CITY OF CRAIG
PLANNING COMMISSION AGENDA

Meeting of February 7, 2018
7:00 p.m., Craig City Council Chambers

Roll Call
Sharilyn Zellhuber (chair), John Moots, Kevin McDonald, Barbara Stanley, Millie Schoonover

Approval of Minutes
1. Approval of minutes of January 11, 2017

Public Comment
1. Non-Agenda Items

Public Hearing and New Business
1. CUP 180207 – Resolution 577-18-PC, Operating a Retail Marijuana Establishment in a Commercial Zone, Jaquelin Weatherbee

Old Business
1. Craig Hazard Mitigation Plan Update

Adjourn

CITY OF CRAIG
PLANNING COMMISSION MINUTES
Meeting of January 11, 2018

Roll Call
Present were Sharilyn Zellhuber (chair), John Moots, Kevin McDonald, and Barbara Stanley. Millie Schoonover was absent excused.

Also present were Brian Templin, Jon Bolling, Jim See, Luke Decker, Anjuli Decker, Kit Kraft, John Wright, Bill Altland, Sarah Altland, Karl Demmert, Tammy Demmert, Tim O'Connor, Joyce Mason, JT Ratzat, Aaron Horner and Zack Porter.

Approval of Minutes

1. Approval of minutes of November 21, 2017. It was noted that the minutes did not reflect the discussion about the yellow cedar decline during the Craig Multi Hazard Mitigation Plan Kickoff discussion. Brian said that he would review the previous meeting and add that comment to the minutes. A motion was made and seconded to approve the minutes as amended.

MOTION TO APPROVE STANLEY/MOOTS APPROVED

Public Comment

Non-Agenda Items

1. Jim See commented that he wanted the planning commission to review the current parking requirements. He said that he felt that one parking space for each 1.5 bedrooms is insufficient. Brian told the commission that he would include the discussion on a future meeting agenda.

2. Bill Altland commented that there is currently no place in town that allows tent camping for the public. He said he would like it considered. Brian told the commission that he would include a discussion on the item on a future meeting agenda.

Public Hearing and New Business

1. CUP 881027 – Kingdom Hall of Jehovah's Witnesses (New Building). Brian reported that the Craig congretation of Jehovah's Witnesses planned to remove the current building and put up a new one. Brian said that they had a valid conditional use permit but felt it was prudent to put the item up for any discussion or comment. He said that he had notified the property owners within 300' of the building and had not received any written comments. JT Ratzat and Zack Porter were present to answer any questions. A question was asked about the footprint of the new building compared to the old one. Zack stated that the new building had a smaller footprint. Brian told the commission that if there were no comments that they felt required some action that the 1988 conditional use permit was still valid and that no action would be necessary. The commission took no action on the item.

2. CUP 180111 – Resolution 576-18-PC, Operating a Retail Marijuana Establishment in a Commercial Zone, Thee Treasure Chest LLC. Brian talked about the staff report that had been submitted on the issue. Brian said that Tammy Demmert and Kim Patotzka had submitted written comments which were included in the meeting packet and that Luke and Anjuli Decker had submitted written comments at the beginning of the meeting. Kit Kraft and John Wright were present to talk about their application and to answer questions.

   Barb Stanley asked where the entrance would be located. Kit talked about his background and said that the entrance would be on 9th Street. Sharilyn asked about the possibility was of moving the entrance to Water Street. There was some discussion about the preffered location of the entrance and the possibility of constructing a breezeway or something to funnel traffic to the Water Street side even if the entrance were located on 9th Street. Tammy Demmert was concerned about the impact to her business on 9th Street. Jim See commented that a breezeway or tunnel would likely cause problems for law enforcement.Jim also commented that he felt that the entrance on 9th Street would reduce exposure to minors. There was some additional discussion about where the entrance was located.

   Sharilyn asked where deliveries would be made. Kit and John said that deliveries would be made discreetly. John also commented that deliveries were part of the store checklist maintained by the Alcolhol and Marijuana Control Office (AMCO).

   There was some discussion about signage. The applicants said that signage would be discreet, likely located on the building near the intersection of 9th and Water Streets and that their sign designs would be submitted to the AMCO with their complete application to the state.

   Sharilyn asked how many people would be allowed in the store at a time. The applicants said that there would generally not be more than two people in the store at a time and that they legally had to discourage loitering. They also said that they do not intend to apply for an on-site consumption permit. The applicant said they did not have any indication of what the daily traffic would be like.

