- Incorporated Areas
- Airport Environs Overlay [AEO]
- Water
- Dirt Accounts
- Senior Citizen Accounts
- Building Only Accounts
- Mineral Resource Overlay [MRO]
- Tax Parcels

Data Accuracy Warning: All GIS data was created from available public records and existing map sources. Map features have been adjusted to achieve a best-fit registration. While great care was taken in this process, maps from different sources rarely agree as to the precise location of geographic features. Map discrepancies can be as great as 300 feet.

From: Rawson/Thornburgh
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Tuesday, April 12, 2016 4:30:46 PM

I am submitting comments on the Transportation Element of Skagit County's Comprehensive Plan 2016 Update. I applaud the County for addressing the diverse needs of bicycle and pedestrian users of the transportation system. I agree that the County should encourage and promote public education for all uses on sharing the road. However, the plan needs to set actual benchmarks or implementation measures to be sure that these and other elements of the plan occur during the life of the plan.

The plan must include specific implementation measures for education for sharing the road, on appropriate routing and utilization of single-use and shared-use facilities, appropriate signage and road markings, coordination with cities and counties for connections in accessible routes, and use of advanced chip sealing.

Asphalt overlays should be designed to include bike lanes or signage for road sharing as they are implemented.

I encourage the County to form a task force to develop a master bicycle and pedestrian plan. The task force would develop and prioritize projects using expertise of residents who have experience using these facilities. I would be willing to serve on the task force and to support development of a non-motorized portion of the transportation plan.

Skagit County is a destination for recreation and offers many amenities for both residents and visitors. I have traveled by bicycle through Skagit County, Washington, many areas of the United States, and through many countries in Europe. I have observed that communities that provide services and infrastructure to visitors, including bicyclists, often appear more prosperous than neighboring communities without these amenities. The County has the opportunity to provide connections between cities on County roads that would make our area much more accessible and enjoyable for bicycle travel as well as for recreation of all types.

Kathy Thornburgh
3601 Carol Place
Mount Vernon, WA 98273

From:	Tim Trohimovich
To:	PDS comments
Subject:	Comments on proposed Comprehensive Plan 2016 Update
Date:	Thursday, April 14, 2016 3:06:52 PM
Attachments:	image001.png image003.png

Dear Sirs and Madams:

Enclosed please find Futurewise's comments on the proposed "Comprehensive Plan 2016 Update" and associated development regulations. The letter includes one of the referenced enclosures. The other referenced enclosures will follow in separate emails.

Thank you for considering our comments.

Tim Trohimovich, AICP
Director of Planning & Law

future wise
816 Second Avenue, Suite 200
Seattle, WA 98104-1530
206 343-0681 Ex 118
tim@futurewise.org
connect:
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816 Second Ave
Suite 200
Seattle, WA 98104

future wise

(206) 343-0681
fax (206) 709-8218
futurewise.org

April 14, 2016

Comments on proposed "Comprehensive Plan 2016 Update"
Skagit County Planning and Development Services
1800 Continental Place
Mount Vernon Washington 98273

Dear Sirs and Madams:

Subject: Comments on the Comprehensive Plan 2016 Update and associated development regulation updates.

Sent via email to: pdscomments@co.skagit.wa.us

Thank you for the opportunity to comment on the proposed Comprehensive Plan 2016 Update and associated development regulation updates. Futurewise is working throughout Washington State to create livable communities, protect our working farmlands, forests, and waterways, and ensure a better quality of life for present and future generations. We work with communities to implement effective land use planning and policies that prevent waste and stop sprawl, provide efficient transportation choices, create affordable housing and strong local businesses, and ensure healthy natural systems. We are creating a better quality of life in Washington State together. We have members across Washington State including Skagit County.

Futurewise strongly supports the Comprehensive Plan 2016 Update and associated development regulation updates. Overall, the comprehensive plan is well written and provides good guidance for future land use decisions. There are too many good features for us to mention them all, but we do want to call out several excellent features. They include:

- Incorporating the Envision Skagit 2060 findings and recommendations into the comprehensive plan.
- The excellent natural resource lands policies.
- Proposed policy 5A-5.1(m) which will protect people and property from damage from floods, higher tides, and storms.
- The substantial improvements to the housing element, Chapter 7.
- We strongly support proposed Skagit County Code (SCC) 14.24.380 and the proposed amendment to SCC 14.18.100(5)(i).

We do have suggestions to strengthen the update discussed below.

Comments on the Proposed amendments to Countywide Planning Policy 1 (March 4, 2016)

As will be documented in more detail below, "much of the water in" Skagit County "has already been spoken for."[1] There is very limited water available for new uses.[2] Large areas of the county are closed to the appropriation of surface and ground water.[3] There is the potential for wells near Puget Sound to pull sea water into the aquifers, polluting ground water.[4] Large areas of rural Skagit County are in the Wildland Urban Interface and have extreme, high, and moderate wildfire hazards.[5] While we recognize the 20 percent population allocation to the rural area is close the recent trends, we think that long-term that level of growth outside urban growth areas is unsustainable given these limitations. We recommend that the growth projection for areas outside the urban growth areas be reduced.

Comments on the Skagit County Comprehensive Plan 2016-2036 Public Comment Draft March 4, 2016

Comments on Chapter 2 Urban, Open Space and Land Use: Match planned growth to the available potable water supplies, see page 61

The Growth Management Act, in RCW 36.70A.070(1), provides in part that "[t]he land use element shall provide for protection of the quality and quantity of groundwater used for public water supplies." The Growth Management Act, in RCW 36.70A.070(5)(c), provides that "[t]he rural element shall include measures that apply to rural development and protect the rural character of the area, as established by the county, by: … (iv) [p]rotecting critical areas, as provided in RCW 36.70A.060, and surface water and groundwater resources …"

One of the key court decisions explaining Growth Management Act (GMA) requirements for surface and ground water protection since the last Skagit County Comprehensive Plan update is the

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[1] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 1 (Publication Number: 11-11-008, Revised May 2014) accessed on April 12, 2016 at: https://fortress.wa.gov/ecy/publications/SummaryPages/1111008.html and enclosed with this letter; State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Upper Skagit Watershed, WRIA 4* p. 1 (Publication Number: 11-11-009, Revised May 2014) accessed on April 12, 2016 at: https://fortress.wa.gov/ecy/publications/SummaryPages/1111009.html; State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Stillaguamish Watershed, WRIA 5* p. 1 (Publication Number: 11-11-010, Revised August 2012) accessed on April 12, 2016 at: https://fortress.wa.gov/ecy/publications/summarypages/1111010.html; State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Nooksack Watershed, WRIA 1* p. 1 (Publication Number: 11-11-006, Revised August 2012) accessed on April 12, 2016 at: https://fortress.wa.gov/ecy/publications/summarypages/1111006.html.

[2] *Id.*

[3] *Id.* at pp. 3 – 5.

[4] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* pp. 3 – 5 (Publication Number: 11-11-008, Revised May 2014).

[5] *Skagit County Community Wildfire Protection Plan* p. 24 (2012 version) accessed on April 14, 2016 at: http://www.skagitcounty.net/EmergencyManagement/Documents/wildfireprotectionplan2012.pdf

Washington State Supreme Court's *Kittitas County v. Eastern Washington Growth Management Hearings Board* decision, filed in 2011. Among several important holdings, the Washington State Supreme Court held that:

> ¶ 58 In fact, several relevant statutes indicate that the County must regulate to some extent to assure that land use is not inconsistent with available water resources. The GMA directs that the rural and land use elements of a county's plan include measures that protect groundwater resources. RCW 36.70A.070(1), (5)(c)(iv). Additional GMA provisions, codified at RCW 19.27.097 and 58.17.110, require counties to assure adequate potable water is available when issuing building permits and approving subdivision applications.[6]

These requirements are important in Skagit County because "much of the water in" Skagit County "has already been spoken for."[7] There is very limited water available for new uses.[8] Large areas of the county are closed to the appropriation of surface and ground water.[9] There is the potential for wells near Puget Sound to draw sea water into the aquifers, polluting ground water.[10] This adverse impact, sea water intrusion, has already occurred on Guemes Island with "significant seawater intrusion along its northern coast and in limited areas of its southern coast."[11] Sea water intrusion can worsen until wells "must be abandoned due to contaminated, unusable water."[12]

Because of these very limited water supplies, we have a series of recommendations, some of which are discussed under the rural element and the critical areas regulations update in addition to the land use element. We recommend that planned densities match the available water resources. Allowing the capacity for many more lots or homes than can be served with the available water sources will

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[6] *Kittitas Cnty. v. E. Washington Growth Mgmt. Hearings Bd.*, 172 Wn. 2d 144, 178 – 79, 256 P.3d 1193, 1209 (2011).
[7] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 1 (Publication Number: 11-11-008, Revised May 2014); State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Upper Skagit Watershed, WRIA 4* p. 1 (Publication Number: 11-11-009, Revised May 2014); State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Stillaguamish Watershed, WRIA 5* p. 1 (Publication Number: 11-11-010, Revised August 2012); State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Nooksack Watershed, WRIA 1* p. 1 (Publication Number: 11-11-006, Revised August 2012).
[8] *Id.*
[9] *Id.* at pp. 3 – 5.
[10] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* pp. 3 – 5 (Publication Number: 11-11-008, Revised May 2014).
[11] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 3 (Publication Number: 11-11-008, Revised May 2014).
[12] Emily B. Tibbott, *Seawater Intrusion Control in Coastal Washington: Department of Ecology Policy and Practice* p. 7 (United States Environmental Protection Agency Region 10, Office of Ground Water: Aug. 1992, EPA 910/9-92-023) accessed on April 12, 2016 at:
http://nepis.epa.gov/Exe/ZyNET.exe/200060G4.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1991+Thru+1994&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C91thru94%5CTxt%5C00000004%5C200060G4.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=p%7Cf&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL#.

allow those that subdivide first to create new lots and new houses, but condemn everyone else to existing lots that are unbuildable because all of the water is already used up under Washington's first in time, first in right water allocation system.[13] Or the county could attempt to equitably limit lots and development to those that can be served by the available water resources. The first approach will create some winners, but many, many losers. We recommend the second approach, one that seeks to attempt to match new development with available water resources. That is the fairer approach. This is important throughout the county including the islands, such as Guemes Island that both have limited water and water supplies that are subject sea water intrusion when the ground water is over pumped.[14]

So we recommend adopting the following new policy on page 61, or another appropriate location, to read as follows:

policy 2G-1.6 **Planned uses, densities, and planned growth throughout the county shall be consistent with available potable water supplies and protect surface and ground water resources.**

We recommend that the planned densities, especially those in rural areas, be reevaluated to make sure they are consistent with available water resources.

Comments on Chapter 3 Rural

Our recommendations related to the Wildland Urban Interface on page 8 also related to the rural area.

Reconsider the 80 percent growth allocation to urban growth areas, rural and resource lands may not have the resources to support 20 percent of the growth. See policy 3A-1.1 and policy 3A-2.2 on pages 79 to 80

As was documented above, rural and resource lands in Skagit County have very limited water. And we recommend that the priority for water be for agricultural and other uses. So we recommend reevaluating whether the rural and resource lands can accommodate 20 percent of the county's residential growth.

Amend policy 3A-2.1 on page 80 to protect water resources and comply with state law

Given the very limited water resources in in Skagit County,[15] ensuring that new subdivisions and new buildings have the legal right to use the potable water proposed to support them is just basic

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[13] *Postema v. Pollution Control Hearings Bd.*, 142 Wn.2d 68, 79 – 80, 11 P.3d 726, 734 (2000).
[14] Emily B. Tibbott, *Seawater Intrusion Control in Coastal Washington: Department of Ecology Policy and Practice* p. 7 (United States Environmental Protection Agency Region 10, Office of Ground Water: Aug. 1992, EPA 910/9-92-023).
[15] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 1 (Publication Number: 11-11-008, Revised May 2014); State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Upper Skagit Watershed, WRIA 4* p. 1 (Publication Number: 11-11-009, Revised May 2014); State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Stillaguamish Watershed, WRIA 5* p. 1 (Publication Number: 11-11-010, Revised August 2012); State of

consumer protection. When a family buys a lot or house, they should have clean and healthy water that is adequate for the proposed use and they should have the legal right to use the water so it not cutoff in the future.

This is also required by state law. RCW 19.27.097 requires applicants for building permits for buildings that need potable water to provide evidence of an adequate water supply. RCW 19.27.097(1) provides:

> (1) Each applicant for a building permit of a building necessitating potable water shall provide evidence of an adequate water supply for the intended use of the building. Evidence may be in the form of a water right permit from the department of ecology, a letter from an approved water purveyor stating the ability to provide water, or another form sufficient to verify the existence of an adequate water supply. In addition to other authorities, the county or city may impose conditions on building permits requiring connection to an existing public water system where the existing system is willing and able to provide safe and reliable potable water to the applicant with reasonable economy and efficiency. An application for a water right shall not be sufficient proof of an adequate water supply.

That RCW 19.27.097(1) requires as evidence a "water right permit." That a water right application is not sufficient proof of an adequate water supply shows that the legislature intended that building permit applicants must have the legal right to use the water. The Attorney General agreed with this reading writing that:

> In our opinion, an "adequate" water supply is one that is of sufficient quality and sufficient quantity to satisfy the demand created by the new building.
>
> ….
>
> The pertinent exception to the permitting requirements is found in RCW 90.44.050, which allows the withdrawal of up to 5,000 gallons a day of ground water for specified purposes without a permit. If ground water is regularly used beneficially as provided in that statute, then the appropriator will be entitled to a "right equal to that established by a permit issued under the provisions" of chapter 90.44 RCW. *Id.* Consequently, any applicant for a building permit who claims that the building's water will come from surface or ground waters of the state, other than from a public water system, must prove that he has a right to take such water.[16]

RCW 19.27.097 applies to all building permits for buildings necessitating potable water, not just residential building permits.

Washington Department of Ecology Water Resources Program, *Focus on Water Availability Nooksack Watershed, WRLA 1* p. 1 (Publication Number: 11-11-006, Revised August 2012).

[16] AGO 1992 No. 17 accessed on Jan. 6, 2016 at: http://www.atg.wa.gov/ago-opinions/requirement-adequate-water-supply-building-permit-issued

RCW 58.17.110 also requires Skagit County to assure adequate potable water supplies are available when approving subdivision applications. Further, the County must assure that development applications proposing to use exempt wells are within the withdrawal limits applicable to those wells. As the Washington State Supreme Court wrote:

> ¶ 61 Without a requirement that multiple subdivision applications of commonly owned property be considered together, the County cannot meet the statutory requirement that it assure appropriate provisions are made for potable water supplies. Instead, nondisclosure of common ownership information allows subdivision applicants to submit that appropriate provisions are made for potable water through exempt wells that are in fact inappropriate under *Campbell & Gwinn* when considered as part of a development, absent a permit. To interpret the County's role under RCW 58.17.110 to only require the County to assure water is physically underground effectively allows the County to condone the evasion of our state's water permitting laws. This could come at a great cost to the existing water rights of nearby property owners, even those in adjoining counties, if subdivisions and developments overuse the well permit exemption, contrary to the law.[17]

While we appreciate the proposed amendments to policy 3A-2.1, they fail to fully comply with these requirements. Further, policy 3A-2.1 calls for legislative action that does not address the basic problem which is a lack of available water. "Instream flows in the Skagit River are not met on average 100 days out of the year."[18] We suggest policy 3A-2.1 on page 80 be revised to read as follows with our additions double underlined and our deletions double struck through.

policy 3A-2.1 Manage development in rural areas through density requirements that protect and maintain existing rural character, natural resource lands, open space, critical areas, significant cultural resources, and water resources, and that manage traffic volumes.

(a) Consistent with RCW 19.27.097, Skagit County will not issue a ~~residential~~ building permit for a building requiring potable water unless the applicant can demonstrate they have a legal and adequate source of water, such as a water right from Washington State Department of Ecology, a letter from an approved public water purveyor like Skagit PUD, or an approved rainwater catchment system and the source meets drinking water standards.

(b) Consistent with RCW 58.17.110, Skagit County will approve a subdivision or division of land unless the applicant can demonstrate they have a legal and adequate source of water, such as a water right from Washington State Department of Ecology, a letter from an approved public water purveyor like Skagit PUD, or an approved rainwater catchment system and the source meets drinking water standards.

---

[17] *Kittitas County v. Eastern Washington Growth Management Hearings Bd.*, 172 Wn.2d 144, 178 – 81, 256, P.3d 1193, 1209 – 10 (2011) footnote omitted.

[18] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 2 (Publication Number: 11-11-008, Revised May 2014).

(c) Skagit County should work with the state legislature, state agencies, landowners, tribes, and other affected parties to resolve the uncertainty over rural water availability and achieve a long-term solution that meets the needs of all affected parties consistent with state law.

(d) All land currently or formerly in a common ownership is entitled to only one permit-exempt well system for each type of use authorized to use permit-exempt wells.

The county's development regulations should be updated consistent with revised policy 3A-2.1. We also support rain water catchment systems. They are a viable approach to providing water for low density development and are supported by the Washington State Department of Ecology (Ecology).[19]

Amend policy 3A-3.6 on page 83 to protect rural character and comply with state law

The Growth Management Act, in RCW 36.70A.110(4), provides that urban governmental services, defined in RCW 36.70A.030(18), are generally not appropriate to be extended or expanded into the rural area. They may be allowed if the following criteria are met:

(1) Cities are the most appropriate providers of urban governmental services;
(2) It is generally not appropriate to extend or expand urban governmental services into rural areas;
(3) Limited occasions to extend or expand are allowed that are:
(4) Shown to be necessary to protect:
  (a) basic public health and safety *and*
  (b) the environment, but;
(5) Only when the urban governmental services are financially supportable at rural densities; and
(6) Only when extension or expansion does not allow urban development.[20]

Policy 3A-3.6 includes many of these requirements, but omits requirements (5) and (6). So we recommend that policy 3A-3.6 be amended to include these requirements which protect taxpayers by ensuring that the facilities are affordable and protect rural character. Our recommended additions are double underlined and our recommended deletions are double struck through.

~~3.5~~policy 3A-3.6 Consistent with the Countywide Planning Policies, urban services shall not be extended into or expanded in rural areas except in those limited circumstances shown to be necessary to protect basic public health and safety and the environment, the services are financially supportable at rural densities, and the extension or expansion does not allow urban development.

[19] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 4 (Publication Number: 11-11-008, Revised May 2014).
[20] RCW 36.70A.110(4) & *Thurston County v. Cooper Point Association*, 108 Wn. App. 429, 434, 31 P.3d 28, 33 – 34 (2001). The Washington Supreme Court affirmed the Court of Appeals decision in *Thurston County v. Cooper Point Association*, 148 Wn. 2d 1, 57 P.3d 1156 (2002).

Designation of additional Rural Villages, policy 3C-1.7(a) on page 91.

Given that the county's nonconforming lot and other provisions allow development on existing small lots in the rural area and on agricultural lands of long-term commercial significance, designating additional rural villages only makes sense if they will see development beyond that allowed by the current zoning. We share the concerns of the Agricultural Advisory Board that this does not make sense at Blanchard. We also wonder if these areas have the water and other resources to support significant development beyond what is allowed by their current comprehensive plan designations and zoning. So we recommend against the adoption of proposed policy 3C-1.7(a).

Comments on Chapter 4 Natural Resource Lands

Maintain water needed by natural resource industries such as agriculture, please see page 138

Irrigation and other water is needed to support agriculture and other water is needed for forestry. In 2012, the most recent year for which data is available, Skagit County had 19,239 acres of irrigated farm land, up from 16,286 acres five years earlier.[21] Farms also need water for stock water, cleaning, and value added manufacturing. Transferring irrigation water to residential developments, as has already occurred in some counties, has adversely impacted the valuable agricultural industry.[22] So we recommend that the following new policy be added to page 138 of Chapter 4:

policy 4A-3.3 Irrigation water and water needed to support the agricultural, forest products, and mineral industries shall not be allow to be used as water sources for developments unless the water is available because the water is used more efficiently by the natural resource uses.

Incorporate the recommendations of the Skagit County Community Wildfire Protection Plan into the county's comprehensive plan and development regulations and direct growth away from the Wildland Urban Interface areas having extreme and high fire hazards and limit growth in areas of moderate fire hazards, please see page 146

The *Skagit County Community Wildfire Protection Plan* identifies large areas of the county as being in the Wildland Urban Interface and having extreme, high, and moderate wildfire hazards.[23] Many of these areas have experienced wildfires.[24] And many of these areas have seen rural development.[25] We

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[21] United States Department of Agriculture, National Agricultural Statistics Service, *2007 Census of Agriculture, Washington State and County Data Volume 1 Geographic Area Series • Part 47* Chapter 2: County Level Data, Table 10. Irrigation: 2012 and 2007 p. 289 (Feb. 2009) accessed on April 14, 2016 at: http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Washington/st53_2_010_010.pdf.

[22] See for example, Washington State Department of Agriculture, Washington Agriculture Strategic Plan 2020 and Beyond p. 56 (2009) accessed on April 12, 2016 at: http://agr.wa.gov/fof/

[23] *Skagit County Community Wildfire Protection Plan* p. 24 (2012 version) accessed on April 14, 2016 at: http://www.skagitcounty.net/EmergencyManagement/Documents/wildfireprotectionplan2012.pdf

[24] *Id.* at 23.

[25] *Id.* at p. 14.

recognize that many of the fire hazards are on rural land and these recommendations apply to the rural lands too, not just natural resource lands.

Within the Wildland Urban Interface, the *Skagit County Community Wildfire Protection Plan* recommendations include continued participation in the Firewise Communities program and to "[i]mplement, enforce, and maintain Codes, Covenants, Conditions, and Restrictions regarding building and defensible space within communities and at the county planning level: community boards/committees, Skagit County PDS."[26] We support these recommendations. Some of the Firewise principles, such as removing vegetation susceptible to burning near homes, must be implemented by the property owners.[27] Other Firewise principles, such as providing two ways out, are most effective if done by the county, especially for new development.[28] The Firewise Communities Program is a nationally recognized program to reduce the risk of damage from wildfires.[29]

Other steps, such as directing development away from the most hazardous parts of the Wildland Urban Interface need to be done by the county.[30] Directing growth away from these hazardous areas is important to protect people and property and to reduce wildfire fighting costs. "In general, the more houses and people, the more human caused fire ignitions occur (Blonski and others 2010, Hammer and others 2007). From 2001 through 2011, an average of 85 percent of wildfires in the United States as recorded by the National Interagency Fire Center (NIFC) were caused by people (121,849 lightning-caused and 717,527 human-caused[.]"[31] "Growing housing development in and near wildfire-prone forested areas is a primary factor in raising exposure to the risks and costs of wildfires, and forcing more resources to be spent on fire suppression to defend these areas in the event of a fire."[32] "Mandatory building codes and zoning laws at the state and local levels can help reduce future wildfire costs."[33] "Managing further development in high fire-risk areas is the single biggest opportunity we have right now to limit the threats and costs of wildfires."[34]

We support policy 4B-2.11 and the proposed amendments. We also recommend that policy 4B-2.11 be strengthened to better address these issues. Our recommended additions are double underlined and our deletions are double struck through.

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[26] *Id.* at p. 30.
[27] *Firewise Toolkit A Guide to Firewise Principles* p. *2 accessed on April 14, 2016 at: http://www.firewise.org/wildfire-preparedness/firewise-toolkit.aspx
[28] *Id.*
[29] About Firewise webpage accessed on April 14, 2016 at: http://www.firewise.org/about.aspx
[30] *Firewise Toolkit A Guide to Firewise Principles* p. *2.
[31] S.M. Stein, J. Menakis, J, M.S. Carr, S.J. Comas, S.I. Stewart, H. Cleveland, L. Bramwell, and V.C. Radeloff, *Wildfire, wildlands, and people: understanding and preparing for wildfire in the wildland-urban interface—a Forests on the Edge report* p. 15 (Gen. Tech. Rep. RMRS-GTR-299, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station Fort Collins, CO.: 2013) accessed on April 14, 2016 at: http://inciweb.nwcg.gov/photos/IDNCF/2015-09-28-1300-Clearwater-Post-Fire-Assessment/related_files/pict20151005-173454-0.pdf
[32] Rachel Cleetus and Kranti Mulik, *Playing with Fire How Climate Change and Development Patterns Are Contributing to the Soaring Costs of Western Wildfires* p. 11 (Union of Concerned Scientists: July 2014) accessed on April 14, 2016 at: http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/playing-with-fire-report.pdf.
[33] *Id.* at p. 13.
[34] *Id.* at pp. 37 – 38.

policy 4B-2.11 Wildfire Planning Program: ~~Consider adopting~~ Continue the Department of Natural Resources "Firewise Program~~.~~" consistent with the Natural Hazards Mitigation Plan and with agency partners such as the Skagit Conservation District, fire districts and state agencies. Skagit County supports further development of a county-wide wildfire planning program to increase public safety and awareness regarding forest fire dangers, and establish the means of managing, reducing and suppressing catastrophic wildfires. Adopt and implement codes for the portions of the Firewise Program that require county support, such as two ways out, for building construction and location standards to minimize fire hazards, and for defensible space around structures. Direct growth away from the Wildland Urban Interface with extreme and high fire hazards.

Comments on Chapter 5 Environment: Amend policy 5A-5.1(k) on page 202 to protect water resources and comply with state law

As was documented beginning on page 4 above, the requirements for legal and adequate water supplies applies to all building permits that require potable water and subdivisions of land.[35] So we recommend that policy 5A-5.1(k) on page 202 be amended to read as follows with our additions double underlined and our deletion double struck through.

(k) Consistent with State law (RCW 19.27.097 and RCW 58.17.110), Skagit County will not issue a ~~residential~~ building permit for a building requiring potable water or approve a subdivision unless the applicant can demonstrate they have a legal and adequate source of water, such as a water right from Washington State Department of Ecology, or a letter from an approved public water purveyor like Skagit PUD.

Comments on Chapter 8 Transportation: Address the Transportation Facility Plan deficit

The GMA, in RCW 36.70A.070(6)(a)(iv)(C), provides that if probable funding for transportation facilities "falls short of meeting identified needs, a discussion of how additional funding will be raised, or how land use assumptions will be reassessed to ensure that level of service standards will be met …." So RCW 36.70A.070(6)(a)(iv)(C) gives the county two choices: raise additional revenues, including grants, or change its land use projections.

We are concerned that the transportation element has an estimated $46,400,711 deficit.[36] We do appreciate that the county could close this deficit through state and federal grants and suggest that revenue should be added to revenue table if it really is feasible.[37]

We also appreciate that the element includes a 20 transportation facility plan with costs and revenues. That is a best practice that we strongly support.

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[35] RCW 19.27.097(1); RCW 58.17.110.
[36] Comprehensive Plan 2016-2036 Update Chapter 8: Transportation p. 298.
[37] *Id.* at 299.

Comments on Chapter 9 Utilities: Reconsider the amendments to policy 9A-8.8 on page 315

As was documented beginning on page 2 of this letter, it appears that the county comprehensive plan and development regulations allow more growth than can be supplied with available water resources in the county and in areas subject to sea water intrusion. As was also documented above, the Growth Management Act requires the land use and rural elements to protect surface and ground water. We are concerned that the amendments to policy 9A-8.8 indicating that these requirements are met and that there is a balance between allowed densities and available water resources is mistaken. Frankly, page 318 of the Utilities Profile confirms our concern stating:

> A large portion of rural Skagit County (an estimated 5,700 lots) is affected by the Skagit River Basin Instream Resources Protection Program Rule (WAC 173-503) adopted in 2001. Owners of these lots may not rely on permit exempt wells as an approved water source for new development unless the landowners can demonstrate a legal uninterruptable water source.

And the allowed plan and zoning, as we understand it, would allow still more development. So we recommend that policy 9A-8.8 be modified to call for an evaluation of whether planned growth does match available resources. Our additions are double underlined and our deletions are double struck through.

policy 9A-8.8 Evaluate whether water supplies are adequate to support the allowed ~~Limitations on~~ uses and densities. If there is a shortfall, adopt changes to the comprehensive plan and development regulations to balance planned growth and available water resources ~~should be considered maintained~~ within areas affected by the Skagit River Basin Instream Resources Protection Program Rule (WAC 173-503), ~~and any~~ other designated low flow stream corridors, and areas subject to sea water intrusion where necessary to limit individual wells, ~~and~~ protect base flows, and protect surface and ground water quality and quantity.

Comments on Chapter 10 Capital Facilities

Clarify policy 10A-1.4, Levels of Service, on page 333

The urban domestic water level of service seems to be listed under the rural column and the rural domestic water level of service seems to be listed under the urban column. We recommend they be reversed.

The fire suppression level of service standards also appear to be flipped. Again, we recommend they be reversed.

Include the required parts of the Capital Facility Plan Element

RCW 36.70A.070(3) requires the capital facilities plan element to include:

> (a) An inventory of existing capital facilities owned by public entities, showing the locations and capacities of the capital facilities; (b) a forecast of the future needs for such capital facilities; (c) the proposed locations and capacities of expanded or new capital facilities; (d) at least a six-year plan that will finance such capital facilities within projected funding capacities and clearly identifies sources of public money for such purposes; and (e) a requirement to reassess the land use element if probable funding falls short of meeting existing needs and to ensure that the land use element, capital facilities plan element, and financing plan within the capital facilities plan element are coordinated and consistent. Park and recreation facilities shall be included in the capital facilities plan element.

While we found the capital facility element well written and clear, we were unable to find the inventory, the forecast of future needs, the locations of needed facility expansions, the funding plan, or the provision calling for a reassessment of the land use if funding falls short. Perhaps this information will come later or be included in a technical report? Either way, it should be included with the capital facilities plan element before it is adopted.

Comments on Chapter 11 Economic Development

We found the Economic Development Element well written and the element supports high quality economic growth and family wage jobs. We do have a concern about one of the weaknesses identified in the Economic Development Profile. The Economic Development Profile, on page 383, identifies as an external threat "[l]imitations on rural of water rights." As was documented above, most water in Skagit County is already allocated. So allocating more water to rural residential development means that water must come from another source, such as instream flows, agriculture, industry, or one or more of the municipal water providers. While we agree there are opportunities for municipal providers to serve parts of the rural area at a rural level of service, transferring water from the other uses comes with an economic cost. Transfers from instream flows will reduce fisheries production, a historic and still valuable part of the economy. Transfers from agriculture would reduce agricultural production. We are concerned that unconstrained rural development requiring transfers from other economic sectors is a greater economic threat than requiring rural residential development to comply with the state water codes.

Comments on Chapter 12 Plan Implementation and Monitoring

We strongly support including a chapter on comprehensive plan implementation. A comprehensive plan is only as good as its implementation. We think the plan implementation chapter will help carry out a very good comprehensive plan.

Comments on the Proposed Development Regulation Amendments

Adopt better protections for people and property from landslides. See Skagit County Code (SCC) 14.24.400, SCC 14.24.420, and SCC 14.24.430 on page 7

The *Skagit County Natural Hazards Mitigation Plan* documents that landslides are a significant hazard in Skagit County.

> Skagit County's somewhat steep terrain, high precipitation, and its abundance of unconsolidated glacial sediments, and the possibility of earthquakes all combine to make the county susceptible to land movement. While small slides and debris flows occur on a somewhat regular basis, there have been several slides and/or debris flows that have resulted in loss of life and/or property damage.[38]

The *Skagit County Natural Hazards Mitigation Plan,* citing the United States Geological Survey, recommends "[a]void building near steep slopes, close to mountain edges, near drainage ways, or natural erosion valleys."[39] This is consistent with landslide science which shows that on a practical level most landslides cannot be mitigated except through avoidance.[40]

Since the adoption of the last comprehensive plan update we have experienced the Oso tragedy. That tragedy, unfortunately, reminded us that landslide hazards can be deadly.[41] Recent research shows that long runout landslides are more common in Cascade foothills than had been realized.[42] This research documents that over the past 2000 years, the average landslide frequency of long runout landsides in the area near the Oso landslide is one landslide every 140 years.[43]

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[38] Skagit County Department of Emergency Management, *Skagit County Natural Hazards Mitigation Plan* p. 104 (2014) accessed on April 13, 2016 at: ftp://ftp.skagitcounty.net/DEM/NatHazMitPlan2014.pdf
[39] Id. at p. 110.
[40] Lynn M. Highland and Peter Bobrowsky, *The Landslide Handbook—A Guide to Understanding Landslides* pp. 14 – 24 (U.S. Geological Survey Circular 1325, Reston, Virginia: 2008) accessed on April 13, 2016 at: http://pubs.usgs.gov/circ/1325/.
[41] Jeffrey R. Keaton, Joseph Wartman, Scott Anderson, Jean Benoît, John deLaChapelle, Robert Gilbert, David R. Montgomery, *The 22 March 2014 Oso Landslide, Snohomish County, Washington* p. 1 (Geotechnical Extreme Events Reconnaissance (GEER): July 22, 2014) accessed on April 13, 2016 at: http://www.geerassociation.org/index.php/component/geer_reports/?view=geerreports&id=30
[42] Sean R. LaHusen, Alison R. Duvall, Adam M. Booth, and David R. Montgomery, *Surface roughness dating of long-runout landslides near Oso, Washington (USA), reveals persistent postglacial hillslope instability* GEOLOGY pp. *2 – 3, published online on 22 December 2015 as doi:10.1130/G37267.1; Geological Society of America (GSA) Data Repository 2016029, *Data repository for: Surface roughness dating of long-runout landslides near Oso, WA reveals persistent postglacial hillslope instability* p. 4 both included in a separate email.
[43] Sean R. LaHusen, Alison R. Duvall, Adam M. Booth, and David R. Montgomery, *Surface roughness dating of long-runout landslides near Oso, Washington (USA), reveals persistent postglacial hillslope instability* GEOLOGY p. *2, published online on 22 December 2015 as doi:10.1130/G37267.1.

It is important to understand that homeowners insurance does not cover the damage from many natural hazards such as landslides. "Insurance coverage for landslides is uncommon. It is almost never a standard coverage, and is difficult to purchase inexpensively as a policy endorsement."[44]

None of the Oso victims' homes were covered by insurance for landslide hazards.[45] And that is common when homes are damaged by landslides.[46] For example, on March 14, 2011, a landslide damaged the home of Rich and Pat Lord.[47] This damage required the homeowners to abandon their home on Norma Beach Road near Edmonds, Washington. Because their homeowners insurance did not cover landslides, they lost their home.[48] This loss of what may be a family's largest financial asset is common when homes are damaged or destroyed by landslides or other geological hazards.

Landslide buyouts are rare and when they occur the property owner often only recovers pennies on the dollar. The property owners bought out after the Aldercrest-Banyon landslide in Kelso, Washington destroyed their homes received 30 cents on the dollar.[49] This is underlines why preventing development in landslide hazards is just plain, ordinary consumer protection. To address these hazards we recommend that SCC 14.24.400, SCC 14.24.420, and SCC 14.24.430 be updated to recognize the new science resulting from the Oso landslide.

First, we recommend that SCC 14.24.420(1) require review of any landslide capable of damaging the proposed development. Currently, SCC 14.24.420(1) only requires review of landslide hazards within 200 feet or "a distance from the base of a landslide hazard area equal to the vertical relief, and that the geologic condition may pose a risk to life and property …" Landslide hazards are capable of damaging property much farther away than these distances. The 2014 Oso slide ran out for over a mile (6,562 feet), this was 10 times the vertical relief of the slope.[50] All 25 of the North Fork of the Stillaguamish River valley landslides analyzed in the LaHusen article (which includes the 2014 Oso slide), enclosed in a separate email, ran out farther than the vertical relief of the slope or 200 feet.[51] They ranged from 1.45 times the vertical relief to ten times the vertical relief.[52] In a study of 38 large, catastrophic landslides that occurred in northern British Columbia in the last three decades, researchers were able to calculate height to length ratios for 17 of the landslides. Based on these

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[44] Robert L. Schuster & Lynn M. Highland, *The Third Hans Cloos Lecture: Urban landslides: socioeconomic impacts and overview of mitigative strategies* 66 BULLETIN OF ENGINEERING GEOLOGY AND THE ENVIRONMENT 1, p. 22 (2007) accessed on April 13, 2016 at: ftp://193.134.202.10/pub/TRAMM/Workshop_EWS/Literature/Schuster_and_Highland_2007_Bulletin_of_Engineering_Geology_and_the_Environment.pdf

[45] Sanjay Bhatt, *Slide erased their homes, but maybe not their loans* The Seattle Times (April 2, 2014) accessed on April 13, 2016 at: http://old.seattletimes.com/html/latestnews/2023278858_mudslidefinancialxml.html

[46] *Id.*

[47] Ian Terry, *Abandoned and trashed after mudslide, Edmonds house now for sale* The Herald (Feb. 11, 2015). The house is for sale after the bank who held the Lord's mortgage took ownership of the home. *Id.* accessed on April 13, 2016 at: http://www.heraldnet.com/article/20150211/NEWS01/150219829

[48] *Id.* at p. *6.

[49] Isabelle Sarikhan, *Sliding Thought Blog, Washington's Landslide Blog* Landslide of the Week – Aldercrest Banyon Landslide July 29, 2009 accessed on April 13, 2016 at: https://slidingthought.wordpress.com/2009/07/29/landslide-of-the-week-aldercrest-banyon-landslide/

[50] Geological Society of America (GSA) Data Repository 2016029, *Data repository for: Surface roughness dating of long-runout landslides near Oso, WA reveals persistent postglacial hillslope instability* p. 4.

[51] *Id.*

[52] *Id.*

height to length ratios, all of the landslides had runout distances longer than the height of the slope, many cases the runout was much longer than the height of the slope.[53] Skagit County is vulnerable to similar landsides.

In fact, after analyzing many landslides and the scientific literature, Legros concluded in another peer-reviewed study that "[t]he ratio [height to length] H/L may therefore be physically meaningless. The good correlations between runout distance and volume, and area and volume, suggest that landslide spreading is essentially controlled by their own volume, and not by H."[54] He also wrote that "hazard zonation for landslide events should rely on their area– volume relationship ...."[55] But the CAO update proposes to continue to use the unsubstantiated height of the slope to predict the extent of landslide hazards. This failure to base the critical areas regulations on current science violates the Growth Management Act.[56]

Second, we recommend that that the regulations explicitly require the site specific identification of the top of landslide slope and slope faces subject to failure and sliding, toe of slope areas subject to impact from down slope run-out, and buffers for areas subject to landslide hazards. The Joint SR 530 Landslide Commission recommends identifying "[c]ritical area buffer widths based on site specific geotechnical studies" as an "innovative development regulation[]" that counties and cities should adopt.[57]

Third, we recommend that construction not be allowed on landslides, landslide run-out areas, and their buffers even if that means that a lot is unbuildable. As the over $100 million spent in the Oso landslide remediation shows, allowing construction in these areas results in the creation of nuisances and so Snohomish County is not legally obligated to allow construction on these areas.[58] In the *Bayfield Resources Co. v. Western Washington Growth Management Hearings Board* decision, the State of Washington Court of Appeals upheld against a substantive due process challenge and other challenges a rural zoning district that required the deduction of landslide hazard areas and certain other critical areas from the land used to calculate the allowed number of housing units.[59] The Court of Appeals agreed that landslide hazard areas are not to be built on.

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[53] Marten Geertsema, John J. Clague, James W. Schwab, Stephen G. Evans, *An overview of recent large catastrophic landslides in northern British Columbia, Canada* 83 ENGINEERING GEOLOGY 120, p. 120 & pp. 124 – 25 (2006) accessed on April 13, 2016 at: https://chip.northernhealth.ca/Portals/2/Document%20Repository/2014%20Updates/Recent%20Catastrophic%20Slides%20in%20Northern%20BC.pdf and enclosed in a separate email. Engineering Geology is a peer-reviewed scientific journal. *Engineering Geology Author Information Pack* pp. 5 – 7 accessed on April 13, 2016 at: https://www.elsevier.com/journals/engineering-geology/0013-7952?generatepdf=true and enclosed in a separate email.
[54] Francois Legros, *The mobility of long-runout landslides* 63 ENGINEERING GEOLOGY 301 p. 328 (2002) accessed on April 13, 2016 at: https://www.researchgate.net/publication/222894450_The_mobility_of_long-runout_landslides_Eng_Geol and enclosed in a separate email.
[55] *Id.* at pp. 328 – 29.
[56] *Honesty in Environmental Analysis and Legislation (HEAL) v. Central Puget Sound Growth Management Hearings Bd.*, 96 Wn. App. 522, 533, 979 P.2d 864, 870 – 71 (1999).
[57] The SR 530 Landslide Commission, *Final Report* p. 31 (Dec. 15, 2014) accessed on April 13, 2016 at: http://www.governor.wa.gov/sites/default/files/documents/SR530LC_Final_Report.pdf
[58] *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1029 (1992) accessed on April 13, 2016 at: http://www.supremecourt.gov/opinions/boundvolumes/505bv.pdf
[59] *Bayfield Resources Co. v. Western Washington Growth Management Hearings Bd.*, 158 Wn. App. 866, 883, 244 P.3d 412, 420 (2010).

Fourth, we recommend that Skagit County require adequate public notice of landslide hazards. The can include mailings to property owners in tax statements, notices on plats, and signing landslide hazards on the ground. The SR 530 Landslide Commission also recommended similar actions.[60]

We support that SCC 14.24.400 is being amended to regulate all of the landslide hazards identified in WAC 365-190-120(6) that occur within the community. This will better protect people and property.

We strongly support the amendments to SCC 14.02.050 Vesting of applications, C-1, on page 10

Washington State's vesting rules provide developers more protection than the rules generally applied in other states.[61] However, this protection for developers can come at a cost to the community and the people who buy lots or homes that do not comply with the county's current regulations to protect property and human life. As the Washington State Supreme Court wrote:

> Development interests can often come at a cost to public interest. The practical effect of recognizing a vested right is to potentially sanction a new nonconforming use. "A proposed development which does not conform to newly adopted laws is, by definition, inimical to the public interest embodied in those laws." *Erickson*, 123 Wn.2d at 873–74, 872 P.2d 1090. If a vested right is too easily granted, the public interest could be subverted. *Erickson*, 123 Wn.2d at 874, 872 P.2d 1090.[62]

The proposed amendments to SCC 14.02.050, vesting of applications, are consistent with state law[63] and so provide protections for developers but do not provide so much protection as to subvert the public interest. We strongly support these amendments.

The approval criteria for SCC 14.16.600, Essential Public Facilities, should require an adequate and legal supply of water. See pages 25 – 26

We support the amendments to SCC 14.16.600 as they more finely define the uses allowed as essential public facilities, appropriate locations for essential public facilities, and potential mitigation. As was documented above, there is little available, unallocated water in Skagit County.[64] SCC

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[60] SR 530 Landslide Commission, *Final Report* p. 33 (Dec. 15, 2014).
[61] *Abbey Rd. Grp., LLC v. City of Bonney Lake*, 167 Wn.2d 242, 250, 218 P.3d 180, 183 (2009).
[62] *Id.* at 167 Wn. 2d at 251, 218 P.3d at 183.
[63] *Potala Vill. Kirkland, LLC v. City of Kirkland*, 183 Wn. App. 191, 197 – 202, 334 P.3d 1143, 1145 – 48 (2014) *review denied*, 182 Wn. 2d 1004, 342 P.3d 326 (2015) "**the vested rights doctrine is now statutory**" and complete building permit and subdivision applications vest developments to the development regulations in effect at the time a complete application is submitted. Emphasis in the original.
[64] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 1 (Publication Number: 11-11-008, Revised May 2014); State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Upper Skagit Watershed, WRIA 4* p. 1 (Publication Number: 11-11-009, Revised May 2014); State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Stillaguamish Watershed, WRIA 5* p. 1 (Publication Number: 11-11-010, Revised August 2012); State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Nooksack Watershed, WRIA 1* p. 1 (Publication Number: 11-11-006, Revised August 2012).

14.16.600 would allow some of these uses outside urban growth areas where a water utility may not be available. So the decision maker for an essential public facility should consider whether the facility has an adequate and legal supply of water that meets drinking water standards. That should be one of the approval criteria for an essential public facility and should be added to SCC 14.16.600(5).

Please clarify 14.06.110(13) on page 36

We recommend that SCC 14.06.110(13), level I review procedures, be clarified to correct the citation to the county's SEPA appeal procedures and clarify that the Hearings Examiner's decision on the SEPA threshold decision is the final county decision. Our recommended changes are double underline and double struck through.

> (13) The decision of the Hearing Examiner on the open record appeal may be appealed to the Board by filing a written Notice of Appeal with the clerk of the Board that meets the requirements of Subsections (8) and (9) of this Section within 14 days after the date of the Hearing Examiner decision, or decision on reconsideration, if applicable. Consistent with SCC 14~~6~~.12.210, Appeals, the decision of the Hearing Examiner on a SEPA threshold determination is the final county determination and no appeal to the Board is allowed. This appeal shall be processed as a closed record appeal, pursuant to the provisions of SCC 14.06.170. The appellant shall bear the burden of proving the decision of the Hearing Examiner was clearly erroneous. The Board shall not overturn or modify the decision of the Hearing Examiner unless it finds it is clearly erroneous. The closed record appeal shall be conducted and a decision rendered within 60 days of the receipt of the Notice of Appeal.

We recommend that the county retain the requirement that for a buffer reduction through a waiver, the neighboring resource land owner's approval is required with the option that the county can override the buffer requirement without the neighboring property owner's approval. See SCC 14.16.810(7) on pages 40 – 41

We appreciate and support the buffer requirements of SCC 14.16.810(7). We recommend that the county retain the requirement that for a buffer reduction through a waiver, that the approval of the neighboring resource land owner be required with the option that the county can override the buffer requirement without the neighboring property owner's approval. Some buffers, such as buffers for the application of fumigants, are required by federal regulation and a neighbor's release will not reduce the width of the federally required buffer.[65] And a 100 or 150 foot wide buffer will not

[65] See for example U.S. Environmental Protection Agency webpage "Buffer Zone Requirements for Soil Fumigant Applications" accessed on April 13, 2016 at: https://www.epa.gov/soil-fumigants/buffer-zone-requirements-soil-fumigant-applications

protect residential uses from being impacted by agricultural uses, leading to complaints that can drive farmers out of business.[66] So we recommend these provisions be retained.

We support incorporating the Guemes Island Subarea Plan into the comprehensive plan and development regulations.

We support incorporating the Guemes Island Subarea Plan into the comprehensive plan and development regulations. We believe this subarea plan has important guidance for the future development of Guemes Island.

We strongly support proposed SCC 14.24.380, the proposed amendment to SCC 14.18.100(5)(i) and a study and comprehensive plan and zoning amendments to match allowed growth with safe and sustainable withdrawals in areas susceptible to sea water intrusion. See pages 59 – 62

The Washington State Department of Ecology (Ecology) documents that parts of Skagit County along Puget Sound are susceptible to sea water intrusion, which can be caused by over pumping ground water, which then causes sea water to move into fresh water aquifers making them unsuitable to use as a potable water supply.[67] "Guemes Island has experienced significant seawater intrusion along its northern coast and in limited areas of its southern coast."[68] All of Guemes, Sinclair, Cypress, and Vendovi islands are susceptible to sea water intrusion.[69] Sea water intrusion can worsen until wells "must be abandoned due to contaminated, unusable water."[70] This can include existing wells. Of course, if no economical substitute water supply is available for existing well owners, this creates significant problems.

Ecology calls for evaluating proposed wells along Puget Sound to determine if they may contribute to sea water intrusion into aquifers used as drinking water sources.[71] If the evaluation shows the proposed well may increase the risk of sea water intrusion, the proposed withdrawal must mitigate

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[66] Prepared by the Resource Lands Review Committee of the Rogue Valley Regional Problem Solving process, *Guidelines for Establishing Effective Buffers Between Rural Agricultural and Urban Uses* pp. 21 – 23 (June 6, 2006) accessed on April 13, 2016 at: http://rvcog.org/rps_pdf/Ag_buffering_guidelines.pdf; Department of Natural Resources, Queensland & Department of Local Government and Planning, *Queensland Planning Guidelines: Separating Agricultural and Residential Land Uses* p. 19 (DNRQ 97088: Aug. 1997) accessed on April 13, 2016 at: http://www.dilgp.qld.gov.au/resources/policy/plng-guide-sep-ag.pdf; and Arthur C. Nelson, *Preserving Prime Farmland in the Face of Urbanization: Lessons from Oregon* 58 JOURNAL of the AMERICAN PLANNING ASSOCIATION 467, p. 468 (1992).
[67] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 1 (Publication Number: 11-11-008, Revised May 2014); Emily B. Tibbott, *Seawater Intrusion Control in Coastal Washington: Department of Ecology Policy and Practice* pp. 5 – 7 (United States Environmental Protection Agency Region 10, Office of Ground Water: Aug. 1992, EPA 910/9-92-023).
[68] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 3 (Publication Number: 11-11-008, Revised May 2014).
[69] *Id.* at p. 5.
[70] Emily B. Tibbott, *Seawater Intrusion Control in Coastal Washington: Department of Ecology Policy and Practice* p. 7 (United States Environmental Protection Agency Region 10, Office of Ground Water: Aug. 1992, EPA 910/9-92-023).
[71] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 3 (Publication Number: 11-11-008, Revised May 2014).

that impact.[72] There are maximum withdrawal levels above which the aquifer will become contaminated along with existing wells.[73] Water withdrawals should be maintained below these levels.

We strongly support proposed SCC 14.24.380, Seawater Intrusion Areas. We believe it will help protect coastal areas and their wells from sea water intrusion. We recommend two changes to SCC 14.24.380. First, we recommend that wells where the samples exceed the U.S. Environmental Protection Agency's drinking water standard for chloride of 250 mg/l (milligrams per liter) for public water systems[74] not be used for any purpose, including individual homes. The water is not healthy and the potential to contaminate other wells is too great. Second, we recommend that rain water catchment systems be allowed. This is a viable option approved by Ecology.[75]

We also strongly support proposed amendment to SCC 14.18.100(5)(i). However, as we documented above, all of Guemes, Sinclair, Cypress, and Vendovi islands are susceptible to sea water intrusion.[76] Therefore, the requirement should apply to all of these islands. So we recommend that the proposed amendment to SCC 14.18.100(5)(i) be revised to read as follows with our additions double underlined and our deletions double stuck through.

> (i) Evidence must be supplied from the applicable purveyor of the availability of water to serve the projects and adequate provision for sewage disposal. The method of sewage disposal shall also be provided, including soil data, if individual sewage disposal is to be used, or if public sewer or community septic disposal is used, the name of the system. If individual wells are to be utilized, documentation approving the well sites must be provided, pursuant to Chapter 12.48 SCC. A land division within the areas identified in SCC 14.24.380(1), Applicability, ~~1/2 mile of a marine shoreline~~ may not propose to use a well where chloride levels are 200 ppm or greater.

Finally as we recommended in our comments on the comprehensive plan, Skagit County should review the densities allowed in the areas that rely on wells in areas susceptible to sea water intrusion to make sure that the allowed development does not exceed the available ground water resources based on an aquifer recharge study. Growth should not be allowed to use ground water where their withdrawals would exceed safe and sustainable withdrawal rates. While some argue that water can be provided through reverse osmosis systems sea water treatment systems, these systems are costly to build and operate. Existing well users should not have undergo the expense of these systems to allow the over development of our shorelines.

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[72] *Id.*
[73] Emily B. Tibbott, *Seawater Intrusion Control in Coastal Washington: Department of Ecology Policy and Practice* pp. 7 – 8 (United States Environmental Protection Agency Region 10, Office of Ground Water: Aug. 1992, EPA 910/9-92-023).
[74] *Id.* at p. 7.
[75] State of Washington Department of Ecology Water Resources Program, *Focus on Water Availability Lower Skagit Watershed, WRIA 3* p. 4 (Publication Number: 11-11-008, Revised May 2014).
[76] *Id.* at p. 5.

We support the Maximum Lot Coverage amendments for the Rural Reserve (RRv) in SCC 14.16.320. See page 68

The scientific literature documents that impervious surface and clearing regulations are needed to protect water quality.[77] The sliding scale imperious surface limits proposed for SCC 14.16.320 will help protect water quality. We support them.

Thank you for considering our comments. If you require additional information please contact me at telephone (206) 343-0681 Ext. 118 or email tim@futurewise.org

Very Truly Yours,

Tim Trohimovich, AICP
Director of Planning & Law

Enclosures

[77] Derek B. Booth, David Hartley, and Rhett Jackson, *Forest Cover, Impervious-Surface Area, and the Mitigation of Stormwater Impacts* 38 JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION 835, 844 (2002). The Journal of the American Water Resources Association is a peer-reviewed scientific journal. Journal of the American Water Resources Association Instructions for Authors p. *7 (March 2015) accessed on April 13, 2016 at: http://www.awra.org/jawra/JAWRA%20Instructions%20for%20Authors.pdf

Lower Skagit Watershed, WRIA 3

This focus sheet provides information on the availability of water for new uses in the Lower Skagit Watershed. This information provides a starting point for potential water users in determining the best strategies for securing water for a future project or proposal in this area.

The Lower Skagit Watershed, also known as Water Resource Inventory Area 3 (WRIA 3), is situated in the northern part of Puget Sound east of the San Juan Islands. It comprises the western part of Skagit County and small portions of Snohomish and Whatcom Counties. Fidalgo, Guemes, Cypress and other smaller offshore islands are also included in the WRIA 3 watershed.

In addition to the Skagit River and its delta, the watershed includes Lake Samish and the Samish River watersheds. These watersheds are not subject to the instream flows set for the Skagit River and its various smaller tributary streams, such as Fisher, Carpenter, Jones and Day Creeks.

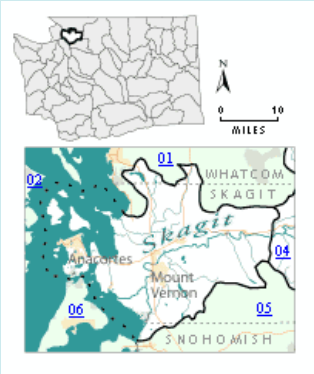
Water from the Skagit River basin supports a robust agricultural economy, hydroelectric generation and growing cities and towns. The Skagit River is the only large river system in Washington that contains healthy populations of all five native salmon species. To preserve these fish runs, the state has set instream flows to protect and preserve water flow in the river and its tributaries.

Yearly precipitation ranges from as little as 15-20 inches in the coastal area to over 70 inches in the Cultus Mountains. Most of this precipitation arrives during the winter months when water demand is low. Demand for water is high during the summer months when stream flows are naturally low due to little precipitation. Stream flows, especially in tributary creeks, are dependent on groundwater. This means that groundwater and surface water are least available when water demands are the highest.

Factors affecting water availability

Instream Resources Protection Program rule

Much of the water in the Lower Skagit Watershed is already legally spoken for. Increasing demands for water from population growth,



Definitions

Consumptive use: A use of water that diminishes the quantity or quality of water in the water source.

Instream flow rule: Establishes a water right for streams in a particular watershed. The rule specifies the amount of water needed in a particular place for a defined time for each stream. Typical instream flow rules now include broader water management strategies.

Mitigation plan: A scientifically-sound plan intended to avoid impairment to existing water rights or capturing water from a closed source.

Non-consumptive use: A use of water that does not diminish the quantity of water in the water source, such as power generation.

Permit-exempt well: The state Ground Water Code allows for certain uses of small quantities of groundwater without obtaining a permit from Ecology. (RCW 90.44.050)

Reservation: A reservation of water is a one-time finite amount of water set aside for specific future uses. Reservations typically provide year-round water and have conditions of use required to access them.

declining groundwater levels in some areas, and the impacts of climate change have added to the challenge of finding water for new uses in WRIA 3. The Lower Skagit Watershed lacks water when and where it is needed, particularly during the summer months.

WRIA 3 has an Instream Resources Protection Program rule (WAC 173-503), often referred to as the Skagit instream flow rule. It was effective on April 14, 2001, to protect senior water rights and maintain a healthy ecosystem. Such rules are required by state law (RCW 90.54). This rule applies only to the Skagit River and its tributaries. It does not apply to the Samish River basin or Fidalgo, Cypress, Guemes, Hope and Goat Islands.

An instream flow rule is essentially a water right for the river. Once the rule is established, all water uses established after the rule are interruptible. Instream flows in the Skagit River are not met on average 100 days out of the year. Stream flows fall below the instream flow levels during some days of almost every month of the year, but the low-flow periods are most concentrated during the end of the dry season in late summer and early fall.

Interruptible water right: A water right that is junior in priority to other water rights, including instream flow levels. The water use can be forced to shut off until senior water rights are fulfilled. An interruptible water right generally cannot be used for uses requiring a continuous water supply, such as domestic water use.

Reservations created in 2006 amendment; Supreme Court overturns in 2013

Ecology revised the Skagit River Instream Flow Rule in 2006 to establish finite "reservations" of surface and groundwater for future out-of-stream uses. The reservations provided uninterruptible water supplies for future water users that could be legally used even if flows in the Skagit River fell below the regulatory flow levels. The water reserves were divided among 25 different tributaries and stretches of the Skagit River.

On Oct. 3, 2013, the Washington State Supreme Court ruled that Ecology exceeded its authority to create reservations through rulemaking where water was set aside to support stream flows for fish. As a result of the Court's decision, all water uses established after April 14, 2001 in the Skagit River basin and its tributaries are junior to the instream flows and are subject to curtailment when instream flow levels are not met. All new water uses requiring a continuous and reliable source of water, including permit-exempt wells, must be mitigated to prevent impairment of the instream flows.

For more information, see Ecology publication #13-11-006: "Frequently Asked Questions: Water Availability for Skagit basin landowners"; online at:
https://fortress.wa.gov/ecy/publications/publications/1311006.pdf

Indian Tribe Reservations

The Swinomish Indian Reservation and Upper Skagit Reservation lands are located within WRIA 3. Federally- reserved rights are not quantified at this time and therefore the legal availability of water in these areas is undetermined.

Wild and Scenic Rivers

The Skagit River and the Cascade, Sauk, and Suiattle tributaries are designated as Wild and Scenic Rivers

by the U.S. Wild and Scenic Rivers Act (16 USC 1271-1287). Any water withdrawals that would interrupt the free flowing condition of these rivers, such as run-of-the-river hydropower projects, would not be approved.

Coastal areas of Puget Sound

Any proposed water withdrawals in the coastal areas of Puget Sound are evaluated for the risk of seawater intrusion into fresh groundwater supplies. Coastal applicants may need to develop an adequate mitigation plan to address the risk of seawater intrusion. Guemes Island has experienced significant seawater intrusion along its northern coast and in limited areas of its southern coast.

Samish River basin

As stated earlier, WAC 173-503 does not include the Samish River basin. At this time it is not known whether water is available for future uses in this area. The Department of Fish and Wildlife has recommended closing much of the basin to new consumptive water uses.

Water currently available for new uses

Water for non-consumptive uses (such as power generation) and **water uses that can be interruptible** may be approved, subject to interruption during low flows of the Skagit River and designated tributaries.

Working towards water solutions in the Skagit Watershed

Ecology and the state legislature recognize that water is needed to support homes, farms and businesses in the Skagit River Watershed. In April 2012, the Washington state Legislature provided funding to Ecology to develop mitigation programs that balance instream and out-of-stream benefits in the Skagit. This is much like the agency has been doing with the successful Office of Columbia River Program in eastern Washington.

Ecology is working on mitigation projects and programs that will provide legally-secure water supplies for existing and future water uses in the Skagit River basin while protecting instream flows. Projects in development include purchase of senior water rights that can be reallocated to out-of-stream and instream uses, and stream flow enhancement through timed releases of water. Ecology is working with local government and tribal leaders, landowners and other stakeholders to determine the best and most cost-effective package of actions to address both instream and out-of-stream needs.

For more information see the Skagit Water Solutions web page:
http://www.ecy.wa.gov/programs/wr/nwro/skagit-wtrsolut.html

Additional options for obtaining water

Skagit basin landowners who wish to use a well -- but did not establish use of a well before the April 14, 2001 effective date of the Skagit Instream Flow Rule -- have several options they can pursue. The availability of the following options will vary based on location and other factors:

- Hook up to the Skagit PUD or another local public water system.
- Acquire and transfer a senior water right within the same basin as your proposed project.

- Develop a rainwater catchment system or obtain a trucked water supply to serve your domestic or commercial needs.
- Mitigate: landowners can develop an individual mitigation proposal, or wait for Ecology to establish basin-wide mitigation options.

Pending water right applications in this watershed

At this time, Ecology is not processing any new water right applications and is focusing on developing mitigation programs in the Skagit basin. However, landowners who wish to acquire a water right can still submit an application with Ecology.

Washington water law is based on the "prior appropriation" system, often called "first in time, first in right." Applications for water from the same source must be processed in the order they are received. (There are certain exceptions, see "Additional options for processing water right applications".)

Ecology asks anyone who needs a water right (new, change, or transfer) to submit the pre-application consultation form and meet with us to review your water supply needs and project proposal.

- Apply for a New Water Right
- Apply to Change or Transfer a Water Right or Claim

The map on the last page shows some of the factors that will be considered when evaluating water right permit applications. Here are some additional information sources to assist you with your research:

- Locate and research water rights on land parcels anywhere in the state (Water Resource Explorer)
- Pending Water Right Applications by County
- Subscribe to a water right application RSS feed for a county or WRIA
- WRIA map showing the total number of water right claims, certificates, permits and applications
- Search and view well reports using a map or text search tools (WA State Well Log Viewer)

For more information

Northwest Regional Office
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Bellevue WA 98008
425-649-7000

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Skagit Instream Flow Rule: Affected Areas and Water Availability

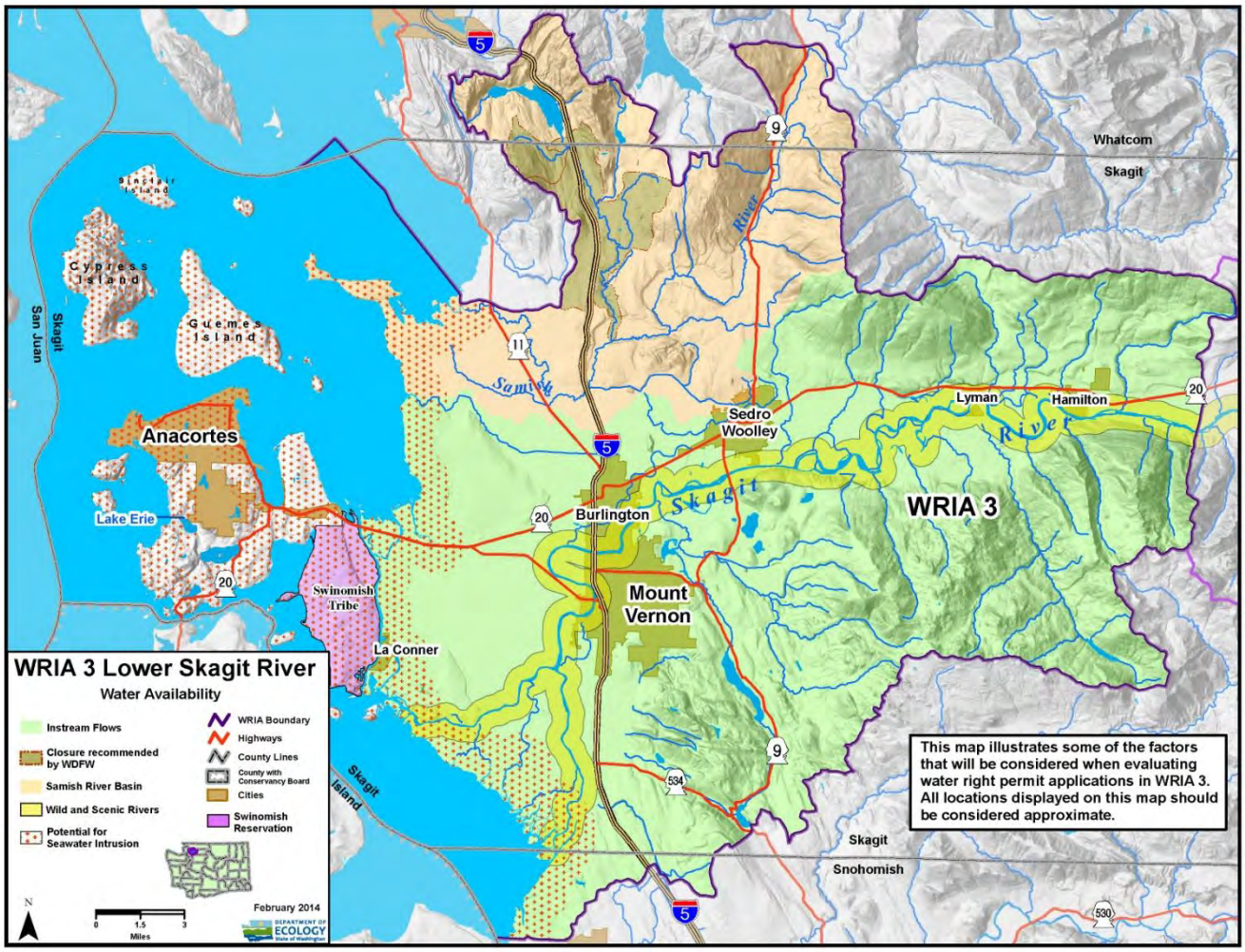

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TABLE OF CONTENTS

- **Description** **p.1**
- **Audience** **p.1**
- **Impact Factor** **p.1**
- **Abstracting and Indexing** **p.2**
- **Editorial Board** **p.2**
- **Guide for Authors** **p.4**

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The mobility of long-runout landslides

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Abstract

Several issues relevant to the mobility of long-runout landslides are examined. A central idea developed in this paper is that the apparent coefficient of friction (ratio of the fall height to the runout distance) commonly used to describe landslide mobility is physically meaningless. It is proposed that the runout distance depends primarily on the volume and not on the fall height, which just adds scatter to the correlation. The negative correlation observed between the apparent coefficient of friction and the volume is just due to the fact that, on the gentle slopes on which landslides travel and come to rest, a large increase in runout distance due to a large volume corresponds to a small increase in the total fall height, hence to a decrease in the apparent coefficient of friction. It is shown that the spreading of a fluid-absent, granular flow is not able to explain the large runout distances of landslides, and in particular does not allow the centre of mass to travel further than expected for a sliding block. This contrasts with the behaviour of natural landslides, for which the centre of mass is shown to travel much further than expected from a simple Coulomb model. The presence of an interstitial fluid which can partly or entirely support the load of particles allows the effective coefficient of solid friction to be reduced or even suppressed. Air is not efficient for fluidising large landslides and a loose debris cannot slide over a basal layer of entrapped and compressed air, as air would rapidly pass through the debris in the form of bubbles during batch sedimentation. Water is much more efficient as a fluidising medium due to its higher density and viscosity, and its incompressibility. As water is known to enhance the mobility of the saturated debris flows, it is proposed that water is also responsible for the long runout of landslides. This is consistent with the fact that the increase in runout with volume is similar for debris flows and landslides. Field evidence suggests that most landslides are unsaturated with water but not dry, even on Mars. Comparison of the velocity of well-documented landslides with that predicted by fluid-absent, granular models shows that these models predict landslides that are much faster and less responsive to topography than natural ones. The relatively low velocities of landslides suggest that energy dissipation is dominated by a velocity-dependent stress and that the coefficient of solid friction is very low. This is consistent with the physics of fluidised or partly fluidised debris and suggests that landslide velocity may be controlled by local slope and flow thickness rather than by the initial fall height. In the absence of a supply of fluid at the base, fluidisation requires a net downward flux of sediment, implying some deposition at the base of landslides, which may thus progressively run out of material. In such a model, the spreading of the portion of a landslide beyond a certain distance would primarily depend on the volume passing this distance and not on the total volume of the landslide. Landslide deposits may therefore have self-similar shapes, in which the area covered beyond a certain distance is a constant function of the volume beyond that distance. It is shown that the shape of some well-documented landslide deposits is in reasonable agreement with this prediction. One consequence is that, as recently proposed for debris flows, assessment of hazards related to landslides should

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Keywords: Landslide; Debris flow; Granular flow; Pore pressure

1. Introduction

Long-runout landslides are common geological features in a variety of environments. Their deposits are found in volcanic and non-volcanic terrains, subaerial and submarine settings, and even on Mars and on the Moon. Their volumes range from 10^5 to 10^{11} m^3 in terrestrial, subaerial settings, and up to 10^{13} m^3 for submarine and extraterrestrial landslides. A defining characteristic of long-runout landslides is that they travel further than expected from simple frictional models. This high mobility, which makes these phenomena very hazardous, was first noted by Heim (1932) and has much intrigued geologists since.

Many hypotheses have been put forward to explain the long runout of landslides. They are briefly summarised below but the reader is also referred to the review by Shaller and Smith-Shaller (1996). Several hypotheses have invoked the presence of a fluidising medium such as air, water, vapour, volcanic gases or a suspension of fine particles. Kent (1966) proposed that entrapped air could fluidise landslides. Shreve (1968a,b) and Fahnestock (1978) suggested that a cushion of entrapped air would support landslides rather than fluidise them. Hsü (1975) hypothesised that the fine particles alone, without the help of a supporting fluid, could fluidise the coarser, moving debris. In some specific volcanic landslides, fluidisation by volcanic gases has been proposed (Voight et al., 1983). Goguel (1978) showed that vaporisation of water at the base of landslides could produce pore pressure in excess of lithostatic and thus strongly reduce friction. Johnson (1978) and Voight and Sousa (1994) presented evidence for the presence of a water-saturated base in, respectively, the Blackhawk and the Ontake-san landslides, and proposed an emplacement mechanism similar to that of debris flows. At the opposite, some authors have attempted to explain landslide mobility with fluid-absent, granular models. The proposed hypotheses include acoustic fluidisation (Melosh, 1979), spreading of a rapid granular flow (Davies, 1982; Straub, 1997), self-lubrication (Campbell, 1989; Cleary and Campbell, 1993; Straub, 1996), and spreading of a granular flow in a regime transitional between frictional and collisional (Campbell et al., 1995). The mobility of landslides has also been considered using continuum models with bulk rheological properties such as viscosity and yield strength, without specific assumptions about the microscopic physics (e.g., Voight et al., 1983; McEwen and Malin, 1989; McEwen, 1989; Dade and Huppert, 1998; Takarada et al., 1999). Models which take into account changes of mass due to deposition or bulking have also been offered (Cannon and Savage, 1988; Van Gassen and Cruden, 1989; Voight and Sousa, 1994; Hungr and Evans, 1997). While many of the mechanisms invoked may have been important in some specific landslide events, none of them has been widely recognised as a universal explanation for landslide mobility, and the debate continues.

This paper re-examines several important issues regarding landslide mobility, including the relationships between volume, area, runout distance, fall height, and apparent coefficient of friction for landslides in different environments, the possible role of air, water or particle suspension as a fluidising medium on the Earth, Mars and the Moon, the ability of fluid-absent, granular models to explain landslide mobility, the velocity of landslides and the control exerted by topography, and the mass distribution and thickness profile in the deposits.

2. Relationships between fall height, runout distance, area and volume

2.1. Uncertainties on the data

Before examining the general relationships between landslide fall height, runout distance, area and volume, it is useful to wonder whether the estimates of these variables are not biased and whether they are accurate enough. The volume of landslide is generally estimated by multiplying the area covered by the deposit

by an estimated average thickness. Area as well as length is likely to be estimated fairly accurately, even for submarine or extraterrestrial deposits. In contrast, thickness is often well constrained at the distal end of the deposit only. Young landslide deposits have seldom been sufficiently dissected to offer cross-sections down to their base and the unknown previous topography makes it difficult to estimate the volume. For old landslide deposits where erosion has been important, the volume lost can be difficult to estimate. When there is some uncertainty, most authors choose to present minimum estimates. As thickness tends to decrease with distance from source, volumes extrapolated from the distal thickness are likely to be underestimates. For some landslides on Mars, multiplying the distal thickness by the area yields volume estimates up to one order of magnitude less than the volume of the corresponding scar (McEwen, 1989). On the Earth, we may expect that field control allows more accurate volume estimates. As the volumes of long-runout landslides cover a wide range from 10^5 to 10^{13} m^3, an uncertainty generally much less than one order of magnitude is acceptable for the purpose of investigating the effect of volume on mobility.

2.2. Translation of the centre of mass

Data available on the distance travelled by landslides usually consist of the runout distance, L_{max}, and the total drop height, H_{max} (Fig. 1). These are the easiest parameters to measure and they are probably estimated with less than 20% of relative error in most cases. However, in many physical analyses of landslide emplacement, the parameters of interest are not H_{max} and L_{max} but H and L, the height lost and distance travelled by the centre of mass. One particularly interesting question is whether the low apparent friction coefficient computed for many landslides is not simply due to the fact that H_{max}/L_{max} is considered instead of H/L. This is essentially the idea of Davies (1982), who suggested that the low H_{max}/L_{max} ratios observed were due to landslide spreading with a "normal" coefficient of friction, represented by H/L.

There are few deposits for which H and L have been estimated, but, nevertheless, for any landslide deposit of known H_{max} and L_{max}, we can test Davies' hypothesis by calculating the thickness profile necessary for H/L to be equal to the "normal" coefficient of friction (~ 0.6). For example, for large landslides which have typical H_{max}/L_{max} ratios of about 0.1, L should be about one sixth of L_{max} in order to get an H/L ratio of about 0.6, if we consider that $H \sim H_{max}$. One may consider several simple geometries (Fig. 2). For a deposit confined in a channel with vertical walls, a linear decrease of thickness with distance from source would yield $L = L_{max}/3$. Assuming an exponential thinning, the condition $L = L_{max}/6$ would be obtained for a deposit more than 100 times thicker at its proximal end than at its distal end. For unconfined, radially spread deposits, the width of the deposit increases with distance from source and L tends to be closer to L_{max} than for the two-dimensional case.

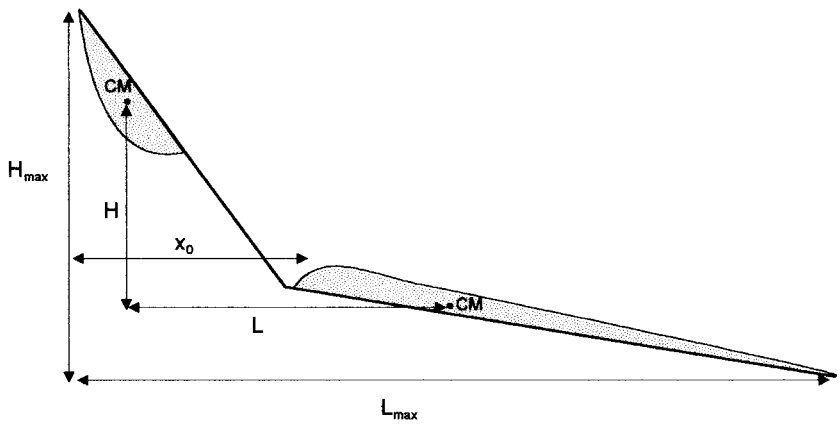

Fig. 1. Sketch of landslide deposit and failing mass and definition of the parameters x_0, H, L, H_{max} and L_{max} used in this paper. CM indicates the centre of mass of the failing mass and the deposit.