   John Moots asked if there would be exterior video cameras. The applicants talked about the state requirements for cameras and for retaining video footage.

   Jim See asked Kit how long he had been renting rooms at the building and if he had filed his quarterly sales tax. Kit said he believed he had been filing his quarterlies and planned to meet with Joyce the day after the meeting.

   Barb Stanley asked about days and hours of operation. Kit responded that he anticipated operating six days a week between the hours of 0 am and 8 pm. Anjuli

Decker said she had submitted written comments but wanted to see the hours set. Jon Bolling suggested that the commission could set the maximum hours in the conditional use permit.

Sarah Altland said parking on 9th Street was a problem in general and would like to see the city improve signage on the street. Luke Decker said that he had submitted written comments but was primarily concerned about parking as well. Luke suggested that parking on 9th Street be by permit only.

There was some additional discussion about the location of the entrance and a tunnel. Tammy asked again for the entrance to be on Water Street but for privacy fencing at a minimum. Barb said she had some concerns about kids and traffic on Water Street and felt that the 9th Street entrance was better. John Moots said that he had issues with a tunnel or breezeway and that there were merits to the 9th Street entrance.

John Moots also suggested that the commission put a deadline on the conditional use permit applicant to get their state license and start operations.

After all of the discussion the planning commission added four additional conditions to the permit:

Condition 5 would read "that the conditional use permit shall expire eighteen (18) months after the date of issue if the permittee has not been issued a marijuana establishment license by the State of Alaska".

Condition 6 would read "that the conditional use permit shall expire twelve (12) months after the date of issue of the marijuana establishment license by the State of Alaska if the business is not operational".

Condition 7 would read "that the permittee shall provide privacy screening from the southwest corner of the building extending to the westerly property line a minimum of six (6) feet in height".

Condition 8 would read "the establishment shall not be open to the public earlier than 10:00 am or open to the public later than 8:00 pm".

Condition 9 (previously condition 5) would read "that this conditional use permit is voidable by the City of Craig, at its sole discretion, if the applicant is unable to meet the above conditions".

A motion was made and seconded to approve PC Resolution 576-18-PC as amended.

MOTION TO APPROVE STANLEY/MCDONALD APPROVED

Old Business

1. Craig Comprehensive Plan Update – Final Review. Brian reported that the comprehensive plan update had been put out for public comment shortly after the November 21, 2017 meeting. He said that no comments had been submitted. Sharilyn asked if anyone wanted to make comments on the comprehensive plan update. There were no additional comments fromt the public or the planning commission. A motion was made and seconded to forward the Craig Comprehensive Plan update to the Craig City Council for consideration and approval.

MOTION TO APPROVE	STANLEY/MOOTS	APPROVED

Adjourn

A motion was made and seconded to adjourn the meeting.

MOTION TO ADJOURN	MCDONALD/ZELLHUBER	APPROVED

_____ _____

Chairman Sharilyn Zellhuber ATTEST: Brian Templin

CITY OF CRAIG
PLANNING COMMISSION
Staff Report
January 31, 2018

Applicant:	Jaquelin Weatherbee (dba Cannabis 49 LLC)
Requested Action:	Conditional Use Permit – Operation of a Marijuana Retail Establishment in the commercial zone
Location:	Lot 4B, Block 26, USS 1430 (500 Water Street)
Lot Size:	3,600 SF
Zoning:	Commercial
Surrounding Uses:	North: Commercial West: Commercial South: ROW/Commercial East: Commercial

Analysis

Jaquelin Weatherbee (dba Cannabis 49 LLC) has applied to the City of Craig planning commission for a conditional use permit operate a marijuana retail establishment in the commercial zone, located at 500 Water Street (Lot 4B, Block 26, USS 1430). Ms. Weatherbee intends to convert a portion of the existing building at that location to marijuana retail space (with the entrance to the shop opening onto Water Street). The applicant will be required to complete all licensing requirements as set forth by the State of Alaska, Marijuana Control Board.

In 2015 and 2016 a number of municipal ordinances were passed by the Craig City Council regarding commercial marijuana in Craig.