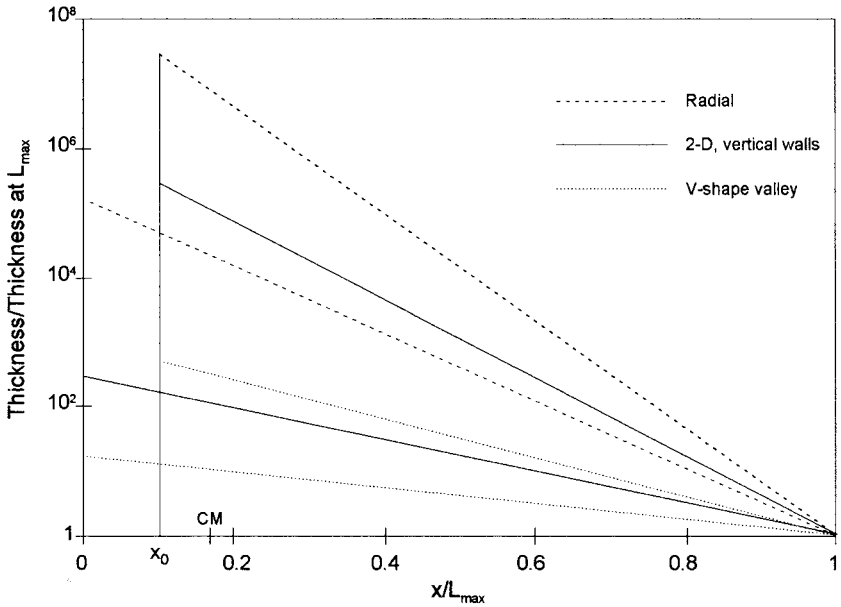

Fig. 2. Thickness of a landslide deposit such that the centre of mass (CM) is at a distance $L = L_{max}/6$ from the origin, assuming an exponential thickness profile and three simple geometries: a radially spread deposit, a deposit channelled in a valley with vertical walls (2D case) and a deposit in a V-shape valley. Thickness profiles are presented for the case where the deposit starts from the origin and for the more typical case where there is a distance $x_0 = L_{max}/10$ between the origin and the proximal end of the deposit. Natural landslide deposits do not show such high thinning rates and proximal thicknesses, suggesting that $L >> L_{max}/6$ for most of them and so that landslides with $H_{max}/L_{max} \leq 0.1$ have $H/L << 0.6$.

The condition $L = L_{max}/6$ therefore requires a greater exponential thinning rate, with a proximal end of the deposit up to 10^5 times thicker than the distal end. (Note that, for a radially spread deposit, strictly the concept of distance of the centre of mass becomes meaningless, as it is clear that the centre of mass of an hypothetical deposit extending over 360° would be at its origin. Instead, L is the average distance travelled.) Deposits channelled in V-shape valleys may have a width which decreases with distance from source, as their width would be proportional to their thickness. It can be shown that for a linear decrease of thickness, such deposits would have $L = L_{max}/4$. Assuming exponential thinning, the condition $L = L_{max}/6$ would be attained for a deposit 20 times thicker at its proximal end than at its distal end.

In practice, there is often a significant distance between the origin and the proximal end of the deposit (x_0), and/or the maximum thickness of deposit does not occur at the proximal end (Fig. 1). Table 1 shows that, for well-documented landslide deposits, x_0 is generally greater than $L_{max}/10$. For $x_0 = L_{max}/10$, Fig. 2 shows that, in order to maintain $L = L_{max}/6$, the thinning rate and hence the proximal thickness of deposit must still be higher, and this conclusion should hold whatever the exact shape of the deposit. Such very high proximal thicknesses (more than 100 times the distal thicknesses for the most favourable geometry) are not typical of landslide deposits. Moreover, in some landslides, the thickness of the proximal deposit is artificially increased by the accumulation of material from less mobile pulses during multiple retrogressive failure (e.g., at Mount St. Helens, Voight et al., 1983). In some cases, the distance x_0 is even greater than the theoretical distance L for a friction coefficient of 0.6, which means that the whole deposit lies beyond the distance predicted for its centre of mass by a simple frictional model. This occurs for the Blackhawk landslide deposit, which lies between 2 and 9 km from its origin, while, in order to get $H/L = 0.6$, L should be less than 2 km (Johnson, 1978). From Johnson's data, L can be estimated to be about 6 km, only 1.5 times less than L_{max}. The same occurs for the giant Mount Shasta landslide (Crandell, 1988),

Table 1
Comparison between H/L and H_{max}/L_{max} for several landslide deposits

	L_{max} (km)	H_{max}/L_{max}	L (km)	H/L	V (km^3)	x_0/L_{max}
Blackhawk (1)	9	0.13	5–6[a]	0.20–0.17[a]	0.3	0.22
Elm (2)	2	0.3	0.8–1[a]	0.42	0.01	0.25
Lastarria (3)	6.7	0.15	3–4[a]	0.20–0.15[a]	0.09	0.3[a]
Mount St. Helens (4)	23	0.09	8–12[a]	0.25–0.12[a]	2.8	0.2[a]
Nevado de Colima (5)	120	0.04	30–50[a]	0.13–0.06[a]	22–33	0.04[a]
Shasta (6)	49	0.07	20–30[a]	0.15–0.07[a]	45	0.16[a]
Sherman (7)	6	0.22	3–4[a]	0.19	0.01	0.16[a]

References are as follows: (1) Johnson (1978), (2) Hsü (1975), (3) Naranjo and Francis (1987), (4) Voight et al. (1983), (5) Stoopes and Sheridan (1992), (6) Crandell (1988), (7) McSaveney (1978). H_{max}, L_{max}, H, L, and x_0 are defined in Fig. 1.

[a] Estimated in this paper.

where x_0 ($\sim$10 km) is much greater than $H/0.6$ ($\sim$5 km). Subdivision of the deposit by Crandell in seven areas, each with an estimated mean thickness, allows us to estimate a mean travelled distance L of about 27 km, only two times less than L_{max}.

In the above calculations, it was assumed that H was equal to H_{max}. In fact, the drop height measured from the distance L is always less than that measured from the distal end of the deposit. In addition, we should consider the centre of mass of the failing block rather than its highest point, so H is likely to be significantly less than H_{max}, so as to substantially reduce H/L. For a few well-documented deposits, H/L can be estimated with some confidence (Table 1). For example, Naranjo and Francis (1987) describe a landslide at Lastarria volcano (Chile) with $H_{max} \sim 1$ km and $L_{max} \sim 6.7$ km. From their data, the drop height of the centre of mass can be estimated to 0.6 km and the average travelled distance to 3–4 km, which suggests that H_{max}/L_{max} ($\sim$0.15) is actually a good estimate for H/L (0.15–0.20) in this case. In the case of the Blackhawk landslide, the ratio H/L is about 0.20–0.17, not dramatically higher than H_{max}/L_{max} ($\sim$0.13). For the Elm landslide, Hsü (1975) reports $H_{max}/L_{max} \sim 0.3$ and $H/L \sim 0.42$, while for the Sherman landslide, McSaveney (1978) estimates that H/L ($\sim$0.19) is in fact less than H_{max}/L_{max} ($\sim$0.22). Therefore, there seems to have little doubt that, for most landslides, the low H_{max}/L_{max} ratio cannot be explained by frictional spreading of the mass with a normal friction coefficient. Instead, the centre of mass does travel further than predicted by a frictional model with a normal friction coefficient, and travels further for larger landslides. This last point can be illustrated by the giant landslide of Nevado de Colima, which travelled 120 km before entering the Pacific Ocean, with an estimated H_{max}/L_{max} of about 0.04 (Stoopes and Sheridan, 1992). If we estimate conservatively that the centre of mass travelled only 35 km, we still have an H/L ratio of about 0.1, lower than the H/L and even H_{max}/L_{max} ratios observed for most small landslides. A similar value of H/L is found for the giant landslide of Mount Shasta (Table 1).

2.3. Dependence of runout on fall height and volume

It is well known that, when data from many landslides (Table 2) are plotted in a graph of H_{max}/L_{max} versus volume, the ratio H_{max}/L_{max} shows a tendency to decrease with increasing volume, from a value of about 0.6, expected for a purely frictional slide, at volumes smaller than 10^5 m^3, to values lower than 0.1 for volumes in excess of 1 km^3 (Fig. 3a). Although unquestionable, this trend shows a large scatter. Davies (1982) proposed that the actual runout of a landslide is essentially controlled by its spreading, hence by its volume. He showed that a plot of runout versus volume gives a better correlation (Fig. 3b; Table 3), and suggested that drop height is of secondary importance and just adds scatter to the correlation. In a set of experiments using bentonite as an analogue material for landslides, Hsü (1975) showed that the height from which a given volume was released had no influence on the runout distance and total area of the final deposit, which were only dependent on the volume. There is an additional reason to question the physical significance of the H_{max}/L_{max} or H/L ratio. The use of this

Table 2
Estimated volume (V), runout distance (L_{max}), fall height (H_{max}), area (A) and apparent coefficient of friction (H_{max}/L_{max}) for 203 landslide and debris-flow deposits in a variety of environments

	V (km^3)	L_{max} (km)	H_{max} (km)	A (km^2)	H_{max}/L_{max}	References
Subaerial non-volcanic landslides						
Blackhawk	0.28	9.6	1.2		0.125	Hayashi and Self (1992)
Corno di desde	0.02	3.7	1.2		0.324	Hayashi and Self (1992)
Deyen, Glarus	0.6	6.6	0.74		0.112	Hayashi and Self (1992)
Diablerets	0.05	5.5	1.9		0.345	Hayashi and Self (1992)
Disentis	0.015	2.1	0.74		0.352	Hayashi and Self (1992)
Elm	0.01	2.3	0.71		0.309	Hayashi and Self (1992)
Engelberg	2.75	7.4	1.6		0.216	Hayashi and Self (1992)
Fernpass	1	15.6	1.4		0.090	Hayashi and Self (1992)
Flims	12	15.6	2		0.128	Hayashi and Self (1992)
Frank	0.03	3.5	0.87		0.249	Hayashi and Self (1992)
Garnish	0.8	7.5	1.9		0.253	Hayashi and Self (1992)
Goldau	0.035	6	1.2		0.200	Hayashi and Self (1992)
Gros Ventre	0.038	3.4	0.56		0.165	Hayashi and Self (1992)
Kandertal	0.14	9.9	1.9		0.192	Hayashi and Self (1992)
Maligne Lake	0.5	5.47	0.92		0.168	Hayashi and Self (1992)
Medicine Lake	0.086	1.22	0.32		0.262	Hayashi and Self (1992)
Madison	0.029	1.6	0.43		0.269	Hayashi and Self (1992)
Mombiel	0.0008	0.8	0.37		0.463	Hayashi and Self (1992)
Obersee GL	0.12	5	1.8		0.360	Hayashi and Self (1992)
Pamir	2	6.2	1.5		0.242	Hayashi and Self (1992)
Poshivo	0.15	4.1	1.5		0.366	Hayashi and Self (1992)
Saidmarreh	20	18.9	1.5		0.079	Hayashi and Self (1992)
Schächental	0.0005	3.1	1.8		0.581	Hayashi and Self (1992)
Scimada Saoseo	0.08	5.5	1.5		0.273	Hayashi and Self (1992)
Sherman	0.03	6.2	1.3		0.210	Hayashi and Self (1992)
Siders	1.5	17.4	2.4		0.138	Hayashi and Self (1992)
Tamins	1.3	13.5	1.3		0.096	Hayashi and Self (1992)
Vaiont	0.25	1.5	0.5		0.333	Hayashi and Self (1992)
Val Lagone	0.00065	2.4	1.05		0.438	Hayashi and Self (1992)
Voralpsee	0.03	3.4	1.1		0.324	Hayashi and Self (1992)
Wengen 1	0.0025	1.1	0.5		0.455	Hayashi and Self (1992)
Wengen 2	0.0055	1.4	0.59		0.421	Hayashi and Self (1992)
Subaerial volcanic landslides						
Akagi	4	19	2.4		0.126	Hayashi and Self (1992)
Asakusa	0.04	6.5	1		0.154	Hayashi and Self (1992)
Asama	2	20	1.8	90[a]	0.090	Hayashi and Self (1992)
Bandai-san 1888	1.5	11	1.2	34[a]	0.109	Hayashi and Self (1992)
Bezymianni 1956	0.8	18	2.4	30[a]	0.133	Hayashi and Self (1992)
Callaqui	0.15	15	3.1		0.207	Hayashi and Self (1992)
Chaos Crags	0.15	5	0.65	8[a]	0.130	Hayashi and Self (1992)
Chimborazo	8.1	35	3.6		0.103	Hayashi and Self (1992)
Chokai	3.5	25	2.2		0.088	Hayashi and Self (1992)
Colima	12.5	40	4	900[a]	0.100	Hayashi and Self (1992)
Egmont (Pungarehu)	7.5	31	2.6	250[a]	0.084	Hayashi and Self (1992)
Egmont (Opua)	0.35	27	2.5	120[a]	0.093	Hayashi and Self (1992)
Fuji	1.8	24	2.5		0.104	Hayashi and Self (1992)
Galunggung	2.9	25	1.9	175[a]	0.076	Hayashi and Self (1992)
Iriga	1.5	11	1.05	65[a]	0.095	Hayashi and Self (1992)
Iwaki	1.3	14	1.6		0.114	Hayashi and Self (1992)
Komagatake	0.25	11.5	1		0.087	Hayashi and Self (1992)

Table 2 (*continued*)

	V (km^3)	L_{max} (km)	H_{max} (km)	A (km^2)	H_{max}/L_{max}	References
Subaerial volcanic landslides						
Kurohime	0.12	6	0.8		0.133	Hayashi and Self (1992)
Mageik	0.09	9	0.8		0.089	Hayashi and Self (1992)
Mawenzi	7.1	60	4.5	1150[a]	0.075	Hayashi and Self (1992)
Meru	15	50	3.9	1400[a]	0.078	Hayashi and Self (1992)
Monbacho	1	12	1.3	45[a]	0.108	Hayashi and Self (1992)
Mt. St. Helens 1980	2.5	24	2.55	60[a]	0.106	Hayashi and Self (1992)
Myoko (Sekikawa)	0.8	19	2		0.105	Hayashi and Self (1992)
Myoko (Taguchi)	0.23	8	1.4	10[a]	0.175	Hayashi and Self (1992)
Ovalnaya Zimina	0.4	17	2.4		0.141	Hayashi and Self (1992)
Papandayan	0.14	11	1.5		0.136	Hayashi and Self (1992)
Peteroa	16	85	3.9		0.046	Hayashi and Self (1992)
Popa	0.8	11	1.2		0.109	Hayashi and Self (1992)
Popocatepetl	28	33	4		0.121	Hayashi and Self (1992)
Shasta	26	50	3.55	450[a]	0.071	Hayashi and Self (1992)
Shiveluch	1.5	12	2	98[a]	0.167	Hayashi and Self (1992)
Sierra Velluda	0.5	25	3.4		0.136	Hayashi and Self (1992)
Socompa	17	35	3.25	480[a]	0.093	Hayashi and Self (1992)
Tashiro	0.55	8.8	0.7		0.080	Hayashi and Self (1992)
Tateshina	0.35	12.5	1.4		0.112	Hayashi and Self (1992)
Unzen	0.34	6.5	0.85	12[a]	0.131	Hayashi and Self (1992)
Usu	0.3	6.5	0.5		0.077	Hayashi and Self (1992)
Yatsugatake (Nirasaki)	9	32	2.4		0.075	Hayashi and Self (1992)
Yatsugatake (Otsukigawa)	0.27	12.5	1.4		0.112	Hayashi and Self (1992)
Soufrière Guadeloupe	0.5	9.5	1.35	25	0.142	Siebert (1984)
St. Helens 20000 BP	1	16	1.75		0.109	Siebert (1984)
Vesuvius 1944	0.000179	0.64	0.575	0.022	0.898	Hazlett et al. (1991)
Vesuvius 1944	0.0009	0.94	0.505	0.113	0.537	Hazlett et al. (1991)
Vesuvius 1944	0.00055	0.5	0.285	0.099	0.570	Hazlett et al. (1991)
Vesuvius 1944	0.000793	0.96	0.47	0.126	0.490	Hazlett et al. (1991)
Vesuvius 1944	0.001	1.24	0.636	0.136	0.513	Hazlett et al. (1991)
Vesuvius 1944	0.0011	0.68	0.36	0.145	0.529	Hazlett et al. (1991)
Vesuvius 1944	0.00116	0.82	0.41	0.161	0.500	Hazlett et al. (1991)
Jocotitlán	2.8	12	1.15	80	0.110	Siebe et al. (1992)
Submarine landslides						
Grant Banks	76	110	0.365		0.003	Hampton et al. (1996)
Hawaii		160	2		0.013	Hampton et al. (1996)
Kidnappers	8	11	0.05		0.005	Hampton et al. (1996)
Bay of Biscay		21	0.25		0.012	Hampton et al. (1996)
Rockall	300	160	0.33		0.002	Hampton et al. (1996)
Bassein		37	0.36		0.010	Hampton et al. (1996)
Agulhas		106	0.375		0.004	Hampton et al. (1996)
Copper River delta		18	0.115		0.006	Hampton et al. (1996)
Albatross Bank		5.3	0.3		0.057	Hampton et al. (1996)
Portlock Bank		6.5	0.2		0.031	Hampton et al. (1996)
Kayak trough		15	0.115		0.008	Hampton et al. (1996)
Atlantic Coast		3.4	0.03		0.009	Hampton et al. (1996)
		4.8	0.08		0.017	Hampton et al. (1996)
		2.3	0.018		0.008	Hampton et al. (1996)
Magdalena	0.3	24	1.4		0.058	Hampton et al. (1996)
Valdez	0.075	1.28	0.168		0.131	Hampton et al. (1996)

(*continued on next page*)

Table 2 (*continued*)

	V (km^3)	L_{max} (km)	H_{max} (km)	A (km^2)	H_{max}/L_{max}	References
Submarine landslides						
Mississippi River delta	0.04		0.02			Hampton et al. (1996)
Suva	0.15		0.1			Hampton et al. (1996)
Scripps Canyon	0.00005		0.006			Hampton et al. (1996)
Orkdalsfjord	0.025	22.5	0.5		0.022	Hampton et al. (1996)
Sandnesjoen	0.005	1.2	0.18		0.150	Hampton et al. (1996)
Sokkelvik	0.0005	2.5	0.12		0.048	Hampton et al. (1996)
Helsinki	0.000006	0.4	0.011		0.028	Hampton et al. (1996)
Storegga	800	160	1.7		0.011	Hampton et al. (1996)
Typical Atlantic Ocean		4	1.2		0.300	Hampton et al. (1996)
Cape Fear		30	0.7		0.023	Hampton et al. (1996)
Blake Escarpment	600	42	3.6		0.086	Hampton et al. (1996)
East Break East	13	70	1.15		0.016	Hampton et al. (1996)
East Break West	160	110	1.1		0.010	Hampton et al. (1996)
Navarin Canyon	5	6	0.175		0.029	Hampton et al. (1996)
Seward	0.0027	3	0.2		0.067	Hampton et al. (1996)
Alsek		2	0.02		0.010	Hampton et al. (1996)
Sur	10	70	0.75		0.011	Hampton et al. (1996)
Santa Barbara	0.02	2.3	0.12		0.052	Hampton et al. (1996)
Alika-2[b]	300	95	4.8		0.051	Hampton et al. (1996)
Nuuanu[b]	5000	230	5		0.022	Hampton et al. (1996)
Tristan de Cunha[b]	150	50	3.75		0.075	Hampton et al. (1996)
Kitimat slide	0.2	6	0.2		0.033	Lipman et al. (1988)
A1	250	370	1.7		0.005	Lipman et al. (1988)
A2	22	160	1.5		0.009	Lipman et al. (1988)
A3	8.5	140	1.4		0.010	Lipman et al. (1988)
A4A	27	130	1.3		0.010	Lipman et al. (1988)
A4B	320	400	2		0.005	Lipman et al. (1988)
Kae Lae slide[b]	40	60	5		0.083	Lipman et al. (1988)
Molokai slide[b]	1100	130	5.2		0.040	Lipman et al. (1988)
Oahu slide[b]	1800	180	5.5		0.031	Lipman et al. (1988)
Alika slide[b]	1800	105	5.3		0.050	Lipman et al. (1988)
Martian landslides						
Unnamed	17880	119	7	4716	0.059	McEwen (1989)
Unnamed		56	2.4		0.043	McEwen (1989)
Unnamed	4880	70	7	1175	0.100	McEwen (1989)
Unnamed	4183	82	8.4	1244	0.102	McEwen (1989)
Unnamed	4047	94	6.8	2200	0.072	McEwen (1989)
Unnamed		52	4.4		0.085	McEwen (1989)
Unnamed	3267	76	7.2	1287	0.095	McEwen (1989)
Unnamed	2960	64	8	1675	0.125	McEwen (1989)
Unnamed	2761	63	6.8	1144	0.108	McEwen (1989)
Unnamed		50	5.4		0.108	McEwen (1989)
Unnamed	1282	63	8.2	1244	0.130	McEwen (1989)
Unnamed	833	56	5.4	1075	0.096	McEwen (1989)
Unnamed	688	45	3.6	888	0.080	McEwen (1989)
Unnamed	668	31	4.4	656	0.142	McEwen (1989)
Unnamed	655	54	7.6	470	0.141	McEwen (1989)
Unnamed	321	36	5.4	312	0.150	McEwen (1989)
Unnamed	157	33	2.8	325	0.085	McEwen (1989)
Unnamed	32	29	3.6	125	0.124	McEwen (1989)
Unnamed	29	20	4	350	0.200	McEwen (1989)
Unnamed	98[c]	18	2	175	0.111	McEwen (1989)

Table 2 (*continued*)

	V (km^3)	L_{max} (km)	H_{max} (km)	A (km^2)	H_{max}/L_{max}	References
Martian landslides						
Unnamed	11	8	1.2	44	0.150	McEwen (1989)
Unnamed	38.5[c]	21	6.4	84	0.305	McEwen (1989)
Unnamed	37.1[c]	20	6.2	81	0.310	McEwen (1989)
Unnamed	30.1[c]	19	6.2	66	0.326	McEwen (1989)
Unnamed	23.1[c]	16	5	50	0.313	McEwen (1989)
Unnamed	9.8[c]	17	6.2	22	0.365	McEwen (1989)
Unnamed	6.3[c]	7	2.2	13	0.314	McEwen (1989)
Unnamed	2.1[c]	6	2.2	4	0.367	McEwen (1989)
Unnamed	0.7[c]	8	4.2	3	0.560	McEwen (1989)
Debris flows						
Osceola	3.8			550		Iverson et al. (1998)
Tetelzingo	1.8			140		Iverson et al. (1998)
Electron	0.25			60		Iverson et al. (1998)
Round Pass	0.2			50		Iverson et al. (1998)
Dead Man Flat	0.18			90		Iverson et al. (1998)
National	0.15			78		Iverson et al. (1998)
Paradise	0.1			34		Iverson et al. (1998)
Zigzag	0.073			55		Iverson et al. (1998)
Trout Lake	0.066			27		Iverson et al. (1998)
Middle Fork Nooksack	0.05			20		Iverson et al. (1998)
Kautz Creek	0.04			4.5		Iverson et al. (1998)
Azufrado	0.04			34		Iverson et al. (1998)
Molinos Nereidas	0.03			6		Iverson et al. (1998)
Guali	0.016			11		Iverson et al. (1998)
Salt Creek	0.015			16		Iverson et al. (1998)
Tahoma	0.015			6		Iverson et al. (1998)
Oine Creek + Muddy River	0.014			18		Iverson et al. (1998)
South Fork Toutle	0.012			30		Iverson et al. (1998)
Whitney Creek	0.004			8		Iverson et al. (1998)
Bolum Creek	0.0015			3		Iverson et al. (1998)
Mabinit Eruption Lahars	0.0012			1.8		Iverson et al. (1998)
Tahoma Creek	0.0006			1		Iverson et al. (1998)
Blue Lake	0.00038			0.75		Iverson et al. (1998)
Butte Canyon	0.00038			0.5		Iverson et al. (1998)
Mabinit Typhoon Saling	0.0003			0.2		Iverson et al. (1998)
Middle Fork Nooksack	0.00014			0.4		Iverson et al. (1998)
Polallie Creek	0.00008			0.47		Iverson et al. (1998)
West Dodson	0.00008			0.1		Iverson et al. (1998)
Mayflower Gulch	0.000017			0.016		Iverson et al. (1998)
B1	0.0000003			0.002		Iverson et al. (1998)
N32	0.0000001			0.0006		Iverson et al. (1998)
N2	0.00000001			0.0002		Iverson et al. (1998)
USGS flume experiments	0.00000001			0.00025		Iverson et al. (1998)
Chillos Valley Lahar	3.8	326				Mothes et al. (1998)
Osceola	1	120				Iverson (1997)
Huascaran	0.1	120				Iverson (1997)
South Fork Toutle	0.01	44				Iverson (1997)
Muddy River	0.01	31				Iverson (1997)
Wrightwood	0.001	24				Iverson (1997)
Three Sisters	0.001	6				Iverson (1997)

(continued on next page)

Table 2 (*continued*)

	V (km^3)	L_{max} (km)	H_{max} (km)	A (km^2)	H_{max}/L_{max}	References
Debris flows						
Mount Thomas	0.0001	3.5				Iverson (1997)
Guali	0.016	103				Pierson et al. (1990)
Molinos Nereidas	0.03	69				Pierson et al. (1990)
Azufrado	0.04	69				Pierson et al. (1990)
Lagunillas	0.004	56				Pierson et al. (1990)

[a] Area estimate from Siebert (1984).
[b] Volcanic submarine landslide.
[c] The volumes estimated by extrapolation from the distal thickness by McEwen (1989) have been multiplied by 7 here. This correction was introduced after checking that, for other Martian landslides for which the volume has been estimated from the scar, the extrapolation from the distal thickness yields volume estimates which are on average seven times smaller, owing to the decrease in thickness with distance from source.

ratio as an indicator of landslide mobility implies that the energy released during the initial fall is dissipated with a constant coefficient of friction and is responsible for the runout distance. As discussed in a later section, models which use a constant coefficient of friction predict landslide velocities much higher than the velocities inferred from the control of their path by topography (Voight et al., 1983; McEwen and Malin, 1989; Voight and Sousa, 1994). The relatively low velocities inferred for natural landslides show that they rapidly dissipate the kinetic energy gained during the initial fall and so "forget" the initial fall height.

If runout essentially depends on volume and not on drop height, why do we observe a positive correlation between H_{max} and L_{max}, and a negative correlation between H_{max}/L_{max} and V? The answer may lie in the fact that landslides are forced to travel downslope on the existing topography, so H_{max} and L_{max} are not independent variables. The slope generally decreases away from the source region. If runout primarily depends on volume, the decrease in apparent friction coefficient with volume can be explained by the gentle slopes on which landslides come to rest. On such slopes, a large increase in L_{max} corresponds to a modest increase in H_{max}, thus to a decrease in H_{max}/L_{max}. The strong positive correlation between H_{max} and L_{max} (Fig. 3c) is traditionally explained by the dependence of L_{max} on H_{max}, through the apparent coefficient of friction. If we believe that L_{max} does not strongly depends on H_{max} but depends essentially on the volume, this correlation can be explained by the fact that H_{max} increases with L_{max}, as landslides travel downslope. An additional explanation is that landslides of great volume can hardly be produced from small scarps, so there must be a positive correlation between H_{max} and V (Fig. 3d) which, together with the positive correlation between L_{max} and V, produces a positive correlation between L_{max} and H_{max}.

2.4. Submarine landslides

In order to gain more insight into the factors that may enhance landslide mobility, it is interesting to compare the relationships between H_{max}, L_{max} and V for landslides occurring in different environments. The graph of H_{max}/L_{max} versus V shows the strikingly different behaviour of submarine landslides, which have much lower H_{max}/L_{max} than all other landslides, with values as low as 0.004 (Fig. 3a). An intuitive explanation would be that submarine landslides are much more mobile, as a consequence of their mixing with large amounts of water. However, when L_{max} is plotted against V, submarine landslides follow exactly the same trend as subaerial ones (Fig. 3b; Table 3). This could be interpreted as due to the compensating effects of higher mobility of the watery debris and gentler submarine slopes. Alternatively, if we follow the rationale that L_{max} is essentially a function of V and that H_{max} has only a minor influence, the similarity between the L_{max} versus V relationships of subaerial and submarine landslides could reveal similar emplacement mechanisms, despite the different environments.

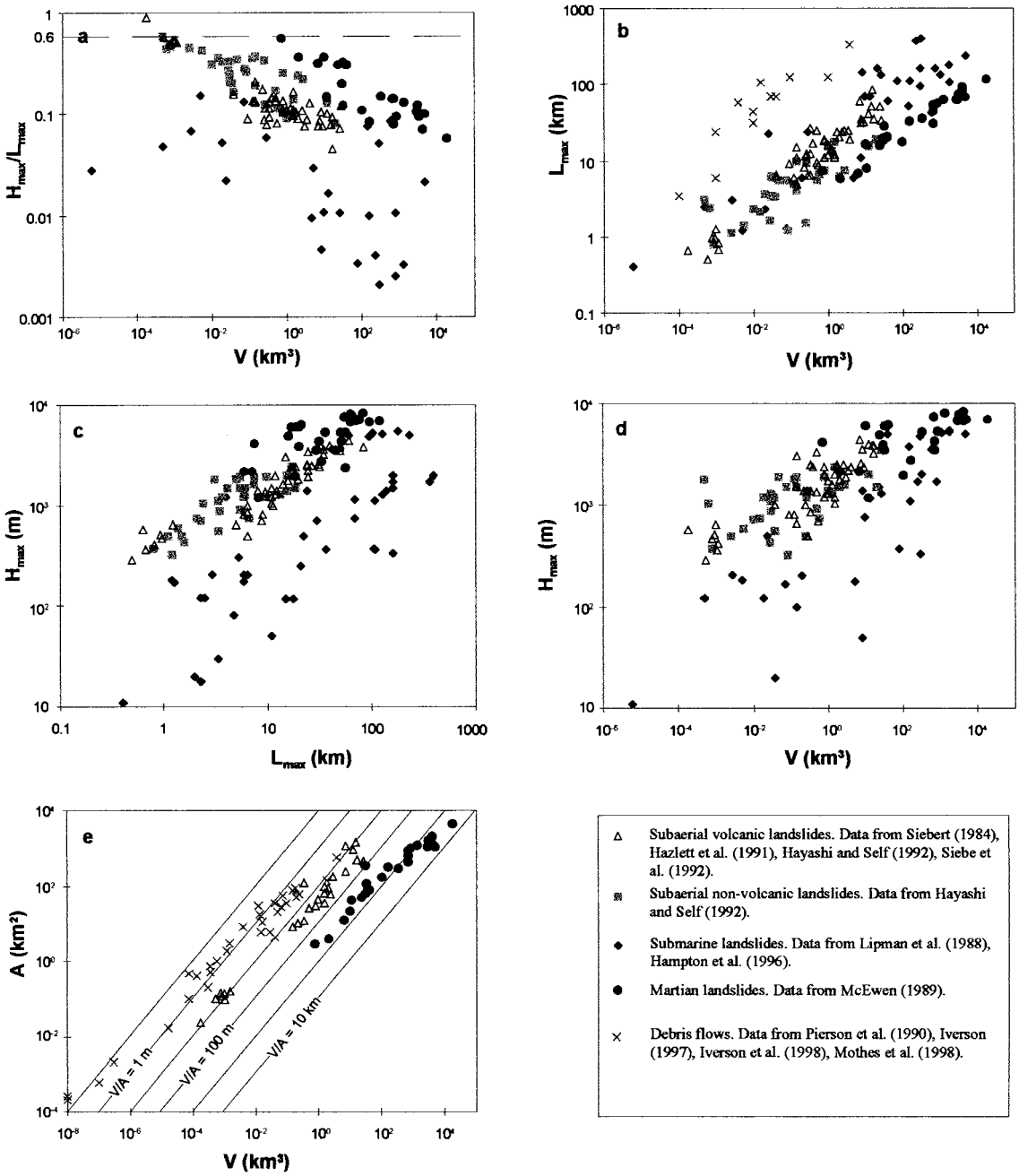

Fig. 3. Relationships between total fall height (H_{max}), runout distance (L_{max}), volume (V) and area covered by the deposit (A) for subaerial volcanic landslides, subaerial non-volcanic landslides, submarine landslides, Martian landslides and debris flows. Some deposits do not have an available estimate for one or more of these parameters, so each graph is based on a different set of data. Data are presented in Table 2. Equations of the best power-law fit to each set of data are presented in Table 3 together with the coefficients of correlation R^2. Lines in (e) indicate average deposit thickness, V/A.

Table 3
Equations of the best power-law fits of data from Fig. 3, and their coefficients of correlation R^2

	Best power-law fit	R^2
Graph of H_{max}/L_{max} versus V (Fig. 3a)		
Non-volcanic landslides	$H_{max}/L_{max}=0.16V^{-0.15}$	0.63
Volcanic landslides	$H_{max}/L_{max}=0.11V^{-0.19}$	0.81
Martian landslides	$H_{max}/L_{max}=0.42V^{-0.19}$	0.73
Submarine landslides	$H_{max}/L_{max}=0.03V^{-0.09}$	0.17
Debris flows	–	–
Graph of L_{max} versus V (Fig. 3b)		
Non-volcanic landslides	$L_{max}=8V^{0.25}$	0.6
Volcanic landslides	$L_{max}=15.6V^{0.39}$	0.91
Martian landslides	$L_{max}=6.2V^{0.34}$	0.92
Submarine landslides	$L_{max}=18V^{0.33}$	0.79
Debris flows	$L_{max}=235V^{0.39}$	0.82
Graph of H_{max} versus L_{max} (Fig. 3c)		
Non-volcanic landslides	$H_{max}=486L_{max}^{0.52}$	0.66
Volcanic landslides	$H_{max}=412L_{max}^{0.53}$	0.85
Martian landslides	$H_{max}=1200L_{max}^{0.38}$	0.42
Submarine landslides	$H_{max}=47L_{max}^{0.73}$	0.63
Debris flows	–	–
Graph of H_{max} versus V (Fig. 3d)		
Non-volcanic landslides	$H_{max}=1310V^{0.09}$	0.2
Volcanic landslides	$H_{max}=1780V^{0.20}$	0.72
Martian landslides	$H_{max}=2660V^{0.11}$	0.36
Submarine landslides	$H_{max}=387V^{0.29}$	0.7
Debris flows	–	–
Graph of A versus V (Fig. 3e)		
Non-volcanic landslides	–	–
Volcanic landslides	$A=55V^{0.87}$	0.97
Martian landslides	$A=6.1V^{0.70}$	0.93
Submarine landslides	–	–
Debris flows	$A=230V^{0.76}$	0.97

Note the generally better R^2 for the graph of L_{max} versus V compared with the graph of H_{max}/L_{max} versus V, and the relatively constant value of the exponent ($\sim 1/3$) in the relation between L_{max} and V for the various types of deposits.

In submarine settings, velocity is partly controlled by the turbulent drag exerted by seawater on landslide surface. As turbulent drag scales with the square of the velocity, any high velocity initially acquired down a steep slope is rapidly lost (Norem et al., 1990). On the other hand, the extent to which water is incorporated to the moving submarine landslide and increases its mobility is unknown. In subaerial settings, it is widely accepted that a landslide in which the water content becomes sufficiently high can transform into a debris flow (e.g., Iverson, 1997), and there are well-documented examples of such transformations, as at Huascarán (Plafker and Ericksen, 1978), Mount St. Helens (Voight et al., 1983), Mount Rainier (Vallance and Scott, 1997), Cotopaxi (Mothes et al., 1998) or Ontake-san volcano (Takarada et al., 1999). Morphologically, debris-flow deposits are distinguished by their longer runout, smaller thickness and smoother surface, generally lacking the hummocks typical of landslide deposits, although deposits with intermediate characteristics are found within this continuum. One would therefore expect that, in submarine settings, landslides rapidly transform into debris flows. Surprisingly, this does not always occur, and many submarine landslide deposits have a morphology more typical of subaerial landslides than of debris flows (Lipman et al., 1988; Moore et al., 1994). Their runout (or area) versus volume relationship also shows that they are less mobile than debris flows and as mobile as subaerial landslides (Fig. 3b; Table 3). These features may suggest that submarine landslides, like subaerial ones, are not fully saturated with water.