1. Ordinance 664 prohibits public consumption of marijuana in the Craig city limits.
2. Ordinance 669 amended title 5 of the Craig Municipal Code to create city business license requirements for marijuana establishments. This ordinance also limited the number of licensed retail establishments to two within the city limits. At present there have been no licenses for retail marijuana establishments approved. It is possible that there will be multiple applications for conditional use permits, potentially exceeding the number of allowable establishments. At this point in the process the planning commission should consider all conditional use permit applications that are submitted, even if the number of approved conditional use permits exceeds the two establishment limit. This will allow all applicants to go through the state licensing process. Approval of the conditional use permit does not guarantee completion of the licensing process with the state. If more than two conditional use permits are approved and more than two licenses go through the state

process the city will remind the Alaska Marijuana Control Board that they may only approve two licenses. This will be done during the city's comment period of the state license application.

3. Ordinance 678 exercised the city's local option under Alaska Statute to prohibit certain types of marijuana licenses. Under state statutes all license types are allowed unless local jurisdictions exercise this local option. This ordinance prohibits commercial marijuana cultivation, product manufacturing, and testing within the Craig city limits. Ordinance 678 did not prohibit commercial marijuana retail establishments in Craig.
4. Ordinance 682 amended title 18 of the Craig Municipal Code to include licensed retail marijuana establishments as a conditional use in commercial and industrial zones with the exception of marine industrial property along Hamilton Drive. This amendment also listed marijuana establishments as prohibited in all other zones.

Marijuana establishments in Alaska must be located at least 500 feet from certain types of uses. I have reviewed the proposed location against that list of uses and the subject property is 597' from the nearest excluded property along the shortest pedestrian route, exceeding the required exclusion zone.

As noted above there is a limit of two retail establishments in Craig (Ordinance 669). The planning commission may approve more than two conditional use permits if there are more than two applicants. The approved conditional use permit does not guarantee that an applicant will complete (or even start) the state licensing process. The approved permit also does not guarantee that the applicant will have their state license approved. The city (along with the public) has an opportunity to comment or object to license applications through the state licensing process. It is staff's intent to make comments to the Marijuana Control Board for each license application that there is a limit of two licenses that can be issued. If there are multiple conditional use permit applications and state license applications it is conceivable that a conditional use permit might be issued to an applicant but the city ultimately objects to issuance of the state license or advises the Marijuana Control Board on the grounds that there is a limit of two licensed establishments.

As of the date of this staff report there was one written comment submitted. That comment is attached along with a copy of the conditional use permit application and drawings.

Per 18.06.002 of the LDC, the following criteria shall be met before a conditional use permit may be issued:

1. That the proposal is consistent with the Craig Comprehensive Plan, the Craig Municipal Code, and other applicable ordinances.
2. That the proposed use is conditionally permitted in the zone.
3. That the proposed use is compatible with other existing or proposed uses in the area affected by the proposal.
4. That the proposed use would not create noise, odor, smoke, dust, or other objectionable pollutants creating impacts on surrounding areas.

5. That the proposed use would not affect the health and safety of persons or property.
6. That the location, size, design and operating characteristics will mitigate conflicting uses.
7. That unsightliness, building height, or structural incompatibility would not significantly affect surrounding areas or the designated viewshed.
8. That the proposal would not have a significant detrimental effect on property values in the area.
9. That all utilities required by the proposed use are adequate or will be made adequate by the applicant at no additional expense to the city and will not interfere with utility capacity to serve other areas of the city.
10. That access is adequate to serve the additional volume and type of traffic generated and would not threaten health and safety by significantly altering traffic volumes and patterns.
11. That adequate off-street parking is provided. (See Chapter 18.14, Parking.)
12. That the proposed use would not degrade land, air, water, or habitat quality.
13. That the proposed use will not interfere with the efficiency of, the planned expansion of, or access to water dependent or water related uses unless: 1) there is a documented public need for the proposed use, 2) no alternative site, and 3) the public good will be served better by the proposed use than by the water dependent or water related use.
14. That other relevant objections made evident at the public hearing are addressed.
15. That the proposed use and development do not disturb trees or shrubs which are designated for habitat or resource protection; wind, noise, sediment, or pollution buffers; recreation or open space; protection from natural hazards, watershed protection, or visual considerations unless a plan is approved which will mitigate potential adverse impacts.

Criteria 1-10, 12-13, and 15 appear to be met on the face of the application.