For submarine landslides which originate subaerially, the rate of percolation of seawater into the landslide body (q) can be evaluated through the law of Darcy,

$$q=\frac{k}{\eta}\frac{\mathrm{d}P}{\mathrm{d}x}, \tag{1}$$

where k is the permeability of the debris, η is the viscosity of water, and $\mathrm{d}P/\mathrm{d}x$ is the gradient of total mechanical potential of fluid. If the initial pore pressure within the landslide is assumed negligible with respect to hydrostatic pressure, $\mathrm{d}P$ is simply the pressure of the seawater column at the surface of the landslide and $\mathrm{d}x$ is the distance to which water has already penetrated the debris. Permeability of the poorly sorted material involved in landslides and debris flows can vary between 10^{-9} and 10^{-13} m^2 (Voight et al., 1983; Iverson, 1997). In this problem, it seems reasonable to choose values at the lower end of the range as the material would be compressed below water. By using $k=10^{-13}$ m^2 and a pressure of 4000 m of water, the maximum depth where submarine landslides deposits are known, we obtain a percolation rate of only 4 mm s^{-1} once water has penetrated the first metre of debris,

and this rate would rapidly decrease as water penetrates deeper into the debris. This estimates would still be lower if the viscosity of a slurry composed of water plus the finest particles in the debris was used in Eq. (1) instead of the viscosity of clear water. Given typical emplacement times on the order of 1000 s, it seems possible that some large landslides which enter the sea remain unsaturated with water.

Landslides which originate below water must be initially saturated. However, the dilation which accompanies the initiation of some landslides would create a significant pore volume free of water. Alternatively, if submarine landslides are really saturated with water, there must be an unknown mechanism which prevents them from transforming into debris flows.

In any case, the morphological similarities between subaerial and submarine landslide deposits, and their differences with subaerial and submarine debris-flow deposits raise the possibility that submarine landslides have essentially the same dynamics as their subaerial counterparts. In that case, the similar relation between L_{max} and V may simply reflect this fact. The much lower H_{max}/L_{max} ratios for submarine landslides would reflect the gentler slopes on which submarine landslides can be triggered (Hampton et al., 1996).

2.5. Martian landslides

The behaviour of Martian landslides also shows some difference with respect to terrestrial ones. In the graph of H_{max}/L_{max} versus V, Martian landslides have a higher apparent friction coefficient than terrestrial landslides of the same volume (Fig. 3a). If runout does not depend strongly on drop height, this could be partly explained by the very high scarps from which most Martian landslides initiate. Nevertheless, in the graph of L_{max} versus V, Martian landslides still have runouts nearly two times shorter than terrestrial ones for a given volume (Fig. 3b).

McEwen (1989) proposed that the lower mobility of Martian landslides could be explained if landslide runout was controlled by the yield strength of the material. A viscoplastic material which possesses a yield strength spreads on an incline until its thickness becomes less than a threshold value (h_c) which depends on its bulk density (ρ_b), its yield strength (Y), the slope angle (β) and the gravity acceleration (g) (Johnson, 1970; Battaglia, 1993),

$$h_c = \frac{Y}{\rho_b g \sin\beta}. \tag{2}$$

For a given yield strength, landslides on a planet with a greater gravity (the Earth) would spread to a smaller thickness, and thus would have a longer runout. There are however at least two problems with this analysis. First, Eq. (2) neglects landslide inertia and, second, it predicts that the thickness of the deposit should not depend on its volume. The latter is in contradiction with data from both terrestrial and Martian landslides, which show a positive correlation between average thickness and volume (Fig. 3e). Landslides deposits cover areas approximately proportional to $V^{2/3}$ (Hungr, 1990a; Dade and Huppert, 1998), which means that their average thickness is roughly proportional to $V^{1/3}$. If thickness was controlled by yield strength, the positive correlation between thickness and volume would imply that more voluminous landslides have a greater strength, for which there is no apparent reason. Moreover, the thickness of the deposit should be less where the slope is steeper. In contrast, landslide deposits are generally thicker near source, where slope is steeper. Therefore, thickness data from landslide deposits are not consistent with their formation by en masse freezing due to a yield strength. This does not rule out that landslides may indeed possess a yield strength and that their upper part may stop en masse, as suggested by the morphology of their deposits, but sudden freezing of the whole mass when it reaches a critical thickness seems unlikely.

An alternative reason for the lower mobility of Martian landslides is that they probably contain less water than most terrestrial landslides. The role of fluids has often been invoked to explain landslide mobility and will be examined in more details in a later section.

3. Landslides as granular flows

The importance of fluids for landslide mobility has been questioned after the discovery of large landslide deposits on the Moon and on Mars (Howard, 1973;

McEwen, 1989). This has led some authors to explore the possibility that landslides travel as granular flows, without the need of any interstitial fluid (Melosh, 1979; Davies, 1982; Campbell, 1989; Cleary and Campbell, 1993; Campbell et al., 1995; Straub, 1996, 1997). Following the pioneering work by Bagnold (1954), the mechanics of granular flows has become an important area of research. However, despite significant advances, the understanding of granular flows is still too rudimentary to allow a rigorous application to geological flows. One major limitation of current theories is that they are not yet able to model flows with a wide range of particle sizes, like those occurring in nature. Even for more simple cases, with only one particle size, there are still discrepancies between some theoretical and experimental results. For example, numerical simulations of rapid granular flow that use periodic boundaries show an expanded shearing basal layer below a non-expanded, non-shearing plug (Cleary and Campbell, 1993; Straub, 1996, 1997), a flow structure similar to that hypothesised for landslides by some authors (Davies, 1982; Campbell, 1989). In contrast, laboratory experiments (Drake, 1990) and numerical simulations of a finite granular mass released on an incline (Campbell et al., 1995) do not show such an expanded shearing basal layer and have an upward-decreasing density.

The granular flow theory distinguishes two regimes, frictional and collisional. In the frictional, quasistatic regime, grains move slowly and dissipate energy through long-lasting, frictional contacts. The dissipative stress is the product of the coefficient of friction and the normal stress due to the overburden. In the collisional, rapid flow regime, grains are more agitated and dissipate energy through short-lived collisional contacts. The dissipative shear stress (τ_s) is proportional to the square of the vertical velocity gradient (dU/dy) and to a positive function of the particle concentration (f)

$$\tau_s = f\sigma D^2 \sin\alpha \left(\frac{dU}{dy}\right)^2, \tag{3}$$

where α is the critical dynamic angle of internal friction, σ is the density of particles and D their diameter (Bagnold, 1954; Savage and Hutter, 1989; Campbell, 1990). From Eq. (3), one would anticipate that, in this regime, the dissipative stress will increase with flow velocity. In contrast, experiments give the surprising result that the dissipative stress does not vary, or only little, with velocity (Hungr and Morgenstern, 1984a,b; Hanes and Inman, 1985; Savage and Hutter, 1989). This can be explained by the fact that particle collisions also generate a dispersive normal stress or dispersive pressure (P_d), which Bagnold (1954) showed to be proportional to the shear stress

$$P_d = \frac{\tau_s}{\tan\alpha}. \tag{4}$$

In a fully developed collisional flow, dispersive normal stress must be able to support the whole load of the overburden and so is equal to static pressure. When flow velocity increases, dispersive normal stress should increase too. But as soon as it becomes higher than the overburden load, the flow immediately expands, particle concentration decreases and consequently the dispersive normal stress decreases, until it is again just able to support the overburden. By this mechanism, in the collisional regime, the dispersive normal stress is always forced to be equal to the static pressure of the overburden, and so the shear stress, which is proportional to the dispersive normal stress, is also forced to be constant,

$$\tau_s = \mu N, \tag{5}$$

where N is the normal static pressure of the overburden and μ is the coefficient of friction, $\mu = \tan\alpha$. The Coulomb condition of constant coefficient of friction, valid in the frictional regime, therefore also holds in the rapid, collisional regime (Hungr and Morgenstern, 1984a,b; Hanes and Inman, 1985; Savage and Hutter, 1989; Straub, 1996, 1997), which means that a rapid, collisional granular flow cannot travel further than a frictional flow.

We may however wonder whether a landslide that would progressively lose mass due to deposition could not maintain a higher velocity and travel further than a landslide that would move and stop as a single block. Several authors have proposed models in which runout was modified owing to progressive mass change during transport (Cannon and Savage, 1988;

Van Gassen and Cruden, 1989; Voight and Sousa, 1994). Using a model based on the principle of conservation of momentum, Van Gassen and Cruden (1989) suggested that even the distance travelled by the centre of mass would increase for a landslide that would lose mass during transport. An analysis by Cannon and Savage (1988) based on the same principle was however criticised because it ignores the work necessary for the mass change (Hungr, 1990b; Erlichson, 1991). When a flow entrains an immobile mass and accelerates it up to its own velocity, momentum is conserved but the total kinetic energy of the system decreases because the entrainment and acceleration process is equivalent to an inelastic collision in which all the collisional energy is lost. In contrast, when a flow loses mass, using the conservation of momentum equation would imply an increase in the total kinetic energy of the system. This is clearly illustrated by the fact that, in the model of Van Gassen and Cruden (1989), the centre of mass is able to travel further than predicted by energy conservation arguments, which implies that there is more frictional work done by the landslide than potential energy lost. Conservation of momentum is correctly used to describe the motion of a rocket because the rocket engine does provide energy (Hungr, 1990b; Erlichson, 1991). In a landslide, however, there is no source of energy other than that derived from the loss of potential energy, so the conservation of momentum equation cannot be used. It follows that, even if mass is progressively lost, the centre of mass cannot travel further than in a constant-mass model.

Now, this does not mean that the *runout* (L_{max}) of frictional and collisional flows cannot be increased owing to progressive mass loss. This is illustrated by the following simple example. Consider two blocks of same mass sliding along a topography such as that represented in Fig. 4. If the blocks stick together and move as a single block, they travel until the centre of mass reaches a distance L for which H/L is equal to the coefficient of friction (Fig. 4a). If the blocks move separately, the centre of mass of the first block reaches the same distance L (Fig. 4b). The second block would like to do the same, but before it arrives at distance L, it collides with the first block (Fig. 4c). If collision is elastic, the second block stops (it "deposits") and transmits all its kinetic energy to the first block which can thus travel an excess distance (Fig. 4d). Comparison between Fig. 4a and d shows that runout (L_{max}) for the changing-mass slide is longer than for the constant-mass slide, although the distance travelled by the centre of mass (L) is the same. For a landslide containing a great number of particles, this mechanism of spreading by deposition would produce a continuous deposit. Note that in the block-sliding example described above, we assume that collision is elastic because energy is already dissipated through basal friction and an inelastic collision would cause an extra loss of energy. In a fully developed collisional granular flow, particle collisions are inelastic but this does not imply extra loss of energy as, in this regime, frictional stress is negligible and inelastic collisions are the only way by which energy is dissipated.

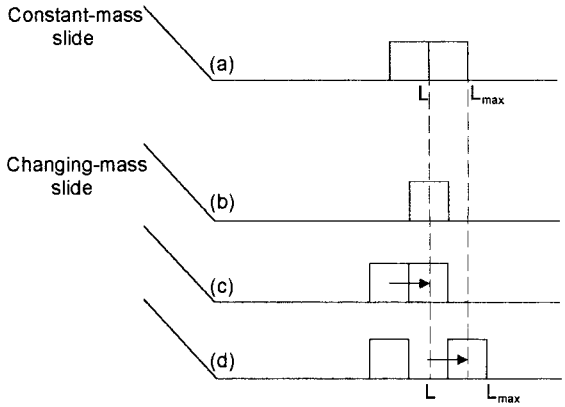

Fig. 4. Schematic comparison between a constant-mass slide (a) and a changing-mass slide (b–d). (a) The two blocks stick together and slide as a single block. (b) Block 1 slides first and reaches L. (c) Block 2 collides with block 1, stops and transmits its kinetic energy. (d) Block 1 slides an excess distance. L = distance travelled by the centre of mass; L_{max} = maximum distance travelled.

The excess runout due to mass deposition depends on the rate of mass change. Cannon and Savage (1988) and Van Gassen and Cruden (1989) investigated the effect of arbitrarily imposed mass-change rates on runout. Here, a model is proposed in which the mass-change rate is a consequence of the deceleration of a rapid granular flow and not an independent variable. We consider a granular flow initially in the collisional regime which decelerates on a gentle slope. As velocity decreases, dispersive normal stress decreases. As soon as it becomes less than the load of the overburden, the base of the flow immediately

compacts and particle concentration increases, until the normal stress is again equal to the load of the overburden. However, particle concentration cannot increase indefinitely, and when it approaches a certain threshold value, frictional stress becomes dominant over dispersive stress. Only above a certain level can the flow still move in the collisional regime, while the basal portion is now in the frictional regime. As velocity continues decreasing, the boundary between the frictional base and the collisional upper portion of the flow moves upward. This behaviour is shown in numerical simulations of decelerating rapid granular flows (Straub, 1997). As one would expect, the frictional base is much slower than the collisional top. Straub (1997) indicates that the part in the frictional regime does not contribute significantly to the flow motion and that, in practice, the passage from the rapid, collisional regime to the quasistatic, frictional regime may be viewed as deposition. A similar process is also shown in the experiments by Hanes and Inman (1985), in which a granular material is sheared in an annular cell. Only the upper portion of the granular material moves in the rapid collisional regime, while the lower portion is frictionally locked to the bottom of the annular cell. When the imposed shear stress is progressively lowered, the thickness of the granular material moving in the collisional regime decreases, which means that the interface between the rapid, collisional and quasistatic, frictional regions progressively shifts upward (Hanes and Inman, 1985). The deposit at the base of a slowing granular flow may therefore form by upward, progressive accretion.

We can now test whether the mass lost in this manner can account for a significant increase in runout. As deduced from Eqs. (3) and (4), the dispersive normal stress is given by

$$P_{\mathrm{d}} = f\sigma D^2 \cos\alpha \left(\frac{\mathrm{d}U}{\mathrm{d}y}\right)^2, \tag{6}$$

while the normal static stress due to the overburden is

$$N = \rho_{\mathrm{b}} g h \cos\beta, \tag{7}$$

where ρ_{b} is the bulk density of the landslide, h is its depth and β is the slope. Consider a landslide of mass m in the collisional regime debouching in a valley of negligible slope ($\beta \sim 0$), with a mean velocity U. As the shear stress is described by Eq. (5), the variation of kinetic energy with distance will be described by

$$\frac{\mathrm{d}E}{\mathrm{d}x} = \frac{U^2}{2}\frac{\mathrm{d}m}{\mathrm{d}x} + mU\frac{\mathrm{d}U}{\mathrm{d}x} = -\mu g m. \tag{8}$$

Note that this approach is different from that which considers conservation of momentum. Here, we consider that energy, not momentum, is conserved, for the reasons outlined above. As the slope is less than the angle of friction ($\tan\beta < \mu$), the landslide decelerates. The decrease in velocity can first be compensated by an increase in granular concentration at the base of the flow but, beyond a certain concentration (f_{c}), particle interactions become dominantly frictional. The dispersive normal stress can no longer support the load of the whole landslide and only the upper part can proceed in the rapid granular flow regime while the base slows down and deposits. By equating the static normal stress (Eq. (7)) with the dispersive normal stress (Eq. (6)), the thickness of the upper part of the landslide which still moves in the rapid flow regime is found to be

$$h = \frac{f_{\mathrm{c}}\sigma D^2 \cos\alpha}{\rho_{\mathrm{b}} g}\left(\frac{\mathrm{d}U}{\mathrm{d}y}\right)^2. \tag{9}$$

Eq. (9) can be simplified by assuming that $\mathrm{d}U/\mathrm{d}y = U/h_{\mathrm{s}}$, where h_{s} is the typical thickness over which shearing occurs. It is not very clear whether h_{s} should scale with the grain diameter (e.g., Cleary and Campbell, 1993; Straub, 1996) or with the flow thickness (e.g., Drake, 1990; Campbell et al., 1995; Mills et al., 1999). We first consider the case in which h_{s} is equal to a few times the typical grain diameter and so is independent of h, then the case in which h_{s} is proportional to h. In the first case, we have that

$$h = \frac{f_{\mathrm{c}}\sigma D^2 \cos\alpha U^2}{\rho_{\mathrm{b}} g h_{\mathrm{s}}^2} = B_1 U^2, \tag{10}$$

where

$$B_1 \equiv \frac{f_{\mathrm{c}}\sigma D^2 \cos\alpha}{\rho_{\mathrm{b}} g h_{\mathrm{s}}^2}. \tag{11}$$

As shown by Eq. (8), before the landslide starts depositing, the loss of kinetic energy due to granular stress is entirely accommodated by a decrease in the

mean velocity. When deposition starts, the loss of kinetic energy is accommodated by both a decrease in the mean velocity and a loss of mass of the moving landslide. The mass of the moving landslide can be expressed by $m = \rho_b A h$. Assuming that the area (A) of the moving landslide does not vary with time, we can transform the energy equation, Eq. (8), into

$$\frac{U^2}{2h}\frac{\mathrm{d}h}{\mathrm{d}x} + U\frac{\mathrm{d}U}{\mathrm{d}x} = -\mu g \tag{12}$$

and upon substituting h by $B_1 U^2$ (Eq. (10)), we see that

$$\frac{\mathrm{d}U}{\mathrm{d}x} = -\frac{\mu g}{2U}. \tag{13}$$

This shows that, due to deposition, the deceleration of the moving landslide is two times less than in a non-depositing case. The runout distance is obtained by integrating Eq. (13) up to the distance $L_{\max}$ at which U becomes zero, which yields

$$L_{\max} - x_0 = \frac{U_0^2}{\mu g}, \tag{14}$$

where x_0 is the distance where deposition starts, at which $U = U_0$. Eq. (14) shows that using a friction coefficient of 0.5 and a velocity of 100 m s^{-1} at the beginning of deposition would allow spreading of the landslide over only 2 km. Unrealistically high velocities or low friction coefficients should be assumed if the much larger distances over which natural landslides spread and deposit are to be explained by this model.

We can also calculate the distance travelled by the centre of mass (L). By substituting Eq. (10) into Eq. (12), we get the following expression for the loss of mass from the moving landslide by unit distance

$$\frac{\mathrm{d}h}{\mathrm{d}x} = -B_1 \mu g. \tag{15}$$

As the thickness of the deposit left at a given distance must be proportional to $-\mathrm{d}h/\mathrm{d}x$, Eq. (15) predicts that thickness will be constant over the whole length of the deposit. Therefore, the centre of mass will be at a distance

$$L = x_0 + \frac{(L_{\max} - x_0)}{2}. \tag{16}$$

By substituting Eq. (14) into Eq. (16) and by giving its value to the initial velocity U_0,

$$U_0 = (2g(H - \mu x_0))^{\frac{1}{2}}, \tag{17}$$

one finds that L is simply equal to H/μ, where H is the drop height of the centre of mass. As expected, the distance travelled by the centre of mass has not been increased by the mass change because no energy other than that derived from the loss of potential energy has been supplied to the landslide.

If we consider now the case where the typical thickness of shearing, h_s, is equal to the depth of the moving landslide, h, Eq. (10) becomes

$$h = B_2 U^{\frac{2}{3}}, \tag{18}$$

with B_2 defined as

$$B_2 \equiv \left(\frac{f_c \sigma D^2 \cos\alpha}{\rho_b g}\right)^{\frac{1}{3}}. \tag{19}$$

Substituting into Eq. (12) gives

$$\frac{\mathrm{d}U}{\mathrm{d}x} = -\frac{3}{4}\frac{\mu g}{U}. \tag{20}$$

Deceleration is stronger than for the first case (Eq. (13)) and so $L_{\max}$ is shorter. L remains equal to H/μ.

It is important to stress that the rate of mass loss and the runout increase calculated here are based on several simplifications and, in particular, on the assumptions that the granular flow is initially in the collisional regime and that the growing, friction-dominated basal portion has negligible velocity. Unfortunately, it is difficult to evaluate whether natural landslides can indeed be in the collisional regime, because the way interparticle collisions dissipate energy in a poorly sorted debris is still poorly understood. Notwithstanding this, the most important conclusion of this analysis of a changing-mass granular flow is that, as long as the Coulomb condition of constant coefficient of friction holds, progressive deposition does not allow the centre of mass to travel further than the distance expected for a sliding block, neither in the frictional nor in the collisional regime. This conclusion is a direct consequence of using the principle of conservation of energy; it does not depend on the specific simplifications and assumptions made here and is not modified if we consider a slope $\beta > 0$. Therefore, in order to explain the long runout of

landslides by granular spreading, we have to assume either that the Coulomb condition of a constant coefficient of friction does not hold, or that the effective coefficient of friction is smaller than the normal value of μ for rocks.

The possibility that the Coulomb condition of constant coefficient of friction may break down in large granular landslides has been suggested by Campbell et al. (1995). Their numerical simulations of granular, fluid-absent landslides show apparent coefficients of friction as low as those of natural landslide deposits, and also reproduce the negative correlation observed in nature between volume and apparent coefficient of friction. The numerical landslides of Campbell et al. (1995) travel in a regime intermediate between frictional and collisional and the authors speculate that this might be the reason for the breakdown of the Coulomb condition, although they recognise that there is currently no theoretical explanation nor experimental evidence for this. The simulations are presented as non-dimensional, as the volume, drop height, runout and velocity are non-dimensionalised by the particle diameter. It follows that the apparent coefficient of friction in these simulations actually depends on the *number* of particles, not on the volume of the landslide. For example, Fig. 12 of Campbell et al. (1995) shows that the decrease in apparent coefficient of friction with increasing volume observed in natural landslides is correctly reproduced in the simulations only if the particle diameter is 1 m (Fig. 5). It can be seen that, if the diameter is taken to be 0.1 or 10 m, the numerical results plot well outside of the field of natural data. If the simulations are truly non-dimensional, the same negative correlation between volume and apparent coefficient of friction should occur at smaller volumes for smaller particles. As shown in Fig. 5, apparent coefficients of friction as low as 0.1 should occur for volumes of 1 m^3 and particle diameters of 1 mm, or volumes of 1 dm^3 and particle diameters of 0.1 mm. It is interesting to note that, in laboratory experiments that use volumes between 0.1 dm^3 and 1 m^3 and grainsizes of 0.2 and 2 mm, apparent coefficients of friction measured from the runout distance L_{max} can be much lower than the actual coefficient of friction of the material (Davies and McSaveney, 1999). However, the most surprising result of the numerical simulations of Campbell et al. is that the apparent coefficient of friction measured from *the centre of mass* is also negatively correlated with volume. In

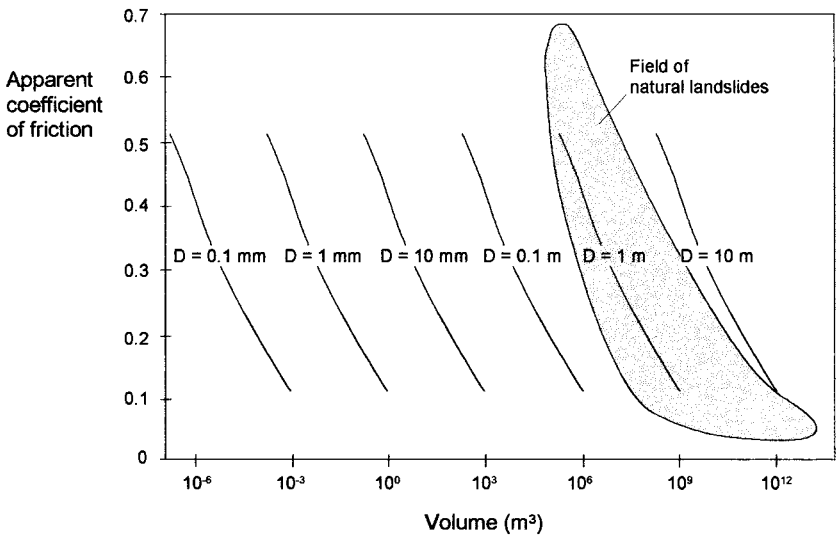

Fig. 5. Correlation between apparent coefficient of friction and landslide volume predicted by the numerical simulations of Campbell et al. (1995) for different particle diameters (*D*). For a given volume, simulations predict lower apparent coefficients of friction for higher numbers of particles, hence for smaller particle diameters.

contrast, Davies and McSaveney state that the translation of the centre of mass is similar for large- and small-scale avalanches, although they do not provide data in support of this statement.

It is difficult to evaluate the effect of the boundary roughness and particle circularity in the simulations of Campbell et al. (1995). While the numerical simulations by Cleary and Campbell (1993) had emphasised the strong influence of boundary roughness on runout, Campbell et al. do not indicate the boundary condition used. On perfectly smooth boundaries, simulations by Cleary and Campbell show that particle circularity causes a runout of small landslides much larger than expected, due to particle rolling, in contrast with what occurs in natural small landslides. One may therefore wonder whether particle rolling might not be partly responsible for the mobility of the large-landslide simulations of Campbell et al., and to which extent the results are applicable to natural landslides. A better understanding of the transitional regime and of the effect of a wide grainsize distribution in granular flows is required in order to evaluate whether the mobility of natural landslides can be explained by fluid-absent, granular models. At present, there is no firm evidence for this.

4. Role of fluids

4.1. Reduction of the solid coefficient of friction

The fact that landslides can travel larger distances than expected from simple frictional arguments has led many authors to hypothesise that fluids play a significant role in reducing solid friction (e.g., Kent, 1966; Shreve 1968a,b; Goguel 1978; Johnson, 1978; Voight et al., 1983; Voight and Sousa, 1994). Addition of an interstitial fluid can reduce the effective coefficient of solid friction of a granular material by partly supporting particles, thus reducing the normal granular stress (Bagnold, 1954). The upward force exerted upon a particle immersed in a fluid is equal to the product of the fluid pressure gradient and the particle volume. In the simple case where the fluid pressure gradient is hydrostatic, the normal granular stress is

$$N = g(\sigma - \rho_f)Ch, \tag{21}$$

where ρ_f is the density of the interstitial fluid, C is the particle concentration and the slope is again assumed negligible ($\beta \sim 0$) to be consistent with the equations derived above. As granular shear stress is related to normal stress by $\tau_s = \mu N$, it can be expressed by

$$\tau_s = \mu g(\sigma - \rho_f)Ch. \tag{22}$$

The decrease in kinetic energy with distance due to granular shear stress is

$$\frac{dE}{dx} = -\mu \frac{(\sigma - \rho_f)C}{\rho_b} gm, \tag{23}$$

where ρ_b is the bulk density of the landslide defined as

$$\rho_b = \rho_f(1 - C) + \sigma C. \tag{24}$$

Compared with Eq. (8), the effective coefficient of friction in Eq. (23) has been decreased by a factor $(\sigma - \rho_f)\, C/\rho_b$. It can become very low if the density of the interstitial fluid (typically water plus fine particles) is important relative to that of large particles.

The pressure gradient in the fluid can also be in excess of hydrostatic. If it becomes equal to the lithostatic pressure gradient, the whole load of the solid material is supported by the fluid and the solid friction effectively reduces to zero. The flow is said to be liquefied, or fluidised. Iverson (1997) showed that transient pore fluid pressures exceeding hydrostatic pressures occur in experimental debris flows and act to reduce energy dissipation and enhance flow mobility.

Eq. (23) does not take into account the viscous stress due to the interstitial fluid. When solid friction becomes very low, viscous dissipation may become dominant, and the landslide behaves like a fluid, with a dissipative stress proportional to the velocity gradient. Energy dissipation may therefore become higher on steep slopes and lower on gentle slopes. We shall see in a later section that this is qualitatively consistent with the way landslides respond to topography.

4.2. Fluids in extraterrestrial landslides

The idea that fluids are important for landslide mobility was dealt a severe blow by the discovery of landslide deposits that had travelled unexpectedly

large distances on the Moon (Howard, 1973) and on Mars (Lucchitta, 1978, 1979, 1987; McEwen, 1989). The evidence that extraterrestrial landslides travelled great distances in fluid-absent conditions is however equivocal. On Mars, the atmosphere pressure is about 100 times less than on the Earth and its possible role in fluidising landslides is probably negligible. More significant is the presence of ground ice at shallow depths. Lucchitta (1978, 1979, 1987) believed that Martian landslides were emplaced as wet debris avalanches. McEwen (1989) rejected this hypothesis and proposed that they were dry. The term *dry* was clearly used to refer to *unsaturated* debris avalanches, as opposite to *wet* debris flows assumed to be saturated in water. Indeed, one argument of McEwen for the dry nature of Martian landslides was the similarity of their deposits with those of landslides on the Earth. There would be a circularity in the reasoning if we were now using the dry nature of Martian landslides to conclude that water is unimportant for the mobility of terrestrial landslides, when the dry nature of Martian landslides has been inferred from their resemblance with terrestrial ones. The other argument of McEwen (1989) against a wet emplacement of Martian landslides was that, in the region where they occurred, the ground was probably depleted of ice to depths of 100 m or more. However, as all these landslides have estimated volumes between 10^8 and 10^{13} m^3, most of them involved failure to depths probably well below 100 m, sometimes up to several kilometres. They are therefore likely to have contained a substantial volume of ground ice. At least part of the ice should rapidly melt during landslide emplacement, and liquid water would remain stable within the landslide due to the pressure of the overburden. The smallest landslide presented by McEwen (1989) has a volume of 10^8 m^3 and an H/L ratio close to 0.6, much higher than that typical of terrestrial landslides of similar volume. This is about the value expected from purely frictional arguments and it may reflect the relative dryness of this small landslide, probably constituted of superficial, ice-depleted rocks. The fact that no landslide smaller than 10^8 m^3 has been described on Mars, if it is not an artefact due to the low resolution of images or to a lower interest in small structures, might reflect the difficulty for triggering landslides in superficial, dry material.

A long-runout landslide deposit was described on the Moon, where atmosphere and water are absent (Howard, 1973). The deposit around the Tsiolkovsky impact crater has also been interpreted by some authors as the result of a large lunar landslide (Guest, 1971; Hsü, 1975). Both events are however suspected to have been triggered by impacts, which would have provided additional energy, so they may have been emplaced partly as ejecta (Howard, 1973; Lucchitta, 1977). If we put these questionable cases aside, the striking feature on the Moon is the *lack* of long-runout landslide deposits. The steep inner walls of impact craters are affected by large slumps and small granular avalanches, which do not extent further than expected from the repose angle of the material. Evidence from the Moon might therefore suggest that fluids are indeed essential for the generation of long-runout landslides.

4.3. Lubrication by a basal air layer

Shreve (1968a) proposed that the Blackhawk landslide overrode, trapped and compressed a cushion of air over which it slid with little friction. By estimating the volume of compressed air that had been trapped, Shreve (1968b) deduced that the leakage rate had to be less than 1 mm s^{-1} in order to maintain the lubricating air layer during the time of landslide emplacement. By using a sophisticated form of the Darcy equation and assuming an air-pressure gradient equal to the lithostatic gradient, he proposed that a permeability of 10^{-12} m^2 was required, a reasonable value for the very poorly sorted debris typical of landslides (Iverson, 1997).

The major problem with this analysis is that it assumes that the debris has a fixed permeability which controls the leakage rate. Experiments on fluidisation (e.g., Wilson, 1984) show that the permeability of a sediment can dramatically increase when it is fluidised. In these experiments, a controlled flux of air is passed upward through a bed of sediment resting on a permeable support. The air pressure at the base of the bed is measured with a manometer. As long as the air pressure gradient is less than lithostatic, it varies linearly with the imposed flux (or velocity) as expected from the Darcy equation (Eq. (1)). Once the air pressure gradient becomes lithostatic, it does not increase any longer with an increase of the imposed flux (Fig. 6). This is easy to

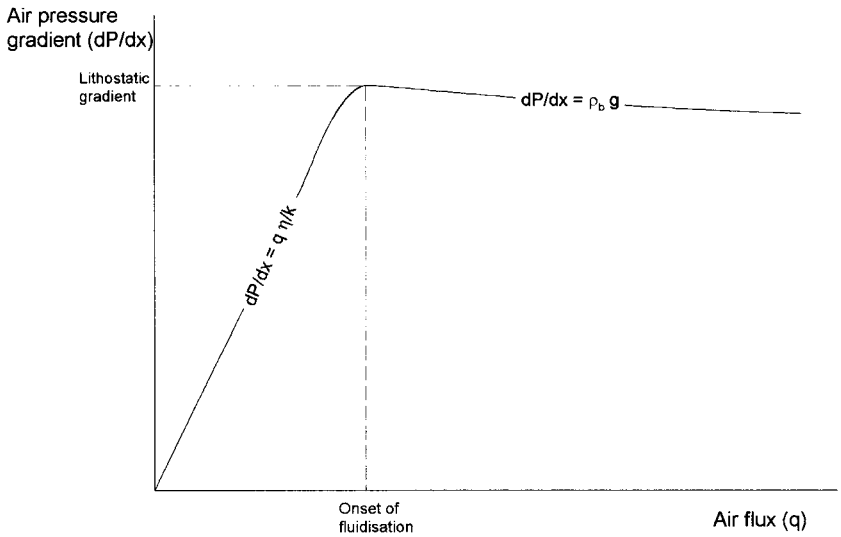

Fig. 6. The relation between air pressure gradient and air flux in fluidisation experiments. As long as the sediment bed is not fluidised, air pressure gradient increases linearly with air flux, at a rate inversely proportional to its permeability (k). When the bed is fluidised, the air flux can be increased without increasing the pressure gradient, which remains equal to the lithostatic pressure gradient ($\rho_b g$) of the bed. This implies that the effective permeability increases. The slight decrease in air pressure gradient with air flux is caused by the slight decrease in the sediment bulk density due to bed expansion.

understand as, once the air is able to support the weight of the bed, a slight expansion of the bed dramatically increases its permeability and allows a much greater flux of air to be passed. In other words, for air pressure gradients lower than lithostatic, permeability controls air flux, while, for air pressure gradients equal to lithostatic, air flux controls permeability. In practice, for gas fluidisation, effective permeability is increased with a very slight expansion of the bed, as the extra fluid is passed through the bed in the form of bubbles (Wilson, 1984).

In the air-layer lubrication model, a fixed amount of air is compressed below the landslide at lithostatic pressure. In this situation, air flux will control permeability and not the contrary, so the analysis of Shreve (1968b) which treats the landslide as a coherent, porous block of fixed permeability is flawed. What then will control the velocity of air leakage through the debris and so the time during which the air cushion can suppress basal friction? If the flux of air leaking through the debris cannot be restricted by permeability, the debris should be able to fall essentially unhindered. In fact, the situation in which a dense granular debris is entirely supported by a light gas is not stable, even if theoretically the gas pressure gradient is able to support the debris. The granular debris would fall by batches and the gas would rise as large bubbles, hence much more rapidly than if controlled by the permeability of the debris. Even in a static column, a poorly sorted granular debris can fall virtually unhindered by air. It is therefore extremely difficult to conceive how particles within an agitated landslide could remain locked together and avoid falling through the basal air layer, even pressurised.

4.4. Fluidisation by air

If the air-layer lubrication hypothesis is seriously questioned, this does not rule out that landslides might be partly *fluidised* by air. Complete fluidisation of a sediment bed occurs when the pore fluid pressure gradient in the bed is lithostatic, so that it can support the load of the overburden and, in a flow, reduce granular friction. As the bed is pervious and denser than the interstitial fluid, lithostatic pore pressure gradients provoke the upward escape of the fluid. Thus, maintaining the lithostatic pressure gradient requires a continuous supply of fluid at the bottom

of the bed. As this is unlikely in landslides, what must be evaluated is whether high pore pressures can be maintained for a time comparable to that of landslide emplacement.

If the air pressure gradient is just less than lithostatic, permeability and consequently the rate of air escape are kept low (see Fig. 6). The presence of an air pressure gradient lower than lithostatic would still act to lower the normal granular stress, hence the friction. As shown by the equation of Darcy (Eq. (1)), a debris with permeability 10^{-11} m^2 could be fluidised with a flux of air of about 1 cm s^{-1}. In the absence of a continuous supply of air at the bottom, fluidisation would require a net downward movement of the granular material (Iverson, 1997), i.e., progressive aggradation of the deposit by hindered settling (Druitt, 1995). If we can assume that the debris compacts by 10% when it deposits, a 10-cm s^{-1} aggradation rate is required to release 1 cm of air per second at the base of the moving debris. A 10-cm s^{-1} aggradation rate would leave a 10-m-thick deposit in 100 s, which is in good match with the thickness and travel time of the Blackhawk landslide (Shreve, 1968a,b). Thicker landslides would be able to travel for a longer time, hence to reach longer runout distances.

However, hindered settling requires that the debris pores be filled with air at or close to lithostatic pressure. It is unlikely that initial air pore pressure within the failing mass is more than atmospheric, so, in order to fill all the pores with air at lithostatic pressure, a large volume of air should be incorporated rapidly during the falling stage. The volume of atmospheric air that should be incorporated (V_a) is the product of the volume of the landslide (V), its porosity ($1-C$) and its average lithostatic pressure ($\rho_b gh/2$) divided by the atmospheric pressure (P_a),

$$V_a = V(1-C)\frac{\rho_b gh}{2P_a}. \tag{25}$$

Thick landslides would have to incorporate and pressurise a volume of atmospheric air several times to several tens of times their own volume, a condition difficult to attain. Therefore, although it cannot be ruled out that fluidisation by air may play some role in reducing friction in some landslides, it is probably not the principal mechanism that allows their long runout, particularly for large ones. On Mars, where atmospheric pressure is 100 times less than on the Earth and gravity acceleration only 2.5 less, fluidisation by air would be even more difficult to achieve.

Continuous injection of air at the head base is also unlikely. Mohrig et al. (1998) showed that this could occur for water in submarine debris flows, when the value of the dynamic pressure at the head ($\rho_f U^2/2$) approaches that of static pressure ($[\rho_b - \rho_f]gh$). With air, this condition seems impossible to achieve, even for thin and fast landslides.

Hsü (1975) proposed that, on the airless Moon, dust might constitute the interstitial fluidising phase. It is however difficult to conceive how fine particles may form a suspension in the vacuum. The clouds of dust visible during the landing of the Apollo crafts to which Hsü alludes were most probably caused by the gas jet from the crafts themselves. In the absence of gas, all particles should follow ballistic trajectories and fall at the same velocities whatever their size. The buoyancy that particles feel in a fluid or suspension fluid is due to the static pressure gradient existing in the fluid. Even if a theoretical bulk density can be calculated for a "suspension" in vacuum, there can be no pressure gradient, so no buoyancy effect. Therefore, in the absence of externally derived fluids, such as those that would be produced during a meteorite impact, fluidisation is not possible on the Moon.

4.5. Fluidisation by water

The main difference between landslides and debris flows relevant to their rheology is probably that debris flows are saturated with water while landslides are not. Debris flows are typically much more mobile than landslides of the same volume and this difference is largely attributed to the abundance of water in the formers (Iverson, 1997). Water is thought to lower granular friction through the occurrence of high pore pressure gradients. By opposition to the obviously "wet" debris flows, landslides have sometimes been described as "dry". It is nevertheless well known that there are not two clearly separated types of flow, some totally dry and the others fully saturated with water. Instead, there must be a continuum of water saturation between hypothetical dry landslides and saturated debris flows.

There is good evidence that landslides can transform into debris flows (e.g., Plafker and Ericksen, 1978; Voight et al., 1983; Iverson et al., 1997; Vallance and Scott, 1997; Mothes et al., 1998; Takarada et al., 1999), which demonstrates that there is a continuum of water saturation and that deposits which still have characteristics typical of landslides can form from mass flows containing some water. A substantial amount of water is likely to be already present in the failing mass of most landslides. This is, for example, the case of most landslides in New Zealand, which nevertheless produce typical hummocky deposits containing shattered megablocks with jigsaw fractures (Palmer et al., 1991). The presence of a water table is often a necessary condition to trigger mass collapse by an increase in pore water pressure under undrained conditions (e.g., Iverson, 1997). Water can further be added to the base of landslides by incorporation of saturated valley sediments or directly by mixing with water from a river. Clastic dykes of fine material injected from the base were found in the deposits of the Blackhawk landslide (Johnson, 1978) and the Arequipa volcanic landslide (Legros et al., 2000), suggesting the presence of a high-fluidity, muddy basal layer (Fig. 7). The matrix of the freshly deposited, 1984 Ontake-san landslide was also described as wet (Voight and Sousa, 1994). Submarine landslides must contain water and, nevertheless, they leave deposits with a morphology distinctive from that of saturated debris-flow deposits. As discussed above, ground ice is also likely to be present in most Martian landslides. Therefore, there is good evidence that most landslides contain some water. As we know that water enhances the mobility of debris flows, a logical hypothesis is that it can also enhance the mobility of landslides. Water would reduce granular friction through the development of high pore pressure, essentially like in saturated debris flows, except that in landslides, only a part of the flow, typically the base, would be saturated in water.

Compared to air, water presents several advantages for developing and maintaining high pore pressures: it is denser, incompressible and more viscous. The density of water ensures a minimum (hydrostatic) pore pressure gradient of 10^4 Pa m^{-1}, which can already account for a significant reduction of the granular shear stress, as shown by Eq. (22). The incompressibility of water allows it to be easily loaded by the debris and attain lithostatic pressure with a negligible volume contraction. Thus, large landslides need not incorporate huge volumes of water in order to be fluidised, as is necessary with air fluidisation. Water initially present in the failing mass is sufficient. For any given pressure gradient and permeability, the higher viscosity of water compared to that of air reduces its rate of escape by a factor of 100 (Eq. (1)). In addition, the process of aggregative fluidisation during which air is passed through the sediment bed in the form of bubbles, and which dramatically decreases the effective permeability of the bed, does not occur with water (Wilson 1984). Therefore, water seems to be a fluid much more appropriate than air for partial fluidisation of landslides. Recent experimental and theoretical work by Major and Iverson (1999), Major (2000), and Iverson

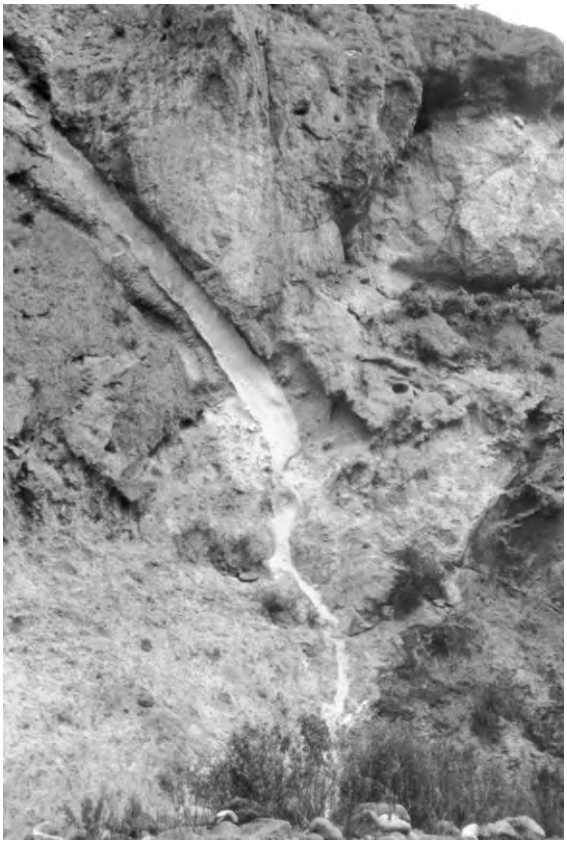

Fig. 7. Photograph of a 20-m-high clastic dyke of muddy sediment injected into the Arequipa volcanic landslide deposit.

and Denlinger (2001) has shown that high pore-water pressures, nearly sufficient to cause liquefaction, could be maintained during debris-flow emplacement.

As there is probably not a continuous supply of water at the bottom of landslides, maintaining high pore pressures requires a net downward movement of the debris, which implies some kind of progressive deposition at the base (Iverson, 1997). It is unlikely, however, that the deposit forms by progressive aggradation up to the top. The hummocky topography of landslide deposits rather suggests a deposition en masse due to the strength of the debris. A high strength is indeed expected in the upper, unsaturated part of landslides. Therefore, the unsaturated upper part would account for the very irregular surface of landslide deposits, contrasting with the smoother surface of saturated debris-flow deposits, while the saturated base would account for the long runout, unexpected for dry granular debris. All other things being equal, runout should be a positive function of the saturated volume, which can explain the higher mobility of larger landslides. This view is consistent with the fact that saturated debris flows, in which the fluid phase is believed to be responsible for the long runout, show an increase of runout with volume similar to that of landslides (Fig. 3b; Table 3).

5. Velocity of landslides

The degree to which topography controls emplacement of landslides primarily depends on their velocity and can serve to constrain rheological models. The relationship between velocity and topography can be described using the "energy line" concept (Sheridan, 1979). The energy line defines the maximum height that a landslide would be able to reach by converting all its kinetic energy into potential energy, as a function of the distance away from the origin. Note that, with this definition, the energy line does not represent the total mechanical energy of the landslide, but rather the mechanical energy by mass unit. This

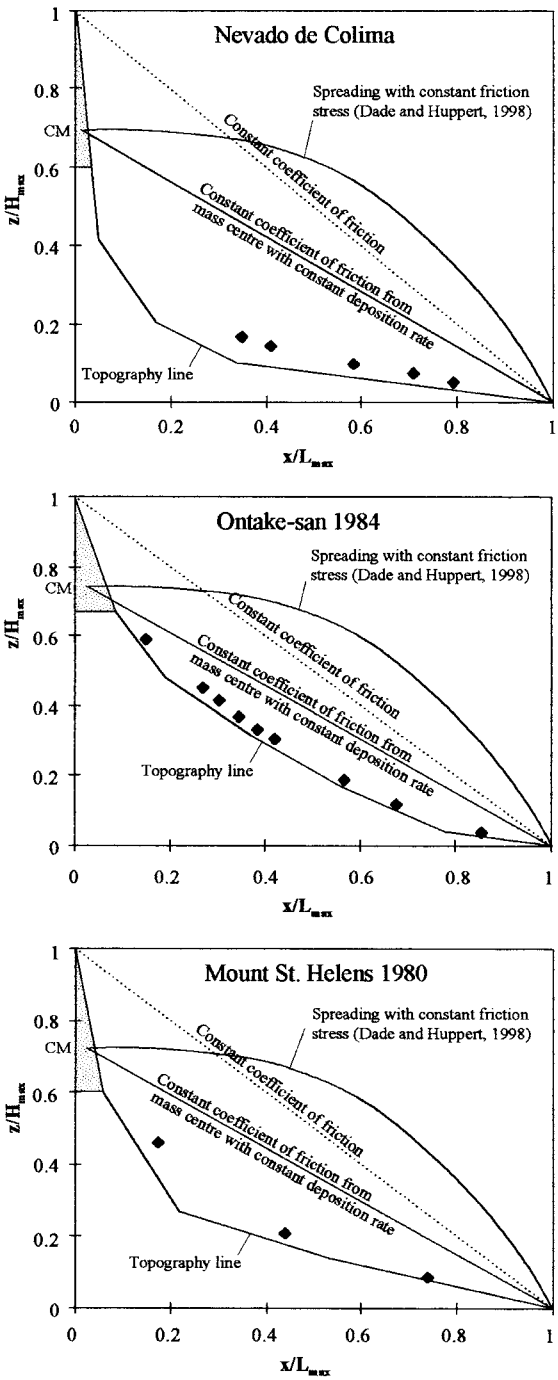

Fig. 8. Energy lines for models which assume a constant friction stress or a constant coefficient of friction, compared with data from natural landslides (solid diamonds). The velocities inferred for the three landslides are small (diamonds close to the topography line) and tend to decrease downstream. The models are seen to overestimates velocities. Vertical and horizontal coordinates, z and x, are normalised to H_{max} and L_{max}, respectively. Shaded area represents the failing mass and CM is the centre of mass.

definition is convenient because, as the mass of landslides may change during transport, the parameter that can be estimated is velocity, not mechanical energy. Although the energy line concept has been much used with constant coefficients of friction, thus producing straight energy lines, it can be used with other rheological models.

There are few landslides for which reliable velocity estimates are available. Fig. 8 shows the data for the Mount St. Helens (Voight et al., 1983), the Nevado de Colima (Stoopes and Sheridan, 1992) and the Ontake-san (Voight and Sousa, 1994) landslides, together with the energy lines predicted by various models. It appears that the actual landslide velocities are always much lower than predicted by models which assume a constant coefficient of friction. These include models in which energy is dissipated by solid friction at the base of a sliding block or by frictional or collisional particle interactions within a granular debris. According to these models, landslides should be much less controlled by topography than they are. This was also noted by McEwen and Malin (1989) and Voight and Sousa (1994) from their numerical simulations of, respectively the Mount St. Helens and the Ontake-san landslides. One reason for this is that energy lines have been drawn from the top of the failing mass, whereas they should start from its centre of mass. Fig. 8 also shows energy lines starting from the centre of the failing mass and corresponding to a constant coefficient of friction, with a constant loss of mass by unit distance. As shown by Eq. (8), when a landslide loses mass by deposition, it decelerates less rapidly and the slope of the energy line decreases. Although these energy lines are much lower than those starting from the top of the failing mass, they still predict velocities much greater than those estimated for the three landslides. Moreover, these energy lines are based on the assumption that the rate of mass loss does not vary with distance, while the deposits of the three landslides are actually wider and thicker near source. The energy lines corresponding to such mass distributions would be convex curves always above the straight lines presented, so they would predict still greater velocities. Therefore, models which assume a constant coefficient of friction tend to overestimate landslide velocity, even when mass loss by deposition is taken into account.

Dade and Huppert (1998) recently proposed a physical model for landslide transport which predicts a correlation between volume and area deposit in good agreement with existing data. The model assumes a constant dissipative stress. This is different from the traditional assumption of constant *coefficient* of friction. For a slide that has a constant coefficient of friction, the loss of energy by unit mass and unit distance travelled is constant (Eq. (8)), which gives the typical straight energy line. For a landslide with a constant dissipative stress (τ_s), the loss of energy by unit distance is

$$\frac{\mathrm{d}E}{\mathrm{d}x} = -\tau_s A. \tag{26}$$

If the area (A) is constant, we get a straight energy line but if the landslide is spreading, A increases with x and so does the force acting against the movement, $\mathrm{d}E/\mathrm{d}x$. Assuming that $A = \lambda x^2$ (Dade and Huppert, 1998), where 2λ is the angular extent of the assumed uniform sector through which the landslide spreads, and integrating Eq. (26) yields the form of the relation between mechanical energy and distance from the origin,

$$E = E_0\left(1 - \frac{x^3}{L_{\max}^3}\right). \tag{27}$$

Fig. 8 shows that this gives energy lines still higher than for the model of constant coefficient of friction. Thus, this model predicts velocities which are much too high compared with those of real landslides.

In the numerical simulations of Campbell et al. (1995), the velocity is seen to increase nearly linearly with time along the initial slope and then to decrease nearly linearly over the flat, except near the end of transport where deceleration lowers. The roughly constant acceleration and deceleration suggest a constant coefficient of friction, and the maximum velocity at the foot of the initial slope is about that expected for a straight energy line model.

The relatively low velocities of natural landslides suggest that they are submitted to velocity-dependent drag forces. High velocities acquired during the

initial falling stage would therefore be rapidly dissipated. Landslides would then go on with little help from their initial kinetic energy. In these conditions, their ability to spread on gentle slopes implies that the granular friction coefficient is very low and that landslides flow rather than slide. Velocity would primarily be controlled by the local slope and depth of the flow, as it appears to occur for debris flows (Pierson, 1985). The downstream decrease in velocity would thus be explained by the decrease of flow depth with distance, due to spreading and deposition, as well as by the common decrease in slope gradient away from source. The flow would progressively lose mass by deposition and travel until it runs out of material.

6. Self-similar shape of landslide deposits

Velocity data from landslides suggest that they rapidly lose the kinetic energy gained on the initial slope and that their spreading is mainly controlled by their volume and the local slope. This means that the part of a landslide which passes beyond a certain distance will spread somehow independently of the rest. In other words, the volume passing beyond a certain distance does not "know" that it is part of a larger landslide, and spreads as if it was an independent landslide. One would therefore expect that the correlation observed between volumes and areas of landslide deposits be also valid for portions of individual deposits. This means that, for a given landslide, the volume which has passed a certain distance should always be correlated with the area of the deposit beyond that distance. As noted by several authors (Hungr, 1990a; Vallance and Scott, 1997; Iverson et al., 1998; Dade and Huppert, 1998) and in Fig. 3e, the area covered by landslide and debris-flow deposits is about proportional to their volume at the power two thirds, $A \sim cV^{2/3}$. We may calculate the self-similar shape of the deposit for which A_x is always equal to $cV_x^{2/3}$, where A_x and V_x are the area and volume of the deposit beyond a distance x from the origin. On a real, irregular topography, such a calculation may be very

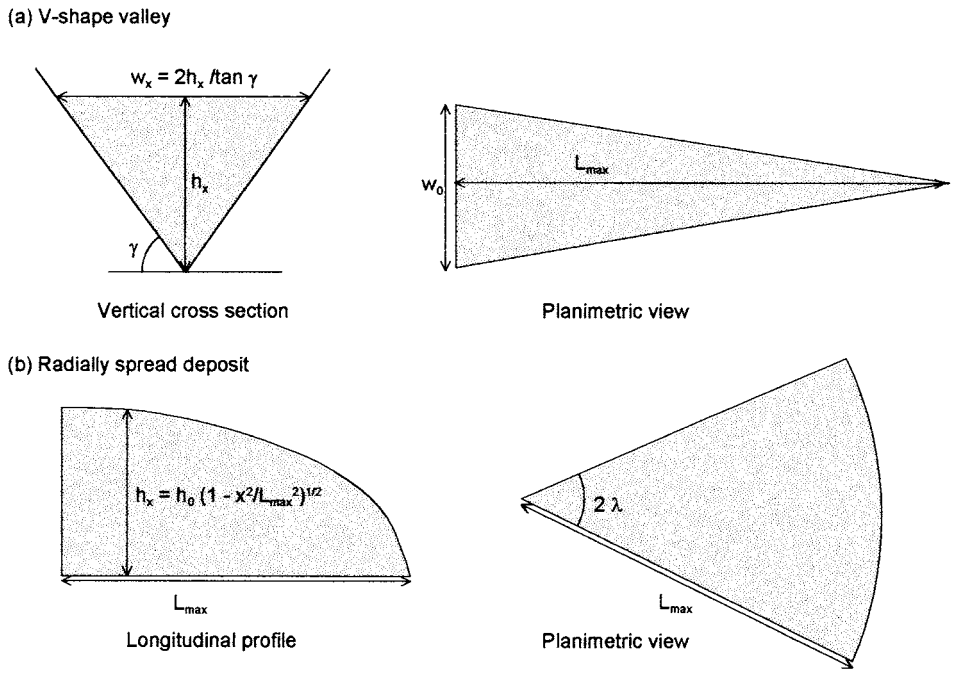

Fig. 9. Sketch of the self-similar shape of landslide deposits, and definition of the variables used in the text and the appendix: (a) in a V-shape valley; (b) radially spread deposit.

complex, but we can use idealised geometrical cases. One particularly relevant geometry is that of a *V*-shape valley channelling the landslide (Fig. 9a). Such a valley is characterised by the slope of its sides, γ. At a given distance x from the origin, the deposit has a thickness h_x at the centre of the valley and a width $w_x = 2h_x/\tan\gamma$. It can be demonstrated (Appendix A) that $A_x = cV_x^{2/3}$ for any x if the thickness of the deposit decreases linearly away from the origin, following the equation

$$h_x = h_0\left(1 - \frac{x}{L_{\max}}\right), \tag{28}$$

where $h_0 = 3V_0/A_0$.

Data of thickness versus distance from the origin are scarce for landslide deposits. The large volcanic landslide of Mount Shasta was emplaced in a wide, open valley, and has a volume and an area estimated to 45 km^3 and 675 km^2, respectively (Crandell, 1988). Crandell divided the deposit into seven areas labelled from A to G, situated at increasing distances from Shasta volcano, except for area F which is a narrow marginal band elongated in the valley direction. For each area, he provided an estimate of the volume. Based on these data, Fig. 10a shows the relation between the volume and the area found beyond a certain distance. It can be seen that the relation $A \sim 50V^{2/3}$ found for the whole deposit is also approximately valid all along the deposit. Assuming that the deposit has a geometry roughly of the type schematically represented in Fig. 9a, with $L_{\max} \sim 55$ km and $x_0 \sim 10$ km, the central thickness must vary according to Eq. (28) with $h_0 \sim 200$ m. This is in rough agreement with Crandell's maximum thickness estimates (Fig. 10b).

Voight et al. (1983) showed that the Mount St. Helens landslide was emplaced in three blocks. Block 3 was able to flow in the Toutle River valley for some 20 km. The deposit has a wedge shape for which both the central thickness and the width in the Toutle River valley are observed to decrease roughly linearly with distance from the origin. A roughly linear decrease of the thickness is also observed for the deposit of the Elm landslide in the Unterthal valley (Hsü, 1975). For a landslide spreading over an angular sector (Fig. 9b), the thickness is not expected to vary much with distance from the origin (Appendix B), which is in agreement with the thickness profile of the Sherman

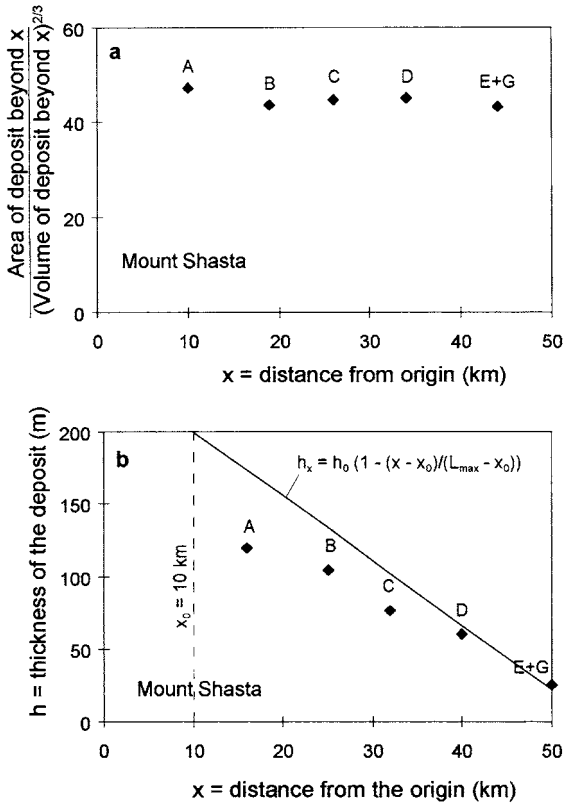

Fig. 10. (a) Ratio of area of deposit beyond a certain distance to volume of deposit beyond the same distance at the power two-thirds, for the Shasta volcanic landslide. The ratio is roughly constant. (b) Thickness profile predicted if the deposit has the shape represented in Fig. 9a (solid line), compared with the maximum thickness observed (solid diamonds). Capital letters refer to the divisions of Crandell (1988). Zone F is not used as it is a marginal, elongated band parallel to the valley direction.

landslide deposit (McSaveney, 1978). In detail, discrepancies between the idealised geometrical model and natural landslide deposits are expected, because of the irregular geometry of natural valleys, and the possible evolution of the rheology of landslides as they progress downstream (e.g., Voight and Sousa, 1994). More detailed data on the distribution of mass of landslide deposits as a function of the topography are needed. The trend observed in the examples presented above nevertheless reinforces the idea explored in a previous section that the area and the runout distance of a landslide deposit primarily depend on its volume, and that the fall height is probably of secondary importance.

7. Conclusions

The present examination and discussion of several issues relevant to landslide mobility allows the following conclusions to be proposed.

(1) The ratio of the height lost to the distance travelled by the centre of mass of landslides, H/L, is generally much lower than the coefficient of friction of normal rocks, μ. The reduction of the apparent coefficient of friction of landslides is real and is not an artefact due to the fact that the ratio of maximum fall height to maximum runout distance, H_{max}/L_{max} is commonly used instead of H/L. In many cases, H_{max}/L_{max} is probably not much smaller than H/L.

(2) Current understanding of granular avalanches suggests that they exhibit a constant coefficient of friction, close to the coefficient of friction of their particles, in both the frictional, quasistatic flow regime and the collisional, rapid flow regime. In these conditions, it has been shown here that, even if the avalanche can spread by progressive deposition, so as to increase L_{max}, the ratio H/L remains equal to μ. A fluid-absent, granular model is therefore unable to explain landslide mobility, unless granular friction is significantly reduced by high pore-fluid pressure or the assumption of a constant coefficient of friction breaks down. The latter possibility has been proposed by Campbell et al. (1995) to explain the results of numerical simulations that were in a regime transitional between frictional and collisional. This transitional regime is still poorly understood and to what extent the results of the simulations are applicable to real granular systems is unknown. Whether fluid-absent, granular avalanches can explain the long runout of landslides is still an unresolved question.

(3) The effective coefficient of friction can be significantly reduced by the presence of an interstitial fluid which partly supports the granular load, and thus lowers the granular stress. The fluid would also add a velocity-dependent, viscous stress. Models which use a constant coefficient of friction predict velocities that are much greater than those inferred for real landslides and cannot account for their great responsivity to topography. The low velocities of landslides suggest that they behave much like a fluid, with a velocity-dependent dissipative stress and a low effective coefficient of solid friction, in agreement with what is expected for partly fluidised debris.

(4) The ratio H/L may therefore be physically meaningless. The good correlations between runout distance and volume, and area and volume, suggest that landslide spreading is essentially controlled by their own volume, and not by H.

(5) Martian and lunar landslides are not evidence that landslides can travel large distances as fluid-absent, granular systems. Martian landslides are likely to contain substantial amounts of ground ice, part of which could melt owing to frictional heating during transport. Long-runout landslides are extremely rare on the Moon, and the two examples described in the literature are associated with meteorite impact and may in part have been transported as ballistic ejecta.

(6) Air is unlikely to fluidise landslides efficiently, nor to support them by forming a compressed layer at their base. Fluidisation or basal lubrication by air becomes increasingly difficult as landslide volume increases, so air cannot explain the greater mobility of larger landslides.

(7) Water is much more efficient than air as a fluidising medium, due to its higher density and viscosity, and its incompressibility. Hummocky surfaces and jigsaw fractures are observed in the deposits of landslides which probably contained large amounts of water. Landslides are unsaturated with water, but probably seldom dry. As it is generally admitted that water plays a fundamental role in the large mobility of saturated debris flows, it seems likely that it also plays a role in the dynamics of landslides. The increase in landslide runout with volume follows the same trend as that observed for saturated debris flows, as expected if they share the same physics.

(8) The low velocity of landslides and their inferred fluid-like behaviour suggest that their spreading beyond a certain distance is primarily controlled by the local slope and by the volume that passes that distance, and that there is no "memory" of the initial drop height or of the volume of the landslide which does not pass that distance. The relation between volume and area of the deposit beyond any distance should therefore be constant within a given deposit, which allows the shape of the deposit to be predicted for different topographies.

This last point emphasises the need for more detailed data on the areal distribution of the mass of landslide deposits. It also suggests that hazard zonation for landslide events should rely on their area–

volume relationship, as recently proposed for debris flows (Iverson et al., 1998), rather than on their apparent coefficient of friction, often used for this type of effort.

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Appendix A. Self-similar shape of a landslide deposit in a V-shape valley

We are looking for the shape of a deposit in a V-shape valley such that $A_x = cV_x^{2/3}$ for any x, where x is the distance from the origin, A_x and V_x are, respectively, the area and the volume of the deposit beyond distance x, and $c = A_0/V_0^{2/3}$ is a constant, where the subscript 0 refers to the origin of x. The deposit is defined by its thickness at the centreline of the valley, h_x, its width at the top, w_x, and its total length, $L_{\max}$. These parameters are schematically represented in Fig. 9a, together with γ, the angle of the valley sides with the horizontal. (Note that for simplicity this assumes that there is no distance x_0 between the source and the proximal end of the deposit. If there is a certain x_0, as in Fig. 1, one should use $x - x_0$ instead of x, and $L_{\max} - x_0$ instead of $L_{\max}$ in the following equations). From Fig. 9a, we see that

$$w_x = \frac{2h_x}{\tan\gamma}. \tag{A1.1}$$

The area of a vertical cross-section in the deposit is defined as

$$S_x = \frac{w_x h_x}{2} = \frac{h_x^2}{\tan\gamma}. \tag{A1.2}$$

Anticipating from dimensional arguments that h_x and w_x will both vary linearly with x, we propose the following expression for h_x,

$$h_x = h_0\left(1 - \frac{x}{L_{\max}}\right). \tag{A1.3}$$

By using the three equations above, we can now calculate A_x and V_x,

$$A_x = \int_x^{L_{\max}} w_x \mathrm{d}x = \frac{h_0(L_{\max} - x)^2}{L_{\max}\tan\gamma}, \tag{A1.4}$$

$$V_x = \int_x^{L_{\max}} S_x \mathrm{d}x = \frac{h_0^2(L_{\max} - x)^3}{3L_{\max}^2\tan\gamma}, \tag{A1.5}$$

from which we can check that

$$A_x = \frac{A_0}{V_0^{2/3}} V_x^{2/3}. \tag{A1.6}$$

Appendix B. Self-similar shape of a radially spread landslide deposit

Let us consider a deposit of radial shape over a sector of angle 2λ, and with other parameters defined as in Appendix A and Fig. 9b. We want to find the radial profile of the thickness for which the area beyond a certain distance x is always proportional to the volume beyond this distance at the power two third, as expressed in Eq. (A1.6). We can show that the equation

$$h_x = h_0\left(1 - \frac{x^2}{L_{\max}^2}\right)^{\frac{1}{2}} \tag{A2.1}$$

satisfies this condition. The area and the volume beyond x are, respectively, given by

$$A_x = \int_x^{L_{\max}} 2\lambda x \mathrm{d}x = \lambda(L_{\max}^2 - x^2) = A_0\frac{(L_{\max}^2 - x^2)}{L_{\max}^2} \tag{A2.2}$$

$$V_x = \int_x^{L_{\max}} h_x 2\lambda x \mathrm{d}x = \frac{2h_0\lambda}{3L_{\max}}(L_{\max}^2 - x^2)^{\frac{3}{2}} = V_0\left(\frac{L_{\max}^2 - x^2}{L_{\max}^2}\right)^{\frac{3}{2}} \tag{A2.3}$$

from which Eq. (A1.6) is verified.

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An overview of recent large catastrophic landslides in northern British Columbia, Canada

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Abstract

At least thirty-eight, large, catastrophic landslides, each either larger than 0.5 M m^3 or longer than 1 km, have occurred in northern British Columbia in the last three decades. The landslides include low-gradient flowslides in cohesive sediments, long-runout rock slides (rock avalanches), and complex rock slide-flows. The flowslides have occurred in a variety of sediments, including glaciolacustrine silt, clay-rich till, and clay-rich colluvium. The rock failures have happened in weak shale overlain by sandstone and volcanic rocks. The frequency of large landslides in northern British Columbia appears to be increasing, suggesting a link to climate change.
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Keywords: Large landslide; Climate change; Permafrost degradation; Northern British Columbia

1. Introduction

At least 38 rapid landslides larger than 0.5 M m^3 or with runouts longer than 1 km have occurred in northern British Columbia since 1973 (Fig. 1). They include long-runout landslides in rock, unconsolidated sediment, and in both rock and sediment (Fig. 2, Table 1). With one exception, the large rock slides have happened on slopes above glaciers ($n=10$), on sedimentary dip slopes ($n=2$), and on slopes below deforming mountain tops ($n=2$). The exception is a rock slide from a cliff face at low elevation on the outer BC coast. Soil landslides include flowslides (rapid earth flows) in glacial marine sediments ($n=2$), glacial lake sediments ($n=6$), and diamicton (till or colluvium) ($n=10$). Landslides involving both rock and sediment include rotational rock slide–earth flows ($n=2$), rock slide–debris flows ($n=2$), and a rock slide–debris avalanche. Our data set excludes debris flows, debris avalanches, and all landslides either less than 0.5 M m^3 or less than one kilometre in length. The number of large landslides that we have catalogued is a minimum for the number that have occurred in the last three decades due to the remoteness of the study region.

Infrastructure and resources at risk from these large landslides include settlements, forest roads and highways, pipelines, fish habitat, forests, and farmland. One rock avalanche came to rest within 2 km of the Alaska Highway, and another terminated within a few kilometres of a ranch house. Landslides have ruptured

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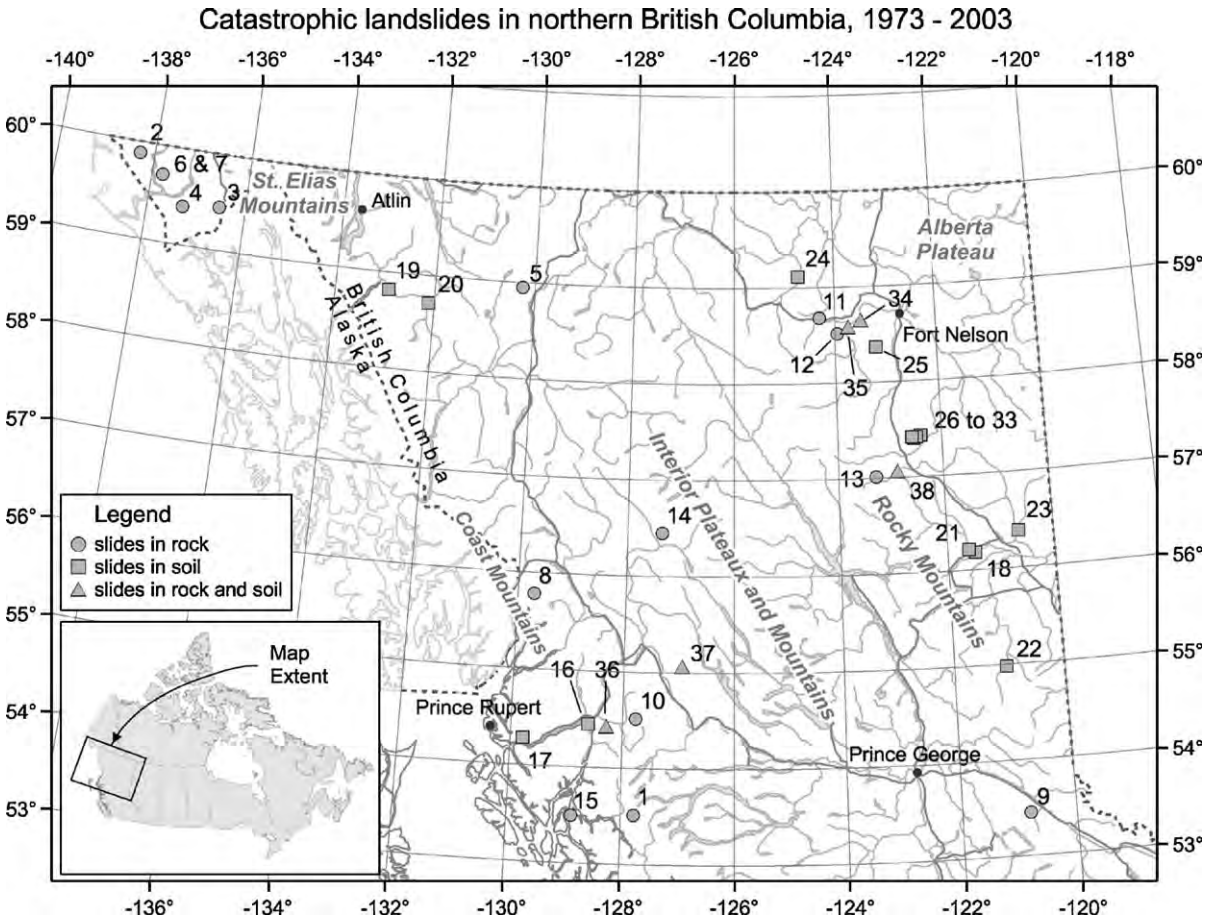

Fig. 1. Map of northern British Columbia showing locations of large, long-runout landslides between 1973 and 2003. See Table 1 for information on individual landslides.

natural gas pipelines in northern British Columbia in 1978, 1999, 2002 (Schwab et al., 2003), and 2003 (Schwab et al., 2004; Boultbee et al., 2006-this issue). Many of the landslides have impounded streams or rivers, thus the hazard associated with upstream inundation and catastrophic dam failure must also be considered (Clague and Evans, 1994).

Large landslides are apparently becoming more frequent in northern British Columbia. The increase may be due to climate change (Evans and Clague, 1999; Huscroft et al., 2004) and perhaps to glacial debuttressing (Holm et al., 2004) and permafrost degradation, as demonstrated in the European Alps (Davies et al., 2001; Bottino et al., 2002).

The objectives of this paper are to provide a brief overview of these large, long-runout landslides, examine the trend of increasing landslide frequency, and discuss the potential impacts of climate change on landslide occurrence in the region.

2. Setting

Northern British Columbia is a vast area, nearly 600 000 km^2 between 53° and 60° latitude, with a great diversity of landscapes (Holland, 1976), ecosystems (Meidinger and Pojar, 1991), climates, and surficial materials (Clague, 1989). On the west are the Coast and Saint Elias Mountains, which have a maritime climate and an extensive cover of snow and ice. East of the Coast Mountains are a series of plateaux and mountains with a more continental climate and less ice cover. Rivers in the interior flow in valleys that are incised into the plateaux and mountains. Most valleys contain thick fills of Quaternary sediments, which themselves have been dissected, leaving behind steep slopes bordering rivers. The plateau and mountain areas of the interior are bordered on the east by the northern Rocky Mountains, which mark the easternmost part of the western Cordillera. Still

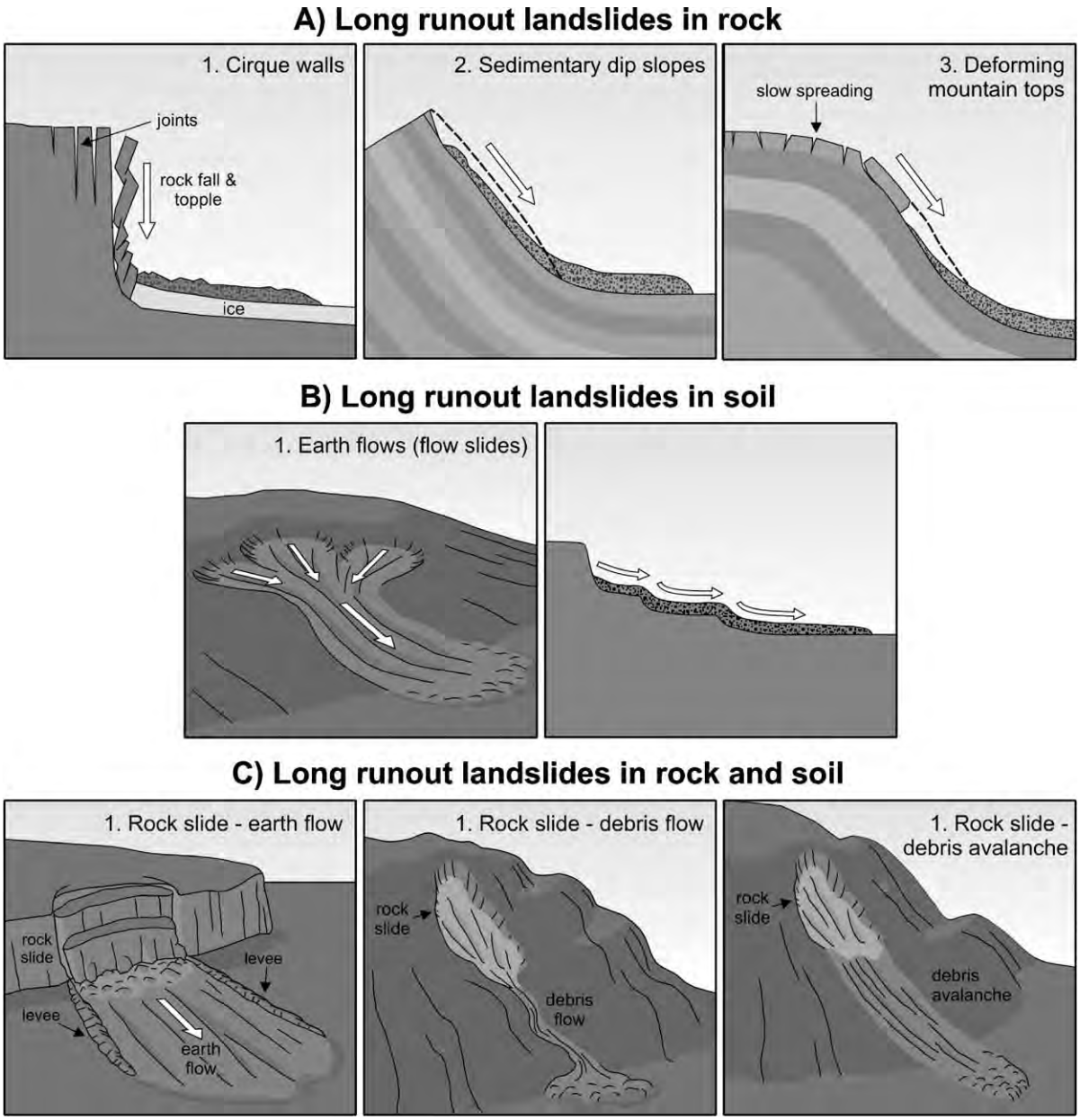

Fig. 2. Landslide types described in this study.

farther east is the Alberta Plateau, marking the periphery of the Interior Plains. This area has much less relief than areas to the west, although steep slopes delineate the margins of broad valleys that contain rivers draining the mountains to the west. The Alberta Plateau has a continental climate, characterized by very cold winters and warm summers. The high mountains of northern British Columbia support alpine permafrost, and some areas at lower elevation in the northernmost part of the province have patchy permafrost.

3. Methods

We obtained information on landslides in northern British Columbia from the literature and from our own studies. Previously unknown landslides were discovered by examining aerial photographs and satellite images. Due to the size and remoteness of the region, the area was not exhaustively examined, thus the number of landslides reported must be regarded as a minimum. Landslide ages were constrained by satellite and airphoto imagery, and in a few cases, by eyewitness

accounts. Landslide dimensions were determined from ortho-rectified images. We had detailed aerial photography flown for some landslides. Detailed digital elevation models were prepared for some landslides using pre- and post-failure photographs to determine landslide volume. Previously unreported landslides were visited in the field. Soil samples were collected, and stratigraphy and other physical features were noted.

Many of the landslides in our data set dammed rivers or streams. We examined many of the dams in the field and on airphotos. The dams were classified using the scheme of Costa and Schuster (1988) and include three types: (I) dams that do not cross the valley floor; (II) dams that span the entire valley floor, commonly extending onto the opposite slope; and (III) dams that fill the valley and extend both up and down valley.

4. Landslides in rock

Fifteen of the 38 catalogued landslides occur entirely in rock and can be termed rock avalanches. Three other landslides are rock slides that triggered even longer debris flows, and are discussed in *Landslides involving rock and soil*.

4.1. Landslides on rock slopes above glaciers

The majority of recent large rock avalanches in northern British Columbia have initiated on rock slopes above glaciers, principally in the Coast and St. Elias Mountains (Fig. 1). Since the Little Ice Age, most glaciers in British Columbia have thinned and retreated. The loss of ice has debuttressed slopes adjacent to glaciers, leading to local expansion of rock joints (Fig. 3) and bulging, cracking, and slow movements of rock masses (Bovis, 1982, 1990). Debuttressing has been implicated in many catastrophic landslides in high mountains in British Columbia by Evans and Clague (1999) and, more recently, by Holm et al. (2004).

Triggers may include intense rainfall or earthquakes. Schwab et al. (2003) attributed the 1999 rock avalanche at Howson Range (Fubar Glacier) (Fig. 4) to intense rainfall, and the 1999 rock avalanche at Kendall Glacier (Fig. 5; Couture and Evans, 2002) probably occurred during a summer cloudburst. In the latter case, an intense local storm cell accompanied the landslide (Bob Mitchell, Robson Valley Forest District, personal communication 1999), but was not recorded at the nearest climate station at McBride. The 1979 Saint Elias earthquake (M_s 7.2) triggered many large rock avalanches in southeastern Alaska (Lahr et al., 1979) and in adjacent regions of Canada, including Towagh Glacier (Evans and Clague, 1999), and possibly Tweedsmuir and Jarvis glaciers (Fig. 1; Table 1). Jibson et al. (2006-this issue) describe rock avalanches triggered by the 2003 Denali earthquake in southeastern Alaska. Other large rock avalanches, however, are not seismically triggered, including the rock avalanches at Frobisher Glacier (Fig. 6).

Most of these landslides probably initiate as topples and falls, but rapidly transform into rock avalanches as they travel over glaciers (Couture and Evans, 2002; Schwab et al., 2003) and undergo remarkable thinning (Fig. 7). Evans and Clague (1988) suggest that rock avalanches that travel over glaciers may have anomalously long runouts due to low friction at the debris-glacier interface. Height-over-length (H/L) ratios (Fig. 8) and the fahrböschungen (angles of reach) of these large rock avalanches are presented in Table 1. Fahrböschungen range from 11.3° to 22.3°, within the expected range of values for rock avalanches on glaciers (Scheidegger, 1973; Evans and Clague, 1999).

Most, but not all, of the rock avalanches terminated on glaciers. The landslides at Howson Range in 1978 and 1999 (Schwab et al., 2003) reached the valley floor at Telkwa Pass and ruptured a natural gas pipeline, disrupting service to the communities of Kitimat, Prince Rupert, and Terrace. The Howson landslides generated type II dams, and the lakes persist to this day.

4.2. Landslides on sedimentary dip slopes

The 1988 Tetsa rock avalanche (Fig. 9) and 1996 Chisca rock avalanche (Fig. 10) occurred on sedimentary dip slopes of 27° to 36° in the Rocky Mountain Foothills in northeastern British Columbia (Fig. 1; Table 1). They involved Permian to Carboniferous sedimentary rocks (Kindle Formation) and appear to be associated with fault zones (MacIntyre et al., 1998). The deposits of the two rock avalanches consist primarily of highly fragmented, angular sandstone rubble, with minor amounts of shale (Fig. 11). Rafts of soil and forest floor materials were noted on top of the rubbly debris.

The triggers for these landslides are not known. The Tetsa rock avalanche occurred on a sunny day in May. Its dust cloud was witnessed by a forestry crew working in the area (Myles Thorpe, Fort Nelson Forest District, personal communication, 2000). The Chisca landslide was dated using tree-ring techniques, which are not precise enough to evaluate a hydroclimatic trigger.

Table 1
Landslide data

No. on map	Name	Date	Volume (M m^3)	Length (km)	H/L	Fahrböschung (°)	Location (lat/long)	Reference
A. Landslides involving rock (long runout rock slides) s								
1. Cirque wall								
1	Howson I	1978					53° 31′ N, 127° 46′ W	
2	Tweedsmuir Glacier	1979		1.3	0.37	20.3	59° 53′ N, 138° 19′ W	Evans and Claque (1999)
3	Jarvis Glacier	1979		2.4	0.30	16.7	59° 27′ N, 136° 32′ W	Evans and Claque (1999)
4	Towagh Glacier	1979		4.4	0.20	11.3	59° 24′ N, 137° 17′ W	Evans and Claque (1999)
5	North Creek	1986	1–2	2.8	0.26	14.6	58° 57′ N, 130° 15′ W	Evans and Claque (1999)
6	Frobisher Glacier I	1990		3.1	0.34	18.8	59° 42′ N, 137° 47′ W	Evans and Claque (1999)
7	Frobisher Glacier II	1991		2.4	0.41	22.3	59° 42′ N, 137° 47′ W	Evans and Claque (1999)
8	Kshwan Glacier	Sept 92–May 93	3.2	2.3	0.31	17.2	55° 47′ N, 129° 42′ W	Mauthner (1995, 1996)
9	Kendall Glacier	1999	0.2	1.2	0.17	9.5	53° 27′ N, 120° 48′ W	Couture and Evans (2002)
10	Howson II	1999	1.5	2.7	0.48	25.6	54° 31′ N, 127° 46′ W	Schwab et al. (2003)
2. Sedimentary dip slopes								
11	Tetsa	1988		2	0.25	14.0	58° 41′ N, 124° 18′ W	
12	Chisca	mid 1990's	1	1.5	0.24	13.5	58° 31′ N, 123° 57′ W	
3. Mountain slopes associated with deformation								
13	Turnoff Creek	1992	4	2	0.28	15.6	57° 01′ N, 123° 17′ W	
14	Mosque Mountain	mid 1990's	5	1.2	0.42	22.9	56° 27′ N, 127° 21′ W	Lu et al. (2003)
15	Verney	Before 25 July 03		0.6	0.59	30.5	53° 30′ N, 128° 52′ W	
B. Landslides involving soil (flowslides)								
1. Glaciomarine sediments								
16	Mink Creek	Dec 93–Jan 94	2.5	1.2			54° 27′ N, 128° 37′ W	Geertsema et al., 2006-this issue-b
17	Khyex River	28 Nov. 2003	4.7	1.6			54° 17′ N, 129° 46.5′ W	Schwab et al. (2003)

2. Glaciolacustrine sediments								
18	Attachie	26 May 1973	12.4	1.5			56° 11′ N, 121° 29′ W	Evans et al. (1996)
19	Inklin	1979	2–3	0.7			58° 49′ N, 132° 56′ W	Geertsema (1998)
20	Sharktooth	1980	3–4	1.2			58° 43′ N, 132° 07′ W	Geertsema (1998)
21	Halfway	20 Aug 1989	1.9	0.7			56° 13′ N, 121° 36′ W	Bobrowsky and Smith (1992)
22	Quintette	5 May 1990	10	0.73			54° 59′ N, 121° 03′ W	Golder Associates (1990)
23	Flatrock	October 1997		0.65			56° 23′ N, 120° 39′ W	
3. Diamictons (mostly clayey tills)								
24	Scaffold Creek	mid 1990's		0.5			59° 07′N, 124° 43′ W	
25	Halden Creek	mid 1990's	5	0.6			58° 22′ N, 123° 12′ W	
26	Buckinghorse I	mid 1990's		1.75			57° 26′ N, 122° 24′ W	
27	Buckinghorse II	mid 1990's		1.0			57° 26′ N, 122° 24′ W	
28	Buckinghorse III	mid 1990's		1.77			57° 26′ N, 122° 24′ W	
29	Buckinghorse IV	mid 1990's		0.7			57° 24′ N, 122° 32′ W	
30	Buckinghorse V	mid 1990's		1.3			57° 24′ N, 122° 32′ W	
31	Buckinghorse VI	mid 1990's		0.8			57° 24′ N, 122° 32′ W	
32	Buckinghorse VII	mid 1990's		1.4			57° 25′ N, 122° 29′ W	
33	Buckinghorse VIII	mid 1990's		0.65			57° 25′ N, 122° 34′ W	
C. Landslides involving rock and soil								
1. Rock slump–earth flows								
34	Muskwa	1979	15	2.2			58° 39′ N, 123° 29′ W	
35	Muskwa–Chisca	July 2001		1.5			58° 35′ N, 123° 44′ W	
2. Rock slide–debris flows								
36	Zymoetz	8 June 2002	1.6	4.3	0.29	16.3	54° 26′ N, 128° 18′ W	Boultbee et al. (2006-this issue)
37	Harold Price	22–23 June 2002	1.6	4	0.18	9.9	55° 04′ N, 126° 57′ W	Schwab et al. (2003)
3. Rock slide–debris avalanche								
38	Pink Mountain	June 2002	1	2	0.21	11.6	57° 04′ N, 122° 52′ W	Geertsema et al., 2006-this issue-b

Fahrböschungen (Table 1) are relatively low: 14.0° and 13.5° for the Tetsa and Chisca landslides, respectively. The Tetsa landslide initiated at 1500 m asl, descended to 940 m asl, and ran 100 m up the opposite slope. The total travel distance is 2240 m. The Chisca landslide ran out onto saturated permanently frozen organic soil (muskeg) with a 60 cm thick active layer. Its low H/L ratio (Fig. 8) likely relates to these conditions.

The Tetsa and Chisca landslides did not damage streams, but considerable areas of forest were lost. The Tetsa landslide stopped within 2 km of the Alaska Highway.

4.3. Landslides on slopes below deforming mountain tops

Mountain-top spreading is common in sedimentary rocks in northeastern British Columbia. Several recent catastrophic rock avalanches are associated with such deformation, including the Mosque Mountain (Lu et al., 2003) and Turnoff Creek (Fig. 12; Bednarski, 1999) rock slides. The 2002 Pink Mountain landslide (Geertsema et al., 2006-this issue-b) also occurred in an area of mountain-top deformation, but it is included in the section *Landslides involving rock and soil* because it transformed into a debris avalanche. The Mosque Mountain and Turnoff Creek landslides are not precisely dated, thus their triggers are unknown. Their H/L ratios are 0.28 and 0.42, and their fahrböschungen are 15.6° and 22.9°, respectively.

Fig. 4. Howson rock avalanche. Note cliffs (1), pipeline (2), powerline (3), and new lake (4).

Damage from these landslides includes forest site loss and impoundment of Turnoff Creek. The Turnoff Creek landslide dam is composed of angular rubble and

Fig. 3. Vertical joints that have opened in response to debuttressing adjacent to Howson Glacier west of Smithers.

Fig. 5. Rock avalanche at Kendall Glacier, 45 km northwest of McBride. The runout length is 1200 m. Photo courtesy of Carl Erickson, BC Forest Service.

cohesive soil, and is a type II dam. The small lake dammed by the debris persists to this day.

4.4. Other landslides

The Verney landslide, on the northern British Columbia coast (Fig. 1; Table 1), does not fit into the above categories. It is visible on a 23 July 2002 Landsat 7 image, but not a 20 July 2001 image. The landslide is a rock avalanche, probably initiated as a rock fall at 660 m elevation, low compared to the other rock avalanches. The landslide travelled 630 m, over a vertical range of 370 m, giving an H/L ratio of 0.59 and a fahrböschung of 30.5°.

5. Landslides in soils

Eighteen of the 38 large landslides in northern British Columbia involve only soil and are classified as flows or spreads (Cruden and Varnes, 1996) or flowslides (Hungr et al., 2001). Some of these landslides initiate at eroding riverbanks and retrogress

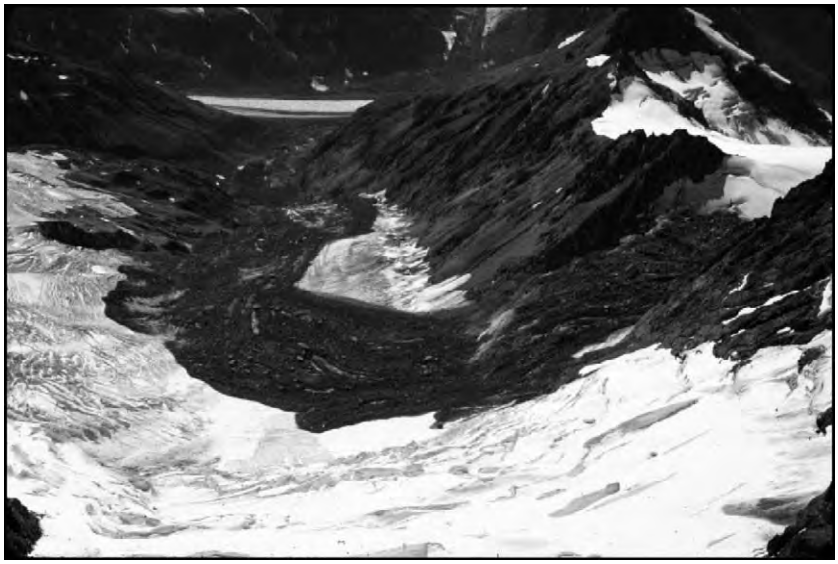

Fig. 6. Large rock avalanche at Frobisher Glacier, Saint Elias Mountains, northwestern British Columbia.

Fig. 7. Thin rock avalanche debris covering Jarvis Glacier. The landslide was triggered by a magnitude 7.2 earthquake in southeastern Alaska in 1979.

upslope (Geertsema, 1998). As material slides or flows into the river, toe support is lost, causing more material to move and creating another scarp. Transverse ridges and prisms indicate retrogressive translational movements along nearly horizontal rupture surfaces. These landslides may also fail progressively, for example where a load is placed some distance from the break in slope. In layered, normally consolidated soils, high pore pressures can develop along silty or sandy layers. Spreading and flowing can occur when these pore pressure approach overburden pressures. Subsurface liquefaction may be accompanied by surface

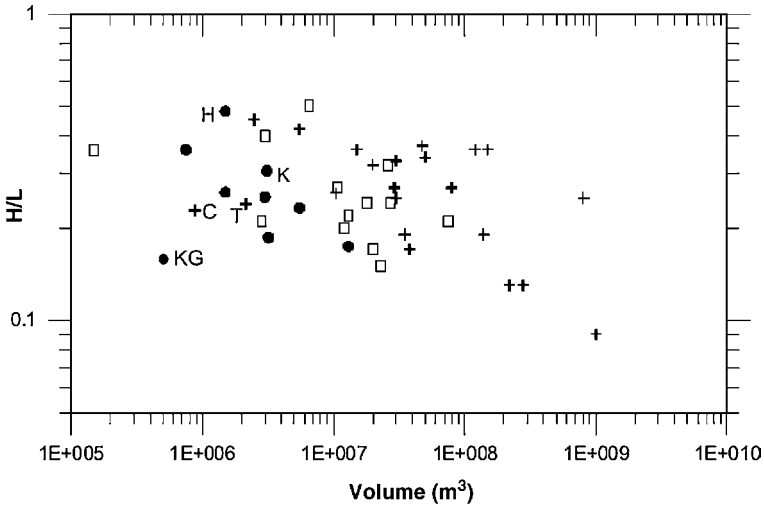

Fig. 8. Plot of rock avalanche volume vs. H/L for non-glacial rock avalanches (+), rock avalanches in glacial environments from other parts of the world (□), and rock avalanches in glacial environments in British Columbia (●). K = Kshwan Glacier rock avalanche; KG = Kendall Glacier rock avalanche; H = Howson II rock avalanche; T = Tetsa rock avalanche; C = Chisca rock avalanche which ran out over permanently frozen muskeg. (Modified after Evans and Clague, 1999.)

Fig. 9. The 1988 Tetsa rock avalanche in the foothills of the northern Rocky Mountains. The runup (arrow) on the slope opposite the detachment zone is 100 m.

lowering and simultaneous movement over a large area.

A long period of bank erosion may precede failure and rapid movement. In cases where a brittle mass overlies a weak layer, slow deformation and fracturing commonly precede catastrophic failure and rapid movement. Large flowslides are preceded by prolonged, wetter-than-normal weather that allows porewater pressures to build up in the soil.

5.1. Landslides in glacial marine sediments

Large rapid landslides are common in sensitive glacial marine sediments in eastern Canada and Scan-

Fig. 10. The 1996 Chisca rock avalanche on a dip slope in the Rocky Mountain Foothills. The landslide ran out on to permanently frozen muskeg (1).

Fig. 11. Angular sandstone rubble of the Tetsa rock avalanche.

dinavia, and to a lesser extent in Alaska. They are also common in fjords in northern British Columbia (Geertsema and Schwab, 1997; Geertsema, 1998). Retrogressive earth flows occurred in northern British Columbia in December 1993 or January 1994 (2.5 M m^3) at Mink Creek (Figs. 1 and 13; Table 1; Geertsema et al., 2006-this issue-a), and on 28 November 2003 (4 M m^3) at Khyex River (Figs. 1 and 14; Table 1; Schwab et al., 2004). Two flowslides at Lakelse Lake in 1962 were triggered by site loading (Clague, 1978, 1984; Evans, 1982).

Glacial marine sediments become sensitive, in part, through leaching or diffusion of salt from the porewater (Torrance, 1983). The sediments at Mink Creek and Khyex River have salt contents below 1 g per litre. Those at Mink Creek meet the definition of quick clay by having sensitivities greater than 30 and remoulded shear strengths less

Fig. 12. The 1992 Turnoff Creek rock avalanche was associated with deep-seated mountain slope deformation (arrows).

Fig. 13. Oblique aerial photograph of the 1994 Mink Creek flowslide near Terrace. Note the lake formed by the type II landslide dam and the nearly flat slope of the landslide.

than 0.5 KPa (Tables 2–4; Geertsema and Torrance (2005)).

A decade of warmer and wetter conditions and a warm wet fall preceded the Mink Creek flowslide (Geertsema et al., 2006-this issue-a). However, most flowslides, including the Mink Creek and Khyex River events, are triggered by bank erosion (Bjerrum et al., 1969; Lebuis et al., 1983; Tavenas, 1984). Other triggers include earthquakes (the 1964 Turnagain Heights landslide in Anchorage; Updike et al., 1988) and site loading (Rissa, Norway; Gregersen, 1981; Lakelse Lake, Clague, 1978; and Kitsault, Septer and Schwab, 1995).

The gradients of the Mink Creek and Khyex flowslides are 3° or less, with an R/H value of 30 at Mink

Fig. 14. The 2003 Khyex River earthflow in glacial marine sediments. The landslide ruptured a natural gas pipeline (white arrows), disrupting service to the city of Prince Rupert for about 10 days. Note the type III landslide dam, created where material flowed up and down river. Photo courtesy Prince Rupert Royal Canadian Mounted Police.

Table 2
Range of grain size distributions from selected landslides

Grain size	Glacial marine (Mink Ck. slide)	Glacial lake (Attachie slide)	Clayey till (Halden slide)	Clayey till (Muskwa slide)
Sand (%)	0–13	8–32	21–22	1–28
Silt (%)	44–62	34–74	47	21–55
Clay (%)	45–58	26–65	30.5–32	31–78

Creek. The Mink Creek landslide shows evidence of both spreading (Fig. 15; Eden et al., 1971; Evans and Brooks, 1994) and flowing (Geertsema et al., 2006-this issue-a). The Khyex River landslide is a flow, with few transverse ridges (Schwab et al., 2004). Examples of similar flows include the 1971 St. Vianney landslide in Québec (Tavenas et al., 1971) and the Rissa landslide in Norway (Gregersen, 1981).

The Mink Creek and Khyex landslides caused considerable damage. A type II dam filled Mink Creek, an important salmonid stream, over a distance of 1200 m. It inundated another 1200 m of the valley upstream to beyond a Canadian National Railway trestle. The lake remains, although the water level has lowered. The landslide also destroyed 43 ha of forest. The Khyex River landslide filled Khyex River, also an important salmonid river, over a distance of 1700 m. The displaced material travelled up and down stream, creating a type III dam. The dam persisted until mid or late September 2004. The landslide destroyed 32 ha of forest and flooded riparian forests up to 10 km upstream. It ruptured a natural gas pipeline, cutting service to the city of Prince Rupert for about 10 days.

5.2. Landslides in glacial lake sediments

Glacial lake sediments are common in many valleys in northern British Columbia (Clague, 1989). Most of the sediments were deposited at the beginning and end of the last Pleistocene glaciation. Those deposited at the beginning of the last glaciation were overridden by thick glacier ice and, consequently, are overconsolidated and dense. Late-glacial lake deposits were not overridden by glaciers and are normally consolidated. Large rapid landslides are largely restricted to advance-phase glacial lake sediments in preglacial buried valleys (Fig. 16) in Alberta (Cruden et al., 1997; Lu et al., 1999) and British Columbia (Geertsema, 1998; Geertsema and Schwab, 2004). An exception is the 1990 landslide at Quintette Mine on Murray River (Fig. 1; Table 1), which apparently occurred in sensitive clayey silts with thin sand strata that are not overlain by till (Golder Associates Ltd., 1990). The 1989 Halfway River landslide (Bobrowsky and Smith, 1992) had two distinct surfaces of rupture, an upper one in till and a lower one in lake sediment.

In some cases, there is ambiguity as to whether a landslide involves till or advance-phase lake sediments. The surface of rupture commonly is not exposed, and the covering material is not representative of the in situ sediment associated with the failure surface. Without drilling or exposures, the nature of the material at the rupture surface remains unknown.

The Attachie flowslide, which dammed Peace River (type II dam) for approximately six hours in 1973 (Evans et al., 1996; Fletcher et al., 2002), occurred in glacial lake sediments filling the ancestral Peace River valley. The failed slope likely had been moving for thousands of years. The landslide thus involved colluvium as well as glacial lake sediments. Fletcher et al. (2002) suggest that pre-shearing of lake sediments may have played an important role in this landslide and other flowslides in similar materials. Geotechnical data for the Attachie landslide are summarized in Tables 2–4.

The Inklin and Sharktooth landslides in northwestern British Columbia also occurred on slopes developed in buried valley fills (Geertsema, 1998). In these cases,

Table 3
Atterberg limits

Atterberg test	Glacial marine (Mink Ck. slide)	Glacial lake (Attachie slide)	Clayey till (Halden slide)	Clayey till (Muskwa slide)
Liquid limit (%)	30–35	42.5	36.6–40.5	32–40
Plastic limit (%)	17–22	22.9	17.5–19.8	19–25
Plasticity index	10–18	19.6	19.1–20.7	9–17
Activity	0.26–0.42	0.31	0.63–0.65	0.26–0.41

Table 4
Strength characteristics

Strength test	Glacial marine (Mink Ck. slide)	Glacial lake (Attachie slide)	Clayey till (Halden slide)	Clayey till (Muskwa slide)
Undisturbed shear strength (kPa)	46	–	–	215
Remoulded shear strength (kPa)	0.65	–	–	119
Sensitivity	72	–	–	1.8
Direct shear (kPa)	n/a	230	–	–

Fig. 15. Prism of glacial marine sediments in the Mink Creek landslide. The prism is part of a transverse ridge that formed by translational movement along a nearly horizontal rupture surface (dashed line). Arrow indicates direction of movement.

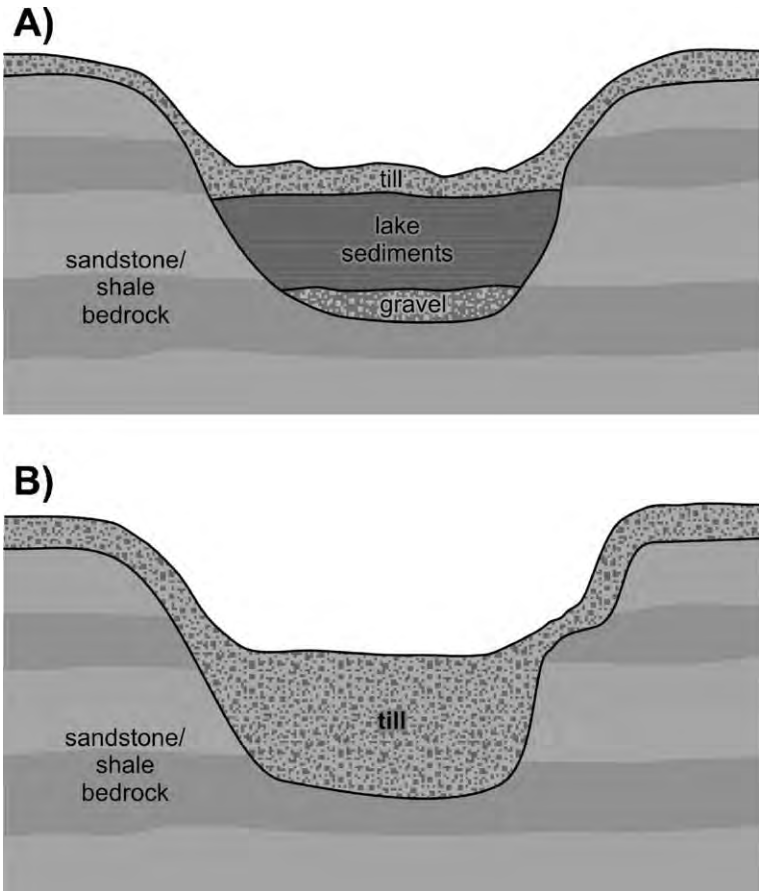

Fig. 16. Schematic drawing of preglacial valley fills: A) advance-phase glacial lake sediment is covered by till; B) till fills the entire valley.

the lake sediments fill narrow tributary valleys, thus the landslides are more confined and narrower than the Attachie landslide. The Sharktooth landslide had a length of 1200 m and extended approximately 800 m into the hillslope (Fig. 17). It covered an area of about 40 ha and had a volume of 3–4 M m^3. It was likely retrogressive and was triggered by bank erosion at the outside of a bend in the Sheslay River. The surface of the landslide is marked by ridges that translated along a nearly horizontal rupture surface and that resemble prisms in other translational flowslides. These features, and the extent of retrogression (R/H of about 50), suggest that the material associated with the slide, while perhaps not sensitive, was very weak (Geertsema, 1998).

The 1997 Flatrock landslide also occurred in a buried valley, but it has a much longer width than length. This landslide, like the Sharktooth landslide, has spectacular transverse ridges (Fig. 18), indicating translational retrogressive movement.

All of the flowslides in glacial lake sediments impounded streams (type I and II dams) and damaged forests. The 1979 Inklin landslide (type II dam) dammed Inklin River for about one month, creating a lake 20 m deep and 12 km long (Geertsema, 1998).

5.3. Landslides in till

Some of the most spectacular and rapid flowslides in British Columbia have occurred in diamicton interpreted to be till (Fig. 1; Table 1). Till has not commonly been linked to rapid, low-gradient flowslides, but ten of the landslides in our inventory are in this material. None has been precisely dated, but all appear to have occurred in the mid-1990s. Eight of the ten landslides occurred in the Buckinghorse River area, along with additional unrecorded smaller flowslides and numerous older large landslides. All of the landslides appear to be associated with preglacial buried valley fills (Fig. 16). Two landslides at Muskwa River are included in the category *Landslides involving soil and rock*, because they are complex, involving both till and bedrock.

Till in northeastern British Columbia is derived largely from Cretaceous shale and sandstone (Mathews, 1980). The shale breaks down more readily than sandstone and imparts a fine texture to the till matrix. The

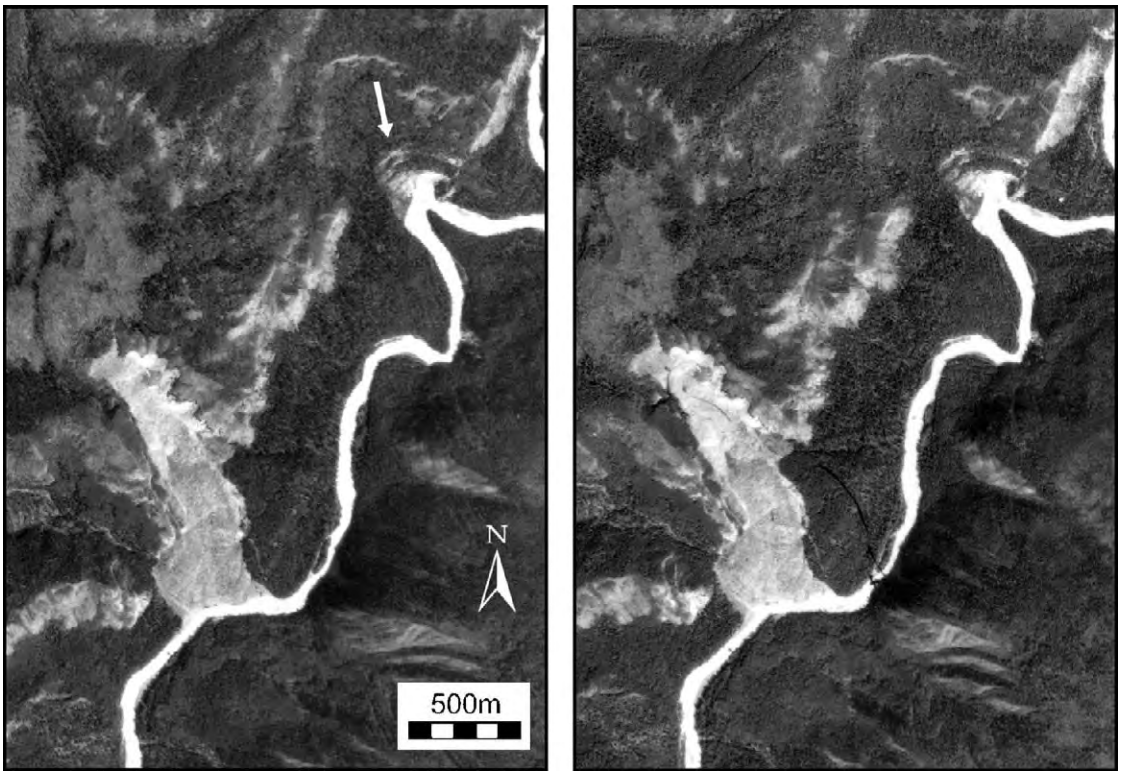

Fig. 17. Photo stereopair of the Sharktooth landslide, a flowslide in glacial lake sediments overlain by till along Sheslay River. Note the incipient landslide to the north (arrowed). Province of British Columbia airphotos BC5614: 209, 210.

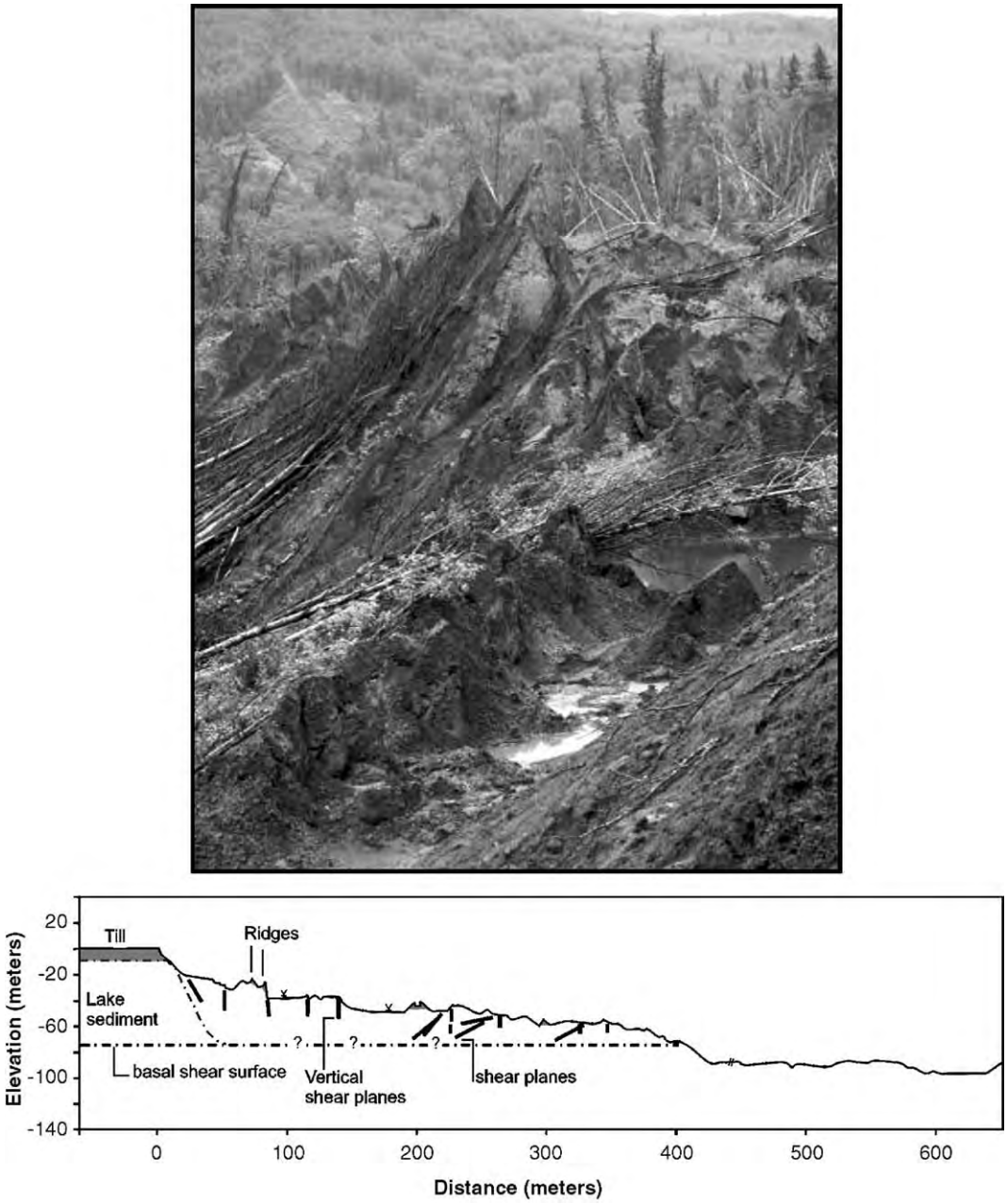

Fig. 18. Top: Transverse ridge, indicative of retrogressive translational movement, at the 1997 Flatrock landslide. The ridge is about 6 m high. Bottom: long profile of the Flatrock landslide showing ridges, shear planes, and a horizontal rupture surface.

till typically has a low stone content and a low to medium plastic clay matrix (Tables 2–4).

The landslides at Halden Creek and Scaffold Creek may have been caused by bank erosion. In contrast, the landslides at Buckinghorse River are perched high above incised streams and thus require other causes and triggers. Earthquakes in the area have been too small to trigger landslides (Keefer, 1984).

The Buckinghorse River landslides (Figs. 19, 20) are retrogressive and extremely mobile, with travel distances up to 1765 m along gradients as low as 3°. The abundance of flowslides in this area in the 1990s suggests a climatic link. The warming trend at that time (Fig. 21) may have contributed to degradation of permafrost or to seasonal changes in precipitation that could have triggered landslides in the Buckinghorse River basin.

Fig. 19. Two coalescent flows in diamicton at Buckinghorse River (foreground). The travel distance is greater than 1.7 km.

All of the documented till flowslides produced type I or II dams. Dams on rivers, such as Buckinghorse River, appear to have been short lived (hours to days), but dams on tributary streams remain to this day.

6. Landslides involving rock and soil

The landslides documented in this section are complex, involving both rock and soil and more than one mode of movement.

6.1. Rock slump–earth flows

The 1979 Muskwa (Fig. 22) and 2001 Muskwa–Chisca (Fig. 23) landslides, located west of Fort Nelson (Fig. 1; Table 1), initiated as slumps in flat-lying shale and sandstone (MacIntyre et al., 1998). Slumping triggered earth flows in cohesive till through the process of undrained loading (Hutchinson and Bandhari, 1971). The earth flows have conspicuous levees (Corominas, 1995) along their lateral margins (Fig. 24), indicating that they were viscous.

The 1979 Muskwa landslide had a volume of 15 M m^3, covered an area of 179 ha, and travelled 3.25 km on an average slope of 3.4°. It is the largest of the landslides reported in this paper. Geotechnical properties of the landslide debris are provided in Tables 2–4. The trigger is unknown.

The Muskwa–Chisca landslide occurred in July 2001 (Doug Mckee, Fort Nelson, personal communication, 2001). The landslide is 1.5 km long and covers an area of 43 ha. Heavy rains may have triggered the initial rotational failure (Fig. 25).

Both landslides impounded watercourses and destroyed forests. The Muskwa landslide has a type II dam that has been only partially breached by the stream. The smaller Muskwa–Chisca landslide created a much larger impoundment with a type I dam.

6.2. Rock slide–debris flows

Two large rock slide–debris flows occurred in northwestern British Columbia in June 2002 (Schwab et al., 2003; Fig. 1; Table 1)—the Zymoetz (Copper) River landslide on 8 June (Boultbee et al., 2006-this issue) and the Harold Price landslide (Fig. 26) between 22 and

Fig. 20. Three large rapid earth flows and many smaller ones in diamicton at Buckinghorse River. British Columbia Forest Service airphotos IAS(02)54474: 195 (June 21, 2002).

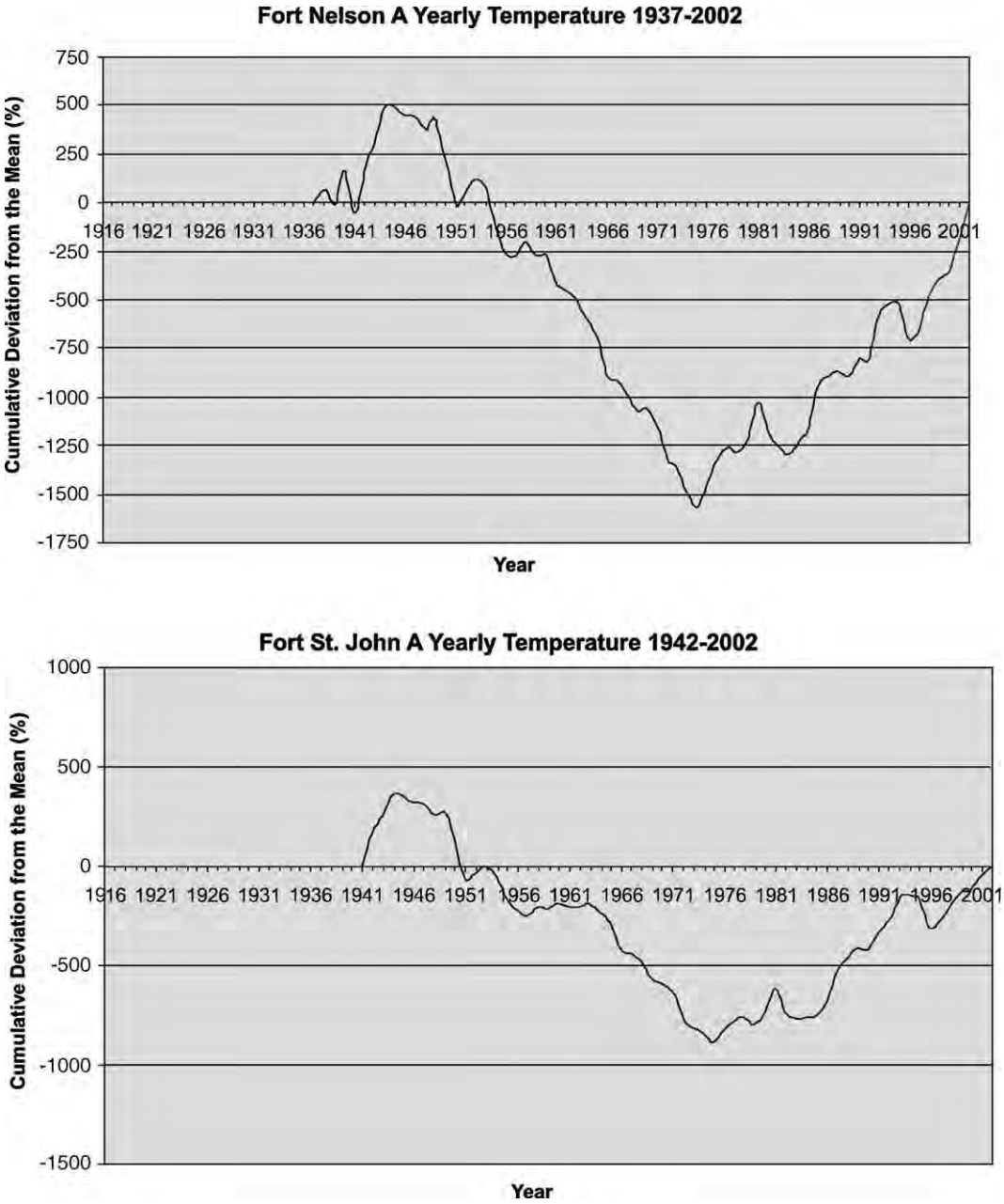

Fig. 21. Graphs of cumulative deviation of yearly mean temperature for Fort Nelson and Fort St. John. The graphs indicate nearly three decades of increasing temperature.

24 June. The Pink Mountain rock slide–debris avalanche (Geertsema et al., 2006-this issue-b), described in *Rock slide–debris avalanches*, and the McCauley Mountain rock slide in southern British Columbia (Evans et al., 2003) also occurred at this time. The Verney rock slide, described in *Landslides in Rock*, may also have happened at this time. The landslides are associated with delayed melting of an above-normal snowpack (Schwab et al., 2003).

The Zymoetz landslide (1.6 M m^3) originated at 1390 m asl on a steep cirque headwall. Rubble entered a channel and induced a debris flow. An estimated 0.5 M m^3 of debris, including blocks up to 7 m in diameter, dammed Zymoetz River (type II dam) causing flooding 1.5 km upstream. Although the dam was overtopped almost immediately, it is still an obstruction to river flow. The landslide travelled a distance of 4.3 km, dropping 1255 m in

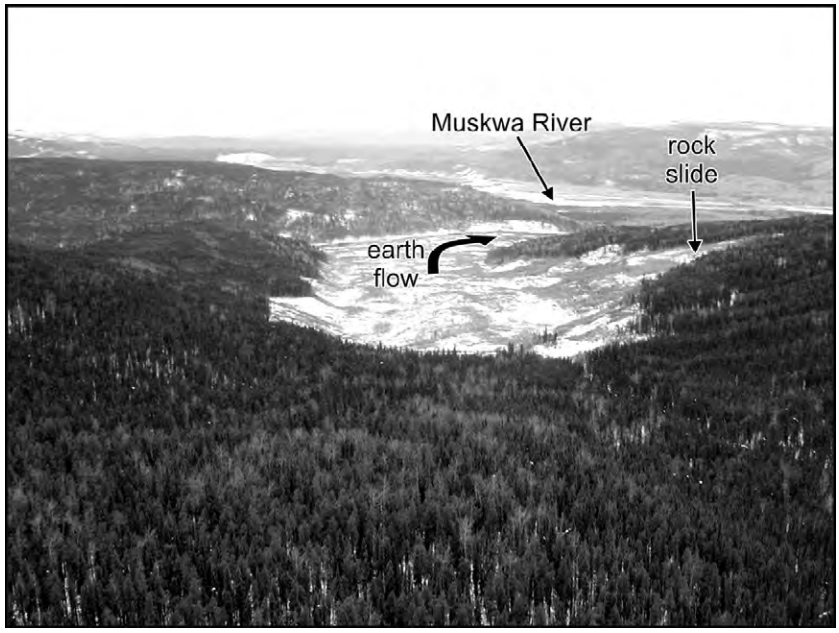

Fig. 22. The 1979 Muskwa landslide in clay-rich diamicton. The earth flow was triggered by a slump in sandstone. The distance from the crown of the landslide to the tip is 3.25 km.

elevation over this distance. The fahrböschung is 16.3°.

The Harold Price landslide originated at 1723 m asl at the lip of a southwest-facing cirque occupied by a rock glacier. Interstitial ice was observed in the scarp face after the landslide. Debris dropped 300 m into the valley, expanding to a width of about 360 m and rapidly accelerating. After travelling 1.3 km, the landslide transformed into a debris flow, which became channelized 2.2 km from the source. The total travel length of the landslide is 4 km, but a hyperconcentrated flow carried sediments and logs an additional 3.5 km down Harold Price Creek. The volume of the landslide is about 1.6 M m^3 and its fahrböschung is 9.9°.

Both landslides damaged forest and fish habitat. The Zymoetz landslide also ruptured a gas pipeline, interrupting service to the cities of Kitimat, Terrace, and Prince Rupert and blocking access to a 3000 km^2 basin for more than one year due to the flooding of the road adjacent to the river. Schwab et al. (2003) estimate the indirect costs of the Zymoetz and Harold Price landslides to be 27.5 and 1.6 M Canadian dollars, respectively.

6.3. Rock slide–debris avalanche

A 2-km-long landslide occurred at Pink Mountain (Geertsema et al., 2006-this issue-b) in late June or early July 2002. The Pink Mountain landslide is a rock slide-debris avalanche according to the classification of Hungr et al. (2001). Geertsema et al. (2006-this issue-b) describe extensive mountain top deformation above the landslide and argue that the landslide may have been triggered by the delayed melt of an above-normal snowpack, followed by a week of intense rainfall.

The landslide has a relatively low fahrböschung of 11.6° (Table 1). Geertsema et al. (this volume) suggest that the excess mobility of the landslide is due to rapid undrained loading of till by the initial rock slide.

The landslide destroyed 43 ha of non-commercial forest, covered an access road, and came to rest within a few kilometres of a ranch house.

7. Discussion and conclusions

In this overview, we have attempted to show the importance of recent large landslides in northern British Columbia. Recent catastrophic and long-runout landslides occur in a variety of environments and materials in this region. Some landslides initiate in bedrock on high, steep mountain slopes, whereas others occur at low elevation in a variety of glacial sediments, notably in buried valleys. Our data suggest that landslides in this part of British Columbia are increasing, which warrants further discussion.

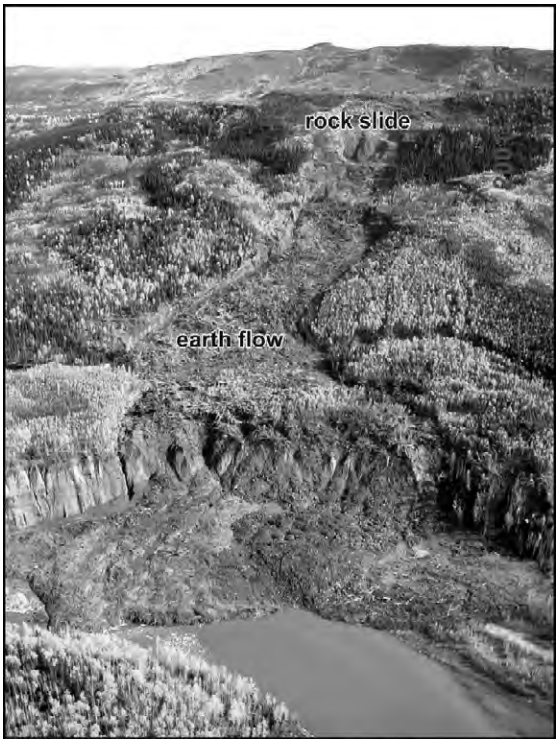

Fig. 23. The 2001 Muskwa–Chisca earth flow, triggered by a slump in sandstone at the confluence of Muskwa and Chisca rivers. The irregular topography of the slope is the product of older landslides.

An average of 1.3 large, rapid landslides has occurred annually over the last three decades. Twenty eight of the 38 catalogued landslides have happened within the last 15 years, an average of 1.4 landslides per year. Possibly up to 23 of the landslides have occurred in the last decade, yielding an average of 2.3 landslides per year. This translates to about 0.4 catastrophic landslides per 100 000 km^2 annually over the last decade in the study area. The apparent increase in landslides begs the question: Is landsliding in northern British Columbia sensitive to climate forcing?

Landslides in mountainous terrain are strongly influenced by climatic factors, including precipitation and temperature (Evans and Clague, 1994). Catastrophic landslides at high elevations may be particularly responsive to increases in temperature. Researchers have suggested that recent melting of glaciers in British Columbia has debuttressed rock slopes adjacent to glaciers, causing deep-seated slope deformation and catastrophic failure (Clague and Evans, 1994; Holm et al., 2004). Although a significant number of the rock avalanches in our inventory were seismically triggered, we attribute the ten rock avalanches on glaciers to such debuttressing.

Alpine permafrost may be degrading under the present warmer climate, decreasing the stability of slopes (Davies et al., 2001; Harris et al., 2001). Recent large rock avalanches in the European Alps have been attributed to the melting of mountain permafrost (Dramis et al., 1995; Bottino et al., 2002), and this phenomenon may also play a role in initiating landslides in northern British Columbia, as in the case of the Harold Price landslide (Schwab et al.,

Fig. 24. Levee on the Muskwa–Chisca landslide.

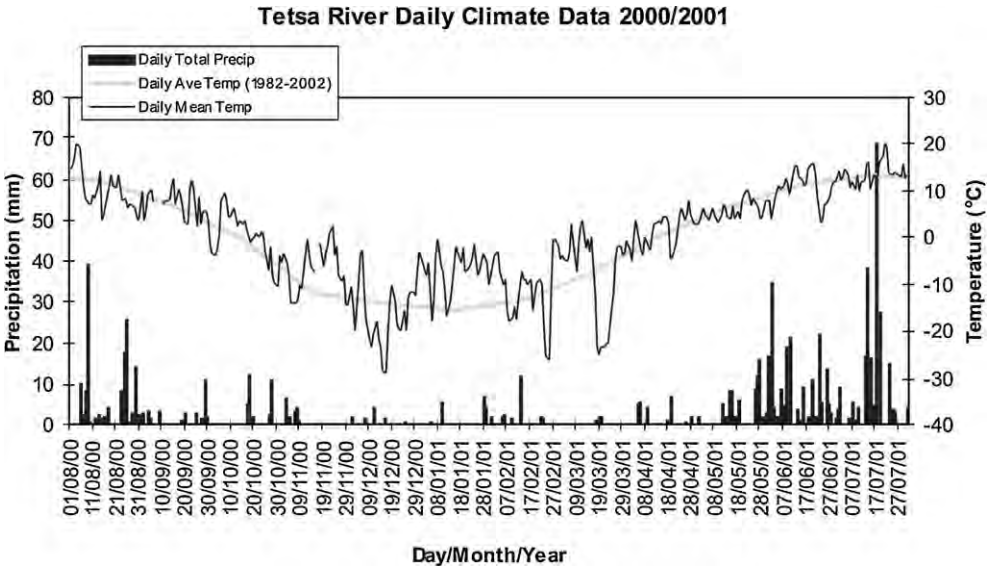

Fig. 25. Climate data associated with the Muskwa–Chisca landslide. The landslide may have been triggered by intense rainfall in July 2001.

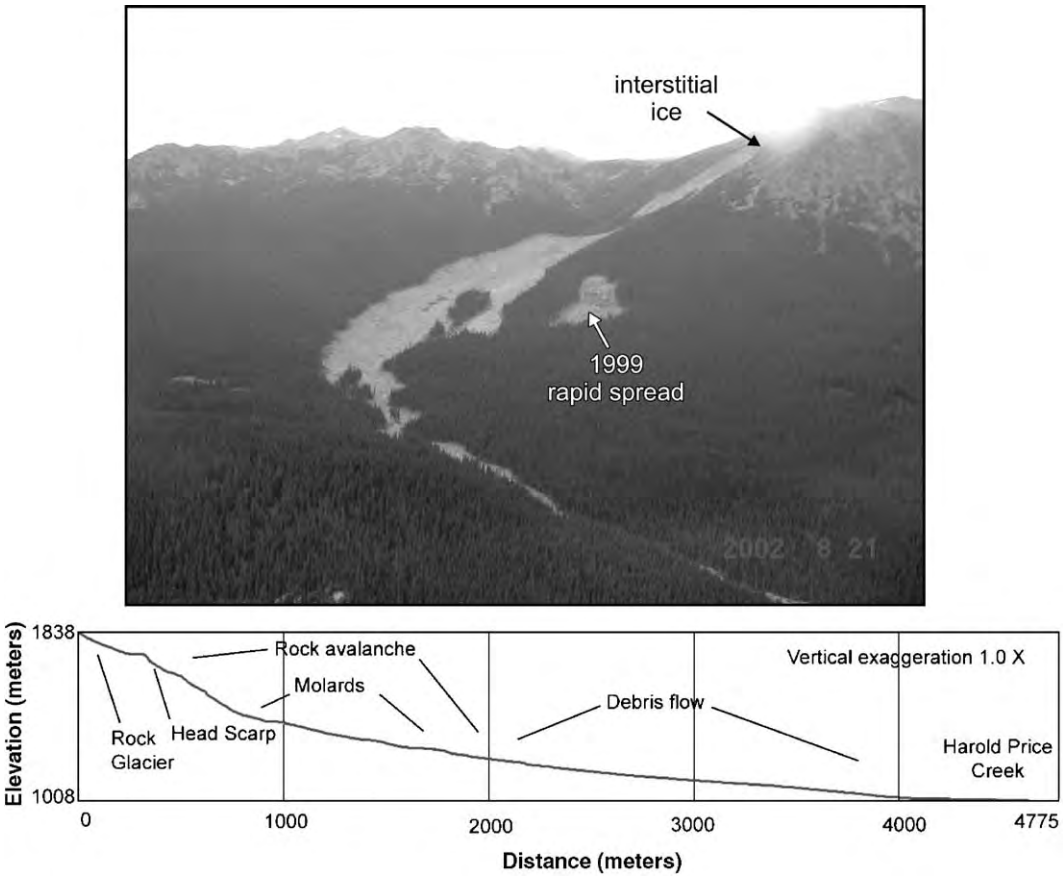

Fig. 26. Top: The 2002 Harold Price rock slide–debris flow. The smaller landslide to the right occurred in 1999. Bottom: profile of the landslide path.

2003). Spatial and temporal clustering of eight large flowslides and other smaller ones in the Buckinghorse River area raise the possibility that they were triggered by melting of permafrost.

The Mink Creek flowslide occurred after nearly a decade of increasing temperature and precipitation. Geertsema and Schwab (1997) provide evidence for an increase in flowsliding 2000 to 3000 years ago in the Terrace area under wetter climatic conditions. Almost all global circulation models predict warmer and wetter conditions in the future for the Terrace area (Geertsema et al., 2006-this issue-a), thus more such landslides may be expected in this area.

Many of the landslides discussed in this paper dammed watercourses. While some of the dams were short-lived, others still remain. The longevity of dams depends in part on the rate of inflow to the impoundment, size and shape of the dam, and its geotechnical properties (Costa and Schuster, 1988). In our data set many large dams on small streams persist, even though lake levels have lowered due to partial incision of the dams. The dams are more likely to persist if they consist of diamicts or blocky rubble. Few dams last for more than a day on significant rivers. Exceptions include the flowslides on the Inklin and Khyex rivers, and the rock slide–debris flow on the Zymoetz River. None of the dams that we have documented failed catastrophically.

Evans and Clague (1999) hypothesized that rock avalanches in glacial environments have greater mobility than those in non-glacial environments (Fig. 8) due to the low friction at the interface of the moving debris and ice. Friction may be further reduced as water films form, and pore pressures develop, at the base of the debris due to frictional heating or compression of snow on the glacier surface. The Chisca rock avalanche (Fig. 10), which ran out on saturated, permanently frozen muskeg, shows similar enhanced mobility (see C in Fig. 8). This suggests that reduction of friction at the base of moving debris through undrained loading of a thin layer of saturated soil in the active layer is similar to that of rock avalanche debris traveling over snow and ice. To our knowledge, this is the first report case of enhanced rock avalanche mobility due to permafrost.

In summary, large landslides are more common in northern British Columbia than previously thought. The landslides are of a range of types and occur in both rocks and soils. The causes and triggers are numerous, but climate warming in recent decades has probably increased the incidence of catastrophic slope failure in northern British Columbia.

Acknowledgements

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From: Bud Ullman
To: PDS comments
Subject: Comments on the Proposed Comprehensive Plan 2016 Update
Date: Friday, April 01, 2016 3:27:21 PM

I have been a Guemes Island property owner and taxpayer for seven years and in addition a resident and voter for four years. I am a member of the Guemes Island Ferry Committee and work with the Guemes Island Community Center Board.

Thank you for taking up the Guemes Island Sub-Area Plan that is the result of 2 years of work and was adopted by the County over 5 years ago. It is long overdue for completion in order to keep faith with the community.

I support he GIPAC recommendations, specifically the proposed Guemes Island Zoning Overlay and codification of the Seawater Intrusion Policy. These thoughtful and well-ventilated recommendations are needed to protect the island's rural character and avoid developments out of scale with existing homes.

And of course protection of the island's sole-source aquifer is essential. While more work is needed on this matter, the recommendation is an important first step.

Thank you again for your work on these important issues.

Carl Ullman

5162 West Shore Road

541-892-0410

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RECEIVED
APR 05 2016
SKAGIT COUNTY
PDS

Edith Walden
6203 S Shore Rd
Guemes Island, WA 98221
April 5, 2016

Skagit County Planning and Development Services
1800 Continental Place
Mount Vernon, WA 98273

Re: Skagit County 2016 Comprehensive Plan Update

Dear Skagit County Planning and Development Services:

I have lived full time on Guemes Island for 10 years, after being a part-time islander for 11 years. I served as the chair of the Guemes Island TV and Internet Advisory Committee when it appeared that the island would lose its sole source of cable TV and Internet service. I served as secretary on the South Shore Road Advisory Committee to try to solve the problem of the erosion of one of the island's main roads that is falling into the Guemes Channel. And I am the editor-in-chief and lead reporter of the island's community newspaper, the *Guemes Tide*.

It has taken the citizens of Guemes Island 25 years to arrive at this point of having an opportunity to implement some of the recommendations from the Guemes Island Subarea Plan. Thirty five islanders have served on the Guemes Island Planning and Advisory Committee (GIPAC) in those years, volunteering their time and expertise, and working with county staff, professional groups, and other governmental agencies, in addition to communicating with the Guemes Island community at large. Sadly, five of them have already died before seeing their work implemented.

Five years have passed since the Board of Commissioners adopted the Guemes Island Subarea Plan. As you are aware, the Subarea Plan is designed to protect the environment, natural resources, and rural character of a unique and clearly confined section of Skagit County as we all deal with the sometimes competing issues of growth and land use.

Guemes Island is an island. We have unique transportation issues. Guemes Island is the only area in the county that has been designated as a having a sole-source aquifer. We have limited water resources.

According to the US census of 2010, there is a full-time population of 667 residents living in 348 households on Guemes Island. There are 406 additional households that are occupied by part-time property owners. Under current zoning regulations, 830 more homes could be built on the island.

It is imperative that growth be managed to protect the natural resources and rural character of this fragile environment. Adoption of the Guemes Island Zoning Overlay and the Seawater Intrusion Policy are welcome additions to the 2016 Comprehensive Plan Update.

In 2006, 188 islanders gathered at the end of a three-day Sustainable Design Assessment Team visit sponsored by the American Institute of Architects Center for Communities by Design. The roundtable sessions, which were attended by islanders and county representatives alike, were designed to help islanders plan for a sustainable future. What the community of diverse individuals with diverse opinions discovered was a common vision that has been articulated in the Subarea Plan.

Please adopt the GIPAC recommendations for this update; they reflect decades of widespread community discussions, planning, and support.

Sincerely,

Edith M. Walden

Edith Walden

The American Institute of Architects

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Guemes Island, WA Daily SDAT Update

Friday, June 23, 2006
Contributed by: Marj Charlier

GUEMES ISLAND – It was a beautiful early summer night on this island far north in Puget Sound. Yet, instead of paddling out in boats to view the sunset or share a beer on the porch of the general store with friends, 188 of the 800 island residents crowded into the small community hall here, many standing along the walls as the chairs filled up.

The topic, however, wasn't the kind of sudden catastrophe that generally brings communities together in meeting halls, but a concern about the distant future – about the sustainability of their island.

The meeting marked the end of a three-day Sustainable Design Assessment Team (SDAT) visit sponsored by the AIA's Center for Communities by Design. The SDAT method is a charrette process designed to help communities committed to planning for a sustainable future by recruiting out-of-town (usually out-of-state), objective experts in architecture, landscape architecture, ecology, economics, transportation and other specialties who volunteer to help communities assess their choices and issues and clear a trail toward formulating strategies and solutions.

"This process isn't about losing – losing rights or independence or anything. It's about gaining – gaining as an individual, as neighbors, as a community," Erica Gees, team leader for the community planning process, told the gathered community.

The Guemes Island Planning Advisory Committee (GIPAC) applied for the SDAT grant and assistance as a way to accelerate the development of its sub-area plan, a part of the Skagit County Comprehensive plan.

The charrette, held mainly at Guemes Island's Community Center June 20th through 22nd, included a community tour for the visiting SDAT team and two public meetings along with a day and a half of roundtable meetings where about 60 cornmunity stakeholders discussed five areas of interest: transportation; alternative energy; rural character; water supply and quality; and wildlife, shoreline and open space as well as other issues that were on their mind.
(See the SDAT section for more details about the process and the program.)

Following the roundtable discussions, the AIA team members prepared findings and recommendations, including some short-term strategies and long-term policies that could help:
- preserve the island's rural character,
- conserve water and protect the quality of the island's sole source aquifer,
- resolve transportation disagreements,
- protect wildlife and shoreline habitat, and
- increase island energy independence.

They presented their findings at the Thursday night meeting.

"The keys to this process are that we bring the objectivity of outside experts that form a multidisciplinary team and we

focus on public participation," said Ann Livingston, Director, Community by Design, a program of the AIA. SDAT team leader Gees, an associate with Kuhn Riddle Architects, Amherst, Mass., stressed that focusing on sustainability, and its three components – the economy, the environment and social/cultural traditions and equity – provided a basis for all community stakeholders to participate in the process by providing a lens through which differing points of view can find common ground.

Illustrating that point was the attendance at the charrette by Skagit County officials, including Don Munks, County Commissioner; Jeanne King and Corrine Storey, of the Skagit County Health Department; Steve Cox, Guemes Ferry Manager; and Jeroldine Hallberg, Betsy Stephensen and Ann Bylin, of the County Planning Department. The relationship between the county and island residents has been severely strained of late over such things as expanded ferry schedules and the interest in self-determination expressed by some island residents.

"It's gratifying that these county officials saw enough merit in the SDAT process and care enough about the island's future to put aside their differences and attend the meetings, " said Gees. After the first few meetings in Guemes, county officials asked Gees if the AIA could help coordinate charrettes in other sub-areas in the county to help resolve log-jams in their planning processes as well, she said. "I'm proud that we have brought a process to the table that will allow the county and its residents to get back together and work out their conflicts."

Guemes Island had been warned that it would be some time before the county would have the funds to address Guemes Island's issues, but the community felt development pressures on the eight-square-mile island with incredible coastline views were calling for a more immediate response. The process also brought out the best in the local community, local leaders of the island effort said.

"I was overwhelmed by the public response," said Roz Glazer, vice chairman of GIPAC. "People seemed to understand the importance of sustainability. They had been thinking about the issues, they came prepared to contribute to the discussion, and they did so in meaningful, constructive and creative ways." She gives credit to the process, but also to the sensitivity and attitude of the AIA team members. "I think their presence gave this community comfort so that they didn't feel threatened, even though the experts came from more than 50 miles away," Glazer said, poking a little fun at the natural provincialism of her adopted, somewhat isolated island.

Throughout the SDAT meetings, community participants commented that the sessions were far more valuable in examining the bases of their prejudices, wishes and positions than they had expected. "One of the things that really impressed me was how many different voices and people, who often disagree, were brought together in this process," said Edith Walden, an orchard owner on Guemes Island, a local business woman, and one of the roundtable participants. "Having all their input has made us all aware that we do have a community with a common vision. It's made us all energized and hopeful about our future."

The results from the SDAT meetings will be used to help develop the island's sub-area plan, ensuring the AIA and the community that the proposals don't sit on a shelf and gather dust. Among the recommendations in their final reports were:

Energy independence: Guemes Island has numerous solar, wind and other alternative energy producers among its 800 permanent residents, and the island should work to foster continued experimentation and leadership in energy independence, said David Stecher, a mechanical engineer with The Ecological Construction Laboratory of Urbana, Illinois, a non-profit organization that designs highly energy-efficient and healthy houses. In addition, the island should work with state and county officials to promote use of subsidized weatherization programs, investigate building a small scale biodiesel plant for island vehicles, and start a Guemes Energy Efficiency Club (GEEC) to help promote energy efficiency and alternative energy production among officials, businesses and residents. Before the three-day work session had ended, the members of the energy roundtable had agreed to set up the club, and many volunteered to work on it.

Transportation: Jack Werner, a consultant from the Climate Institute of Washington, D.C., recommended that islanders improve their communications with city of Anacortes and county officials and to help resolve disputes over their ferry service, which provides the only public access to the island. His roundtable developed several recommendations for the county for capital improvements to parking, landings, waiting areas and bicycle storage at the ferry terminals. They also developed suggestions for fare structures that would encourage car-free travel, recommended that islanders improve road signage to reduce speeding and improve safety for bicycle traffic, expand biodiesel production on the island to fuel the ferry and other vehicles, develop photovoltaic charging stations for electric vehicles and explore the possibility of producing ethanol on the island.

Rural character: To preserve the unpretentiousness and small scale of island buildings, Walt Cudnohufsky, a landscape architect from western Massachusetts, encouraged the islanders to establish voluntary architectural guidelines for new construction to help newcomers understand the island's culture and style. "Islanders embrace values reflecting a strong sense of community, neighborliness, an unhurried pace of life, respect for privacy, awareness of history, stewardship for land and shore, creativity and an independent spirit," said Cudnohufsky. He also suggested that islanders seek to cluster development and to initiate an island open space fund in order to keep the rural open space even as new residents come to the island. Islanders can help preserve their rural culture and introduce newcomers to it by developing an inclusive welcome-wagon program and by offering more tours of gardens, art, forestlands, wildlife and innovative energy projects.

Water resources: Warren Flint, an ecologist and sustainability consultant with Five E's Unlimited in Seattle, commented that the island should work to collect important data of the overall island water supply to develop a scientifically based water budget for the Guemes Island system that is understandable by all stakeholders. He also recommended that the island conduct education and awareness regarding Island water resources, encourage cooperation between Washington Department of Ecology and Skagit Country Planning and Health Departments, insure that all wells and homes are metered for water use, limit impervious surfaces on the island to enhance recharge capacity and minimize freshwater runoff, encourage clustered domestic waste water treatment facilities for failed septic systems, encourage home water conservation, increase shoreline setbacks, and reduce the allowable building size to lot size ratio.

Wildlife, shorelines and open space: About 70% of the island's shoreline properties are owned by senior citizens, and in light of their imminent transfer, islanders should find ways to protect or acquire them for wildlife and public access, said Glenn Acomb, a landscape architect from the University of Florida. In addition, he recommended that islanders protect or restore interior island lands that are important to open space, wildlife or for the island's aquifer by working with state wildlife agencies and educating the public about the importance of protection.

In addition to the specific interest area recommendations, team leader Gees suggested that the community forge new relationships with neighboring communities to help resolve issues, and to continue to work with the Samish tribe, whose interests in their former tribal lands are in line with the interest on the part of the island to protect its rural character, island ecology and cultural heritage.

Over the next year, the SDAT team members and AIA staff will be available to the community leadership for consultation, and a couple of team members will revisit the community after a year to provide additional feedback and expertise as needed.

Thursday, June 22, 2006
Contributed by: Marj Charlier

GUEMES ISLAND – Wednesday (June 21) was the longest day of the year north of the equator. But for the residents and AIA volunteers and staff working on a plan for Guemes Island's future, it was barely long enough. Residents of this far-northwestern island of Washington State began showing up at 7:30 in the morning to get started working with the AIA's Sustainable Design Assessment Team (SDAT). Pads and pens in hand, they drifted into the Guemes Community Center in khakis, dress pants, long peasant skirts, Birkenstocks, cowboy boots and loafers, their dress visibly representing the diversity and various professions and stages of life of the residents of the island.

"I am always impressed with how many people really get involved" in the community, said Joost Businger, chairman of the Guemes Island Planning Advisory Committee (GIPAC).

This motivated and eclectic group of islanders, brought together by the AIA's Center for Communities by Design's SDAT Program and (GIPAC), all shared one goal: the hope that their work will provide much of the philosophy, direction and tools that will eventually be adopted as the island's land-use plan by Skagit County. (See the SDAT section for more details about the process and the program.)

"What's very, very clear is that your main concern is controlling growth that's compromising your rural future," said Erica Gees, team leader for the Guemes Island SDAT, as she sent the volunteers home Tuesday night, following a public meeting that allowed all citizens to come and express their hopes and concerns for their 8-square-mile island. Harvesting that passion for the island's rural nature set the agenda for Wednesday, as about 60 of the island's 800 residents in five roundtables began sifting through their opinions and preferences, and sorting them into a concrete set of proposals for preserving their island way of life.

The roundtables and a sample of their discussions so far are:

Renewable Energy: In applying for the SDAT grant, GIPAC told the AIA that one of its highest priorities was reducing dependency on off-island power and fuel supplies. Even before gasoline hit $3 a gallon around the country, Guemes Islanders were feeling the pinch of high energy costs. There is no natural gas on the island, propane for furnaces has to be trucked across to the island by ferry and there is no public transportation. Further, many Guemes Island residents were already experimenting with alternative energy schemes, including photovoltaic electricity production, passive solar construction and wind generation. Conversations overheard in the local general store's bar are as likely to be about alternative energy technologies as about the latest TV shows.

The energy roundtable decided to focus its work on three major areas: producing its own fuel and energy such as biodiesel, wind and solar; encouraging conservation; and educating key players in real estate and building professions and regulatory agencies. "We're leaning toward volunteering ourselves as a permanent group to create a culture of energy efficiency on Guemes Island," one of the resident volunteers reported. "Being aware of our island culture, we decided it would be better to assist, not mandate or regulate."

The group was led by David Stecher, a mechanical engineer with The Ecological Construction Laboratory of Urbana, Illinois, a non-profit organization that designs highly energy-efficient and healthy houses.

Rural Character: With only 800 permanent residents, Guemes Island is a place where people feel part of a community and value public participation, but where they live – largely in small homes – at the end of quiet lanes among large open spaces and forests. They value their personal safety and they value thelack of pretension in their modest homes, and they worry that rising real estate values and the recent appearance of huge second homes on the island's coasts are going to change the rural nature of the island.

Focusing at one point on the iconic expression of this change – the big house –SDAT team members Walt Cudnohufsky asked the roundtable to discuss what they feared they wouldlose if more big houses were built on the island. "Why are big houses such a problem?" he asked. That led the group to discuss how to mitigate those losses: How to ensure homes fit into the rural context, how to reduce wasteful consumption, how to ensure economic and social diversity in the population, and how to buffer the impact ofrising real estate values on property taxes.

The group also identified special places on the island that helped the community retain its rural character, and discussed what can be done immediately to be sure that the rural values of those places are protected, given the

potential that their ownership or use will change.

Cudnohufsky is a landscape architect from western Massachusetts, who participated as a local volunteer in an SDAT project in western Massachusetts before agreeing to volunteer as an SDAT team member on Guemes Island.

Transportation: The transportation group decided to organize its discussions in three areas – the ferry (which provides the only access to the island), the state of the island's roads, and alternative modes of transportation. Much of the group's work focused on the issues of ferry schedules and costs, as the island's residents have long believed that the limited ferry hours were a major tool in limiting the island's growth. Through the SDAT process, however, the participants also began to recognize how the ferry served as an informal community "place" where neighbors meet neighbors and news is exchanged.

At the end of the working sessions, the group adopted a vision statement calling for a "comprehensive public transport system, seamlessly integrated with the county-wide transit system" that is "affordable, sustainable and fueled by alternative energy sources," involves education, public participation and incentives for alternative modes of transportation, and "promotes the island's rural character."

Water resources: One of the most limited resources on Guemes Island is the water supply, of which about 90% comes from the sole source aquifer that underlies the island. Already, seawater intrusion into the aquifer has required some areas of the island to rely on expensive reverse osmosis water treatment. And, in defense, many homeowners have turned to rainwater collection for both potable and non-potable water uses.

The roundtable led by R. Warren Flint, an ecologist and sustainability consultant with Five E's Unlimited in Seattle, approached the task of identifying alternatives for regulating water use and providing alternative water supply by imagining seven potential futures for the island's development, from catastrophic water failure to stopping growth entirely. Identifying water supply and quality problems associated with each of those potential scenarios provided the team an opportunity to also suggest potential solutions to each of those problems, resulting in a list of potential actions for final consideration.

Open Space, Wildlife and Shoreline: According to GIPAC, one of the highly valued characteristics of the island for residents is the wildlife, marine life and open space of the island. However, as the roundtable focusing on this area quickly discovered, island residents had a variety of perspectives on wildlife. Further, the island appeared to have no pressing critical wildlife issues, such as endangered species.

Therefore, rather than focus on specific wildlife species or regulations, SDAT team member Glenn Acomb, a landscape architect from the University of Florida, asked the group to identify a list of potential actions that the island could take to protect open space and important wildlife areas into the future. In addition, the group discussed how to better protect shoreline quality, and how to enlist shoreline property owner assistance in protecting that property. The group also discussed recommendations for reaching out to large landowners with information about open space preserves, land trusts and low-impact development, and reaching out to homeowners with information about encouraging diversity in backyard flora and fauna.

On Thursday, following the roundtable sessions, the SDAT team will take the collected wisdom of the community and form a proposal for action. Thursday night, the experts will present their proposal at a public meeting, where they will receive feedback for a final report that will be completed following the visit.

Wednesday, June 21, 2006
Contributed by: Marj Charlier

Residents of tiny Guemes Island, located off the tip of a peninsula on Puget Sound, are worried.

For decades, they trusted that their quiet, crime-free rural lifestyle was unassailable. Far enough from Seattle to avoid being a bedroom community, they felt safely isolated from big-city pressures. Although it takes only seven minutes to reach the island from Anacortes, WA, by ferry, the service's limited hours of operation provided a far more effective buffer from strangers and traffic than its short trip would suggest. And since the mid-60s, when islanders successfully beat back a proposal to build a huge aluminum smelter on their 8-square-mile oasis, large-scale and industrial economic development has been pretty much off the table as a topic of discussion.

But enter the era of retiring baby-boomers and their oversized second homes, and suddenly, things have started to change. Small cabins on tiny parcels along the beaches have been scraped and replaced with lot-sized mansions. The county has decided to increase the ferry service to Anacortes to 10 p.m. (from 6 p.m.) on weekday nights, threatening to bring more strangers on the island past dark. More people and more houses are threatening to overtax the island's water supply; its aquifer isn't recharging fast enough to keep saltwater from seeping into some coastline wells and water systems.

"It wasn't any one certain thing" that sparked the island to action, says Joost Businger, chairman of the Guemes Island Planning Advisory Committee (GIPAC). "But there's always been a feeling that the island wanted to have some say about our own development."

Anxious to take control of its future, in 1991, the island elected the GIPAC to make recommendations for the island's land-use plan. But, tough as things look for island residents, they aren't bad enough to make it one of the highest priority planning areas for Skagit County Commissioners. More than ten years later, the island is still waiting for action on its sub-area plan. And recently, the county informed the island that it won't have the funds to support the island's "sub-area planning" process as part of the county's new comprehensive land-use plan for the foreseeable future.

"We weren't really surprised at that," says Businger. "We just said, 'Well, we'll do the work ourselves.'"

Starting this week, a team of architects, landscape architects, water specialists, energy engineers and transportation experts from around the U.S. is helping the island do just that. The experts were pulled together as a Sustainable Design Assessment Team (SDAT), a program of the AIA's Center for Communities by Design, after Guemes Island was chosen as one of eight communities to receive technical assistance under the SDAT program in 2006. Through its charrette process, the SDAT team will help community residents and their planning committee create the blueprint that the island will then recommend as its sub-area plan to the county's commissioners. (For more information on the SDAT program, and for a list of the 2006 communities, see the SDAT section.)

"You are doing something that is rare in taking it upon yourselves to be involved in determining what you want your island to look like," said Commissioner Don Monk at the introductory meeting of the team and the community Tuesday (6/20) in the island's community hall. "Guemes Island has moved itself up in list and could become the model for sub-area planning in the county."

The SDAT program is based on the principle that environmental, social, cultural and economic systems are interconnected and are all essential to ensuring sustainability, said Erica Gees, team leader for the Guemes Island project, AIA past president from Western Massachusetts and the president elect for AIA New England, at the opening meeting. In making sustainability the goal, disparate groups with widely varied opinions can discover common ground and find agreement where they thought they could only disagree. "By everyone looking through the same pair of glasses and focusing on sustainability, we have found that we can bring people together and build a solid consensus," she told the gathering of
some 100 community residents. "People can see that there are benefits for everyone in creating sustainable

communities."

As a community that already understands sustainability issues, Guemes Island was a natural choice for the SDAT process, said Ann Livingston, Director, Center for Communities by Design. "In order to be approved for an SDAT a community has to have a basic understanding of sustainability and its economic, social, cultural and environmental components as well as the long-term time frame; the Guemes Island residents clearly understand the concept of sustainability and have been working passionately to become more sustainable."

Guemes Island illustrated that in grand fashion Tuesday morning – in grand fashion for a rural island with only 800 residents. In a three-hour tour of the island put together for the assembled AIA experts, dozens of community residents showed off their energy efficient homes (some totally "off the grid"), rain-harvesting projects, sustainable ranches, successful small artists and other businesses, and open space and wetland preserves. Set among the natural resources of a beautiful coastline, abundant wildlife, and tall trees, and blessed with a bright sunny day, the tour did its job.

"You have a wonderful island here," said team leader Gees. "You have entrepreneurship, creativity and problem solving."

Over the three days of the charrette process, the SDAT team and the community will work to hone its recommendations on six areas of concern identified by the island's planning committee:

- Water resources and the limited, sole-source aquifer
- Transportation issues and alternatives
- Preserving the sense of community and rural character
- Reducing energy consumption and dependency on non-renewable energy sources
- Maintaining the predominant scale of homes on the island, and
- Maintaining the quality and quantity of wildlife habitat in harmony with residential development.

The group started its work Tuesday afternoon, splitting into five roundtables of community members and experts who agreed to discuss these key issues and identify the community's goals and priorities. A public meeting on Tuesday night allowed all residents to come and express their opinions about their island's future and the SDAT process. At the meeting, the experts promised to develop recommendations to help the community form their draft sub-area plan. But at the same time, the experts warned residents that they needed to do some work as well, defining exactly why they are concerned about growth and their future. "Why are you concerned about big houses" being built on the island? asked Walt Cudnohufsky, a landscape architect from Massachusetts. "You can't stay on an emotional level."

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From: Jack Wallace
To: PDS comments
Subject: Comprehensive Plan 2016 Update - comments from Jack R. Wallace - 11163 Blue Heron Rd, Bow, WA 98232
Date: Monday, April 11, 2016 3:00:05 PM

The following comments on the Comprehensive Plan 2016 Update are submitted by Jack R. Wallace, 11163 Blue Heron Rd, Bow, WA 98232

The Burlington Edison Multi Modal Pathway (Tiger Trail) should be removed from the comprehensive plan because it is incompatible with Agricultural activities, because it would create undue safety risks, and because the right of way that the County seeks to acquire no longer exists.

1. A multimodal trail or path along Chuckanut Drive would be incompatible with agriculture because farmers use chemicals and utilize heavy equipment in fields along the highway. Having pedestrians next to the fields would hamper farmers' ability to use their land for crop production. Much of the equipment used in fields is dangerous and has blind spots difficult for the operator to monitor. Some grain crops grow high enough to conceal children or even adults who might stray off of the path and into the field where they could be run over by equipment. Buffers and fences would have to be installed and maintained to protect users of the trail and even then complaints and heightened exposure to liability for farmers, the State and the County would be unavoidable. Taking a wide enough area to safeguard pedestrian users would be expensive and would consumer vast amounts of prime farmland. The buffers would create areas that would be overgrown with weeds and other vegetation that would harbor pests and noxious weeds that would further exacerbate the impact on agriculture. Additional herbicides and pesticides would have to be used to control pests. Pedestrians might wander into fields and be injured by chemicals. Some equipment such as irrigation reels are automatic and are unattended. Such equipment would be dangerous to trail users who might cross into fields.
2. Farmers are subject to various food safety laws and regulations that prohibit trespassers and animals near or in fields used for the production of food. To invite the public with dogs and other animals into or near fields would create hazards that would have to be treated as such under HACCP plans imposed on farmers by retailers and other customers and by the federal government under FSMA. Growers of food products such as berries and potatoes are subject to annual audit and each field is inspected for signs of human or animal activity that might create risks. Adjacent land uses and activities are evaluated for their potential to create food safety risks. Litter, urine and animal and human feces are considered risks. Farmers are required to post no trespassing signs and maintain buffers between fields and incompatible adjacent land uses. Such a trail would make food production much more difficult and it would take additional land out of production due to food safety regulations and restrictions. Food safety rules require a restroom facility with handwashing station every ¼ mile or within a 5 min walk for employees (to prevent employees from urinating or defecating in the field and to allow washing). Such precautions would likely be required of pedestrians along the field and would necessitate 28 bathrooms along the 7 mile path to meet the same level for the public.
3. The right of way that PSE claims to have acquired (that originated from the interurban railroad) no longer exists. The right or way was cleared of brush by farmers shortly after the

railroad ceased operating in 1930. In most cases no rent has been paid by farmers occupying the land. Consequently, the land passed to the farmers along the path decades ago by virtue of the doctrine of adverse possession.

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APR 14 2016

Skagit County Planning Commission
1800 Continental Place
Mount Vernon, Wa. 98273

April 13, 2016

RE: Comments on Skagit County Comprehensive Plan 2016 Update, Transportation Technical Appendix. (clean version)

A longer public comment period is much needed for this comp plan update.

Pages 8,51,66,244 -- Skagit County UGA Open Space Concept Plan Sept. 2009. (UGA OSCPlan) - Please remove all language and references to the UGA OSCPlan in this Comp Plan Update.
This Concept Plan is not a legal binding plan and must not be included in this comp plan update or be referenced.
UGA Open Spaces for recreational use should be within or adjacent NOT BETWEEN UGA's. These trails must not be extended through our working agricultural farm lands. By putting trails into our rural areas will only encourage demand for residential development and cause food security concerns for our farmers. Rural trails have secluded areas that are only hiding places for undesireables night and day time.

Pages 20 - 22 -- Envision 2060 - Envision 2060 has not been legally adopted as a countywide plan. Please remove all language referencing Envision 2060 from this Comp Plan update.

Skagit County Comp Plan Update - Transportation Technical Appendix-
Exhibit 26 on pages 58-60 (pages attached). Transportation Improvement Program -- Our comments address the 11 projects listed under Non-motorized heading each without a ID number. These 11 non-motorized projects are required to go through a public participation process spelled out

in this comp plan 2016 update on page 251 in order to be included on TIP. (page 251 attached). That has not happened. Please remove these 11 projects from this Comp Plan update. These projects should be put through the same public participation process that all the other projects on this TIP list went through last fall.

Encourage the Planning Commission to support adding the following language in **bold** to policy 8A-7.3 page 262 of the Skagit County Comp Plan 2016 Update. (page 262 attached)
Goal 8A-7 Freight and Economic Development;

policy 8A-7.3 Encourage the enhancement and expansion of freight rail service to and from economic activity centers **with priority given to the return of the Sedro Woolley to Concrete rail service to revitalize east county's economic recovery.**

Added language to policy 8A-7.3 helps support a very much needed economic recovery for east county.

Thank you for considering our comments.

Skagit County Cattlemen's
Mike Ware President
5988 Fruitdale Rd.
Sedro Woolley Wa. 98284
360-856-4140

ID	Project	Location	Description	Project Cost	Year
29	Peterson Road	Bayview Ridge neighborhood to Higgins Airport Way	Improve to urban standards	$3,853,763	2019-20
30	River Bend Road Improvements	West of Burlington	Repair and raise roadway	$850,000	2017-18
37	South Shore Road	Guemes Island	Stabilize roadway	$75,000	2017
39	South Skagit Highway Milepost 4.0	MP 4.0	Stabilize roadway	$300,000	2017-18
	Safety				
9	Dodge Valley Road Barrier Protection	Chilberg Rd to Best Rd	Install new guardrail at various locations to improve safety	$400,000	2016
28	Old Highway 99 North Illumination	Morton Rd Vicinity	Install lighting to improve safety along approximately half-mile of Old Hwy 99	$166,000	2016
	Non-Motorized				
5	Centennial Trail	Big Rock to Clear Lake	Construct pedestrian/bicycle trail	$2,030,000	2016-17
	Bicycle Route 5 (Coast Millennium Trail)	Southern County line to Bayview State Park	A north / south multimodal transportation corridor from the Southern County Line north to Bay View State Park which passes through the Town of La Conner and Bay View utilizing County roads and trails. The projects would include paved shoulder widening, trail improvements, and signing along the corridor.	$7,000,000	2022-2036
	North Fork Bridge	North Fork Bridge	Improvements to the bridge to increase driver awareness and bicyclist safety; located on Bicycle Route 5 (Coast Millennium Trail). The project would install rider activated flashing beacons and signs warning motorist of bicycles on the bridge.	$7,000	2022-2036
	Bicycle Route 14	Mount Vernon to Mclean Pock Park	A east / west multimodal transportation corridor from Mount Vernon to the McLean Pocket Park and Bicycle Route 5 (Coast Millennium Trail) utilizing McLean Road. The project would include shoulder maintenance and widening where needed with the addition of signing.	$100,000	2022-2036

ID	Project	Location	Description	Project Cost	Year
	McLean Pocket Park	Best Road and McLean Road	A rest stop with amenities for the bicycle/pedestrian community positioned at the intersection of Best Road and McLean Road and centrally located between Skagit County's major destinations. This project park would include bicycle racks, picnic area, toilets, and informational signing of bicycle routes and trails in the area.	$300,000	2022-2036
	Bayview Ridge Spur	City of Burlington to Bay View Ridge	An alternative parallel multimodal transportation corridor to USBR 10 that connects the City of Burlington to Bay View Ridge and Bicycle Route 5 (Coast Millennium Trail). This project would construct a multi-use trail connecting to other existing and planned routes and trails.	$3,780,000	2022-2036
	Swinomish Indian Tribal Community Safe Routes	Swinomish Indian Tribal Community to La Conner and La Conner Schools	Improvements to Tribal, Town, and County roads and sidewalks from the Swinomish Indian Tribal Community to La Conner and La Conner Schools to increase bicyclist and pedestrian safety for residents and students. This project would make pedestrian and bicycle improvements to the existing road system that include flashing crosswalks, bicycle lanes, signing, and pavement markings.	$800,000	2022-2036
	Burlington to Edison Multi Modal Pathway (Tiger Trail)	City of Burlington to the Town of Edison	A separated non-motorized trail adjacent to State Route 11 connecting the City of Burlington to the Town of Edison and Bicycle Route 5 (Coast Millennium Trail). This project acquire right-of-way/easement adjacent to SR 11 for a separated multi-use trail, connecting the Allen, Blanchard, Bow, Edison area to the City of Burlington and other planned bicycle routes and trails.	$8,900,000	2022-2036

ID	Project	Location	Description	Project Cost	Year
	Avon Multimodal Cutoff	SR 20 east of Burlington	An east / west multimodal corridor from City of Burlington to the intersection of Higgins Airport Way and State Route 20, utilizing unopened county right-of-way. This project would construct a trail from the Pulver Road area to Higgins Airport Way connection to the Port trail system utilizing existing County owned right-of-way.	$3,000,000	2022-2036
	Guemes Ferry Trail	Ferry terminal to Edens Rd	A separated trail located on Guemes Island, adjacent to Guemes Island Road, that connects the ferry landing to Schoolhouse Park. This project would construct a multi-use trail connecting the Ferry Terminal to the Community Center and Park near Edens Road. Where possible it would utilize adjacent right-of-way along Guemes Island Road.	$1,400,000	2022-2036
	US Bicycle Route 13 (Cascade Trail)	State Route 9 and County Roads	A north / south multimodal transportation corridor from the southern County Line to the northern County Line adjacent or parallel to State Route 9 and County roads. The path would consist of a 10 paved trail and a grass shoulder for equestrian use.	$26,610,000	2022-2036
	US Bicycle Route 10 (Cascade Trail)	State Route 20	An east / west multimodal transportation corridor from Fidalgo Island to the Town of Concrete utilizing State Route 20, City and County roads and trails. This would include shoulder widening where necessary and trail construction and/or improvements	$20,000,000	2022-2036
	Studies				
35	Skagit River Bridge Modification and I-5 Protection Project	Transportation facilities near Skagit River	Study potential modifications of transportation facilities to improve flood control along Skagit River	$1,199,700	2016
38	South Skagit Highway Realignment	S Skagit Hwy at Mill Creek	Study to identify ways to improve fish habitat and bridge maintenance at Mill Creek, including possible realignment	$18,500,000	2017-18

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

road projects primarily based on physical deficiencies, the Level of Service based transportation needs are used to select potential projects. The transportation financial plan is used to produce a financially feasible six-year plan. Thus, the Transportation Element provides a framework for use in making transportation investment decisions.

Pursuant to RCW 36.81.121, the Six-Year Transportation Improvement Plan (TIP) is updated annually. The Public Works Department produces a draft TIP that includes projects retained from the previous year, plus any additions or deletions, and a short description of each project. The department holds an informational meeting for the public to comment on the draft plan, and sends the draft documents to the Planning Commission for review, public hearing, and recommendation.

Then the Board of County Commissioners holds its own a public hearing on the proposed TIP, and adopts the TIP prior to adoption of the County budget. The TIP is then sent to the Skagit Council of Governments (SCOG) where regionally significant or federally funded project are compiled from the TIPs of other municipalities into the Regional TIP (RTIP). SCOG sends the RTIP to the Washington State Department of Transportation where it is combined into the State TIP.

GMA Mandate

Development of this chapter was guided in particular by the following GMA Planning Goal:

- *Encourage efficient multi-modal transportation systems that are based on regional priorities and coordinated with County and city Comprehensive Plans.*

This goal, taken in the context of the totality of the thirteen GMA Planning Goals, led to the following Countywide Planning Policies (CPPs) that provide specific guidance to the analysis and policies developed in this chapter:

- *Multi-purpose transportation routes and facilities shall be designed to accommodate present and future traffic volumes (CPP 3.1).*

1 Contents
2 Land Use
3 Rural
4 Natural Resource Lands
5 Environment
6 Shoreline
7 Housing
8 Transportation
9 Utilities
10 Capital Facilities
11 Economic Development
12 Implementation
Subareas
Appendices

Transportation System (FGTS). In conjunction with the state, designate portions of the road system as truck routes.

policy 8A-7.2 Provide roads structurally adequate to handle anticipated commercial traffic demand, particularly on the FGTS.

policy 8A-7.3 Encourage the enhancement and expansion of freight rail service to and from economic activity centers.

policy 8A-7.4 Encourage improvements to air transportation facilities consistent with the ports of Skagit County and the state Aviation System Plan. Improve road and transit linkages to airport facilities.

Goal 8A-8 Tourism and Recreation

Support the promotion of tourism, recreation, and special events through the County transportation system.

policy 8A-8.1 Involve affected jurisdictions in the planning and design of transportation projects that affect major tourism, park, and recreation facilities.

policy 8A-8.2 Coordinate management of the transportation system during special events with the responsible program organizations, while minimizing the disruption of normal economic operations including agriculture, forestry, and other natural resource industries.

policy 8A-8.3 Encourage the state to consider high-season traffic demand on SR 20 in East Skagit County whenever the state studies the need for improvements.

From: puppylove183@juno.com
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Saturday, March 19, 2016 2:39:36 PM

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19 March 2016
Public Comment

On 11 March 2016, I received a flier in the mail regarding planning and development in and around Sedro-Woolley. The 11 acres south of Sedro-Woolley that mentioned future use of that city owned parcel as a drainage facility. As my property is located just north and adjoins this area, this greatly concerns me. Over ten years ago there was a change made that increased the amount of rain drainage into a slough/ditch area that runs approximately 50 feet south of my home. Since then, the area never really dries out. During heavy rain events, the ditch quickly fills and overflows onto my property. The Skagit River south of Sedro-Woolley, unlike the Mt. Vernon area is deeper and narrower. At the Mt. Vernon gage location, 28 feet is flood level. Typically according to the Sedro-Woolley U.S.G.S. water level gage, the river leaves its banks and starts to overflow at 37 feet just east of the Riverside Park's boat launch. This eventually floods the ball field area and goes into a culvert and into the ditch/slough area. When this area is already awash in the drainage water and a flood occurs, this compounds and increases the potential impact. Since I bought the property in 1990, my daylight basement has taken on significant water six times from Skagit Flooding. It has not occurred from just runoff drainage. About 3 years ago, there was a cleaning of this ditch area that really made a big difference. That following winter, there was only minor ditch/slough overflow. It could use cleaning and deepening again. Any action that may increase the water in the ditch/slough greatly concerns me. If the proposed plan mitigates or redirects the drainage, I would be supportive. I called and spoke with Mark Freiberger and John Coleman from Skagit County Planning and Sedro-Woolley Planning. Neither could give any concrete details on plans or impacts of any action at this point. This also concerns me. I also wonder if an Environmental Impact Statement has been completed? I believe that no action on land classification and status should be taken until a comprehensive detailed proposal and study of potential impacts can be accomplished. It is impossible to make a good decision or comment when the facts and details are yet unknown.

Sincerely,
Lawrence E. Warren
23888 Dunlop Ave.
Sedro-Woolley, WA 98284

"It is better to fail at something right than succeed at something wrong." Dr. Who
Su`ka Wicha`sa ~ Hothy` Iue` Wama`kaska
Virus Scanned Microsoft Security Essentials 2016

Odds n Trends
81 Perfectly Timed Photos...#59 Is Amazing!
http://thirdpartyoffers.juno.com/TGL3142/56edc6e79eb3746e77dbbst02vuc

RECEIVED
APR 06
SKAGIT COUNTY
PDS

C RAY WICKERT
11546 WICKERT LANE
BURLINGTON WA 98233

COMPREHENSIVE PLAN
2016 UPDATE

IT'S NOT CLEAR TO US HOW THIS WILL EFFECT THE OWNERS IN THE NEIGHBORHOOD AND THE VALUE OF OUR PROPERTIES. PLEASE ADVISE US. WHAT COSTS ARE WE GOING TO INCUR.

THE NEWSPAPER MAP SHOWED THE NEW BUILDING RIGHT UP AGAINST OUR EAST PROPERTYLINE. IF THIS IS THE CASE WE REQUEST THAT SKAGIT HOUSING AUTHORITY BUILD A 6' TALL FENCE ALONG OUR EAST PROPERTY LINE WHICH IS PART OF THE HOUSING AUTHORITY'S WEST LINE.

SINCERELY, Ray Wickert

The following comments were received during the written public comment period but were improperly submitted.

From:	Debra L. Nicholson
To:	Debra L. Nicholson
Subject:	FW: Bill Wooding/Lake Erie Trucking
Date:	Thursday, March 31, 2016 2:35:27 PM

From: Frank [mailto:jeretzky@msn.com]
Sent: Wednesday, March 23, 2016 6:29 PM
To: Linda Christensen
Subject: Bill Wooding/Lake Erie Trucking

My name is Frank Jeretzky and I live at 13664 Rosario Rd. in Anacortes. My property is directly across the street from the Wooding property, and I am writing in support of Mr. Wooding and his company. I understand he wants to continue his operation and even expand it. He has always been a good neighbor.

If you have any questions, please contact me at 360 – 293-5979.

Thank you,

Frank Jeretzky

Sent from Mail for Windows 10

From: mtsmark@comcast.net
To: PDS comments
Subject: Comprehensive Plan 2016 Update
Date: Thursday, April 14, 2016 3:07:58 PM

I am writing against the proposed New Section 14.16.360 Guemes Island Overlay to C-26 Guemes Island Subarea Plan. I believe the proposal could result in a Regulatory Taking by miniaturizing new construction on narrow lots and destroying property values for no useful purpose. The proposal fails to recognize that the average ground line and the minimum floor elevation may be quite different. This differential is common on most of the fully developed properties in Indian Village and West Beach on the west side of Guemes Island. Twelve foot sidewalls may not allow full height ceilings for 21 building lots in Indian Village and 53 lots in West Beach. Many of these lots have existing homes vulnerable to flooding and will need to be reconstructed with floors at higher elevations.

New Section 14.16.360 increases scale differential between new construction and existing large homes and reduces view windows in new homes. All existing homes on narrow lots in Indian Village exceed the requirements of the proposed limitations. About half the homes in Indian Village have floor levels meeting current standards. Most of these homes are two story. The remaining non-standard homes could only be reconstructed smaller than they are now to meet the proposed standards. Their view of Bellingham Channel would be reduced by limited view area on the west side of their homes. Their are no homes behind the homes on the flat beach in Indian Village.

The New Section 14.16.360 reduces design options to improve living spaces and appearance of reconstructed homes. The proposed variable height limit is especially restrictive on narrow fifty foot building lots such as about 18 properties in Indian Village. These lots would be limited to a 14 foot second floor room centered in the house. Load bearing walls for support of that room would eliminate open spaces such as great rooms on the first floor. No side gables would be allowed to allow roofs sloping toward the front. Roof slopes to promote downward water flow in high winds would be limited. All homes would be cookie cutter shaped into geometric boxes to eliminate originality or character.

The GIPAC proposed new requirements to benefit a few of their member homes in North Beach without concern about the mass majority of homes on Guemes Island. Or concern of their own community homes that may wish to more fully develop their properties, and block views of people behind them. Many communities had no input in the proposal and are not aware these changes are proposed. The senseless building proposals without the concern of others, make the proposed changes in water requirements questionable. As a Licensed Professional Civil Engineer (PE) I have read the Guemes Hydrology report from 1995 and I see no evidence that water use in Indian Village will have any impact on North Beach salt water intrusion. I believe new requirements should be from hard data and scientific analysis rather than isolated quotes in a biased paper. I believe communities can rely on County Professional Staff to only implement changes that are necessary for public benefit. These Professional Staff will base changes on thorough scientific analysis from professional experts that look at all impacts.

Please see the attached Issue Paper for more detail on building requirements and pictures.

Issue Paper – Comp Plan 2016 Update

New Section 14.16.360 Guemes Island Overlay – Indian Village

Executive Summary: The Indian Village Community is a beautiful community with outstanding views and water access. It has about 21 lots in a flat beach area. About 18 of those lots are only 50 feet in width. About half the homes meet current codes requiring floor elevations 3 to 5 feet above the ground line. The remaining beach homes are vulnerable to flooding. Twelve foot sidewalls will not allow full height ceilings above the floor height if the lower homes are reconstructed to current standards.

The proposed new Section 14.16.360 will take away good design standards and make small homes smaller when they are reconstructed on their narrow lots. Side gables will be eliminated allowing sloping roofs with overhang in the front. Second level rooms will be limited to 14-feet outside dimensions centered in the home. Load bearing walls on the first level will eliminate open concepts with great rooms. Roof heights will be limited below the new proposed 30-feet limiting roof slopes in a high wind area.

The new proposal increases scale differential in the Indian Village Community and reduces rooms with views in new construction. Property values will dive as potential buyers must choose between owning a home with potential flooding or reconstructing a smaller home even more out of scale from neighboring homes. The changes constitute a Regulatory Taking unless property owners are compensated for their loss in property values. The changes have no benefit in the Indian Village Community and the GIPAC has not shown benefit anywhere on Guemes Island. The proposal downgrades one of the most beautiful communities on Guemes Island with fantastic views, active sea life, and adequate clear water.

Issue 1: The proposed <u>New Section 14.16.360 Guemes Island Overlay</u> to the Guemes Island Subarea Plan targets communities like Indian Village by requiring restrictions that downsize existing homes. The maximum building heights that limit the sidewalls of new structures to 12 feet above the average grade at the side setback do not allow full height ceilings when the floor elevations must average 4-feet above the ground level. About 21 building lots on Indian Village community and 53 building lots on the West Beach community further south have minimum floor elevation requirements that are 3 to 5 feet higher than the existing grade. This discrepancy from the existing grade does not allow adequate building height to build full height ceilings at the required side setbacks. These restrictions may constitute a Regulatory Taking by reducing building options and property values for no logical reason.

Discussion: About 18 of the 21 homes on the flat area of Indian Village West Beach are on lots with only 50 feet of beach frontage. The lots are flat at the beach front for about 100 feet and then they slop upward for about 200 feet to an elevation of between 60 and 80 feet higher at

West Shore Road. About half of the 21 homes are built with a floor elevation of 3 to 5 feet above their average ground grade to meet minimum flood requirements. The remaining beachfront homes are vulnerable to flooding from a combination of high tides, low atmospheric pressure, and storms. After being flooded the majority of these home owners will likely pursue reconstruction with higher floor elevations. The proposed building requirements will severely downsize reconstructed homes and increase the scale differential between the reconstructed homes and larger existing homes at higher elevations. A 4-foot floor elevation with 12-foot sidewalls will not allow full height interior ceilings

The West Beach to the south enclosing Edens Road and Lervick Road has similar issues with about 21 of 53 homes having floor elevations to current building code standards. The remaining homes with lower floor levels will have similar issues to Indian Village West Beach except that most of the lots have more beach frontage. The larger lot width will increase options but also increase side setbacks with the 30% of the lot width for required side setbacks.

Issue 2: The proposed building restrictions do not achieve their objectives in the Indian Village community or perhaps other communities. They achieve the opposite effect in Indian Village and destroy attractive building options. The restrictions are especially restrictive in the narrow lots in Indian Village. They limit many good design options such as side gables to enable a sloping roof to the front; and open concepts with great rooms; and frontage area for rooms with view windows; and adequate sloped roofs to prevent high winds from blowing rain up hill and into roof vents. Homeowners would be forced to build to maximum dimensions so all new homes would have the exact same shape being dwarfed by existing structures. All new homes would look alike instead of having unique character. The building restrictions would require all new home to be smaller than all existing homes and increase scale differential. Homes in Indian Village would be forced to be narrow in front and long on the sides making more rooms with windows facing their nearby neighbors instead of the natural beautiful views of Bellingham Channel.

Discussion: The proposed building envelope prohibits good design alternatives on narrow lots that make homes more attractive and livable. Most people reconstructing their homes in Indian Village want an attractive but unique design maximizing western views and outdoor recreational areas.

The proposed standard sidewall height prohibits side gables that allow roofs to slope toward the house front. Side gables with roofs sloping toward the house front allow roof overhang in the front to provide cover from sun and rain for outdoor seating. Many Indian Village homes enjoy outdoor benches and chairs in front for the beautiful views of islands over Bellingham Channel.

Limited wall height at the side setbacks and sloping heights require any rooms at the second level such as a master bedroom to be built in the center of the house and at a 14-foot

maximum width outside dimensions. Second level rooms require load bearing walls on the first level. The rooms are built most efficiently above house corners where they can use two exterior walls as load bearing walls. When second level rooms are built in the center of the house load bearing walls break up the potential for open spaces on the first level. Open spaces provide options like great rooms that include living rooms, dining rooms, and kitchens. Great rooms are currently popular and are very efficient for providing a spacious environment.

The proposed sloping height limit will not even allow the proposed 30-foot maximum building height on a 50-foot lot. A second story room could not have a roof with adequate slope to prevent high winds from blowing rainwater up hill and into roof vents. Water in roof vents dampens insulation, causes ceiling leaks, and water damage that destroys house values.

Restrictions such as no side gables, second level rooms in the house center, and building height tend to make all new houses look alike. This similarity could make neighborhoods look more like some kind of low income housing project than a diverse community with unique character. People that take pride in their homes often want to have unique features that set their home apart from all the others. Making all the homes in a neighborhood look alike does not enhance the beauty of Guemes Island. Homeowner need design options to build the home of their dreams.

The building envelope tends to restrict the size of new homes but does nothing to the limit size of existing homes that are generally newer and larger. Since all lots on Indian Village have existing homes, the larger new homes will remain large and the smaller older homes will be size restricted creating more scale differential.

Both Indian Village and West Beach communities have about half larger homes with floor elevations meeting current standards. These are newer homes that will not likely be reconstructed for a long time. The older homes at lower elevations are more likely to be impacted by more restrictive building codes. Limiting their size keeps them under scaled in comparison the larger homes.

Recommendation: Scrap the new Section 14.16.360 until the GIPAC inventories the damage they are causing and notifies property owners of proposed action. They developed these standards to help in some unknown situations in a community without regard of the hardship they are causing other communities such as Indian Village. They have received only one comment (me against the proposal) from the Indian Village community. They state their goals as protecting views and preventing out of scale buildings. However, their regulations would cause the opposite effect in Indian Village and possibly other communities as well. In a quick survey in the last week 11 home owners on West Beaches did not know of any proposed action. Zero knew of proposed action. If the GIPAC members intend to represent the people, they need to solicit input from all communities on Guemes Island.

Typical Example - Madden Home: About 9 of 21 lots in the flat portion of the Indian Village neighborhood have homes vulnerable to flooding by a combination of high tides, low atmospheric pressure, and high winds. An additional two lots do not currently have beachfront homes (homes setback). If flooded, the reconstruction of the beachfront homes requires a higher main floor height to meet current building codes and prevent future flooding. The proposed building standards severely restrict the possibility of building a replacement home anywhere near the scale of other homes in the neighborhood.

The Madden house built in 1952 and expanded in 1976. It is vulnerable to flooding during a perfect storm with a main floor about 6 inches above the ground elevation. This mild winter high tides carried driftwood within 10 feet of the house. The lot has 50 feet of beach frontage. The property is flat easterly from the beach for about 100 feet and then slopes upward for about 200 feet to an elevation about 75 feet higher at West Shore Road. The building is a single story home with a second story master bedroom in a back corner of the home. The two homes to the north and the two houses to the south are two story homes.

The proposed standards would not allow this home to be raised 4-feet. The require a home and master bedroom more narrow with small interior rooms instead of the existing great room. The roof would have no overhang in front for weather protection. Potential buyers would lose interest facing flooding or a smaller out of scale home. The changes would not increase island beauty, livability, scale, or views. The would increase scale differential.

Pictures: The following pictures illustrate the issues that exist in the Indian Village neighborhood

Five homes in the Indian Village neighborhood with the Madden home being the third. It is completely out of scale and if it were reconstructed it would be much smaller if within the proposed envelope

Current building codes require the main floor at a higher elevation than the ground line. This home shows the typical stairs required to get to the main floor elevation with currently building codes.

The existing Madden Home. Building codes require a new floor height about a foot higher than the bottom of the windows. The building envelope requires the home to be more narrow, no second story master bedroom, no side gable providing front roof overhang, and more out of scale to the neighboring homes.

SKAGIT COUNTY
RECEIVED
MAR 15 2016
COMMISSIONERS

3/14/2016

To the County Commissioners:

I request that I be included in the Urban Growth Area of Sedro Woolley.
I would like you to please review it and determine it for the Future.
My property is 17 acres (1) property North of Bottomless Lake

7630 State Rte 9
Sedro Woolley, Wash 98284

William Jefferson Murphy

From:	Debra L. Nicholson
To:	Debra L. Nicholson
Subject:	FW: Andrea Xaver FW: Comprehensive Plan 2016 Update (See below for my name and address)
Date:	Friday, April 15, 2016 9:34:27 AM

-----Original Message-----
From: Andrea [mailto:dancer@fidalgo.net]
Sent: Thursday, April 14, 2016 4:21 PM
To: Pdscommnets@co.skagit.wa.us
Cc: 'Lisa Janicki'; 'KenDahlstedt'; 'Ron Wesen'; 'Andrea'
Subject: Comprehensive Plan 2016 Update (See below for my name and address)

April 14, 2016.

I support the comments, questions, and concerns which have been submitted by Friends of Skagit County (FOSC), via Ellen Bynum.

She did an outstanding job of reviewing this vast document and submitting time-consuming information that most people in Skagit County
would not have been able to do.

Thank you for your time and consideration.

Andrea Xaver
19814 State Route 9
Mount Vernon, WA 98274
(360-422-8922)

P.S. It said in the “How to Comment” area that a [my] name and address should be in the subject line (along with the proposal name).
This seems odd, to have all those things in the subject line, hence my comment In the subject line about where to find my name and address.

Cc: Skagit Co. Commissioners as an FYI