Criteria 11 requires adequate off street parking. There is limited off street parking at this location. The applicant's site plan shows a total of five off street parking spaces. The building currently contains five residential apartments and one additional unit that is rented out as commercial storage space. The proposed conditional use permit will replace one of the residential units. The building owner currently leases space adjacent to their building that provides a couple of additional parking spaces. The current parking does not appear to meet the required minimum number of spaces for the building. The commission should discuss parking. Staff advised the applicant that a joint use or shared parking agreement with a nearby commercial property owner would be beneficial to their application. The applicant said that she intended to contact adjacent property owners to see if a parking agreement was possible. It is important to note that under CMC 18.14 the parking requirement for the proposed use is the same requirement for the historical use (residential) of the property. The conditional use does not generate additional parking from what has been historically required of the property.

Criteria 14 may be met at the conclusion of the public hearing.

At the January 11, 2018 meeting the commission approved a conditional use permit for Kit Kraft (dba Thee Treasure Chest) for a marijuana retail dispensary on 9th Street. The commission added several conditions to that permit. I have included most of those conditions in the attached resolution for this permit as well.

Recommendation

That the planning commission adopt Resolution 577-18-PC granting a CUP to Jaquelin Weatherbee to operate a licensed marijuana retail establishment in a Commercial Zone, subject to the following conditions:

1. that the conditional use permit is not transferable to another individual or location;
2. that the applicant and property owner shall be current on all taxes, utility billing and other fees assessed by the City of Craig relating to the subject property and business operations;
3. that the applicant shall secure and maintain, in good standing, all licenses and permits required by the State of Alaska for operation of a marijuana establishment;
4. that the applicant shall comply with all provisions of Craig Municipal Code regarding placement and operation of a retail marijuana establishment;
5. that the conditional use permit shall expire eighteen (18) months after the date of issue if the permittee has not been issued a marijuana establishment license by the State of Alaska;
6. that the conditional use permit shall expire twelve (12) months after the date of issue of the marijuana establishment license by the State of Alaska if the business is not operational;
7. the establishment shall not be open to the public earlier than 10:00 am or open to the public later than 8:00 pm; and,
8. that this conditional use permit is voidable by the City of Craig, at its sole discretion, if the applicant is unable to meet the above conditions.

CITY USE ONLY

FILE NUMBER _____ FILE NAME _____

DATE RECEIVED _____ BY _____ FEE _____

HEARING DATE _____ NOTIFICATION DEADLINE _____

Conditional Use Permit Application

Applicant's Name Jaquelin P. Wetherbee

*Personal Address 111 Neptune Drive, P.O. Box 18077 Coffman Cove AK, 99918 Telephone No. 503-550-3854

Applicant's Representative (if applicable) _____

Address 500 Water Street Suite B Craig Ak Telephone No. _____

Subject Property Legal Description: Lot 4B Block/Tract 26 Survey Number 1430

Lot Size: 95.93 x 37.5 Subdivision Name _____

Township: Craig Range: _____

To help the planning commission gather facts about the proposed conditional use permit, please complete the following:

1. Describe in detail the conditional use requested: Cannabis dispensary Cannabis 49 LLC

2. Please attached a plot plan showing lot lines, building locations, parking spaces, and other relevant information. See Attached

3. What types of chemicals, processes, machinery or equipment will be used: None

4. Approximately how many days per week and how many hours per day will the proposed use operate? 7 Days a week, maximum allowable hours permissible by the city of Craig Ak.

5. What noise, odor, smoke, dust, or other pollutants could be caused by the proposal?
None, all items prepackaged or bulkpackaged

6. What types of uses are currently located within 300 feet of the exterior property boundaries?
21's Over Establishments; Moose Lodge, Craig Inn, Hill bar, and other commercial zones. Dockside, Little T's, Sunnahae Hotel, and over 300Ft JT Browns

7. What types and sizes of buildings, signs, storage and loading areas, screening, etc. are planned (size, height, type)? Existing Suite B, approximately 15x30 SqFT. 450'
Sign shall be flat on exterior, professional look with respect to all. 8Ft x 3Ft

8. What utilities are needed? WSEG, standard utilities, power, phone, internet

9. What roads will provide access? Water Street

10. What type and volume of traffic will be generated by the conditional use?
Pedestrian foot traffic, vehicle traffic

11. What are your parking needs and where will they be provided (indicate on the plot plan where parking is to be provided)? 2 parking spaces in front of existing proposed location for use, along with additional parking provided at a public parking lot near end of Water Street.

12. Will the proposed conditional use be compatible with the neighborhood in general? Why? Commercial zone with other 2½ over establishments, restaurants and hotels

The criteria by which a conditional use permit application is approved or denied is listed in Chapter 18.06.002.C K of the Craig Land Development Code.

A decision of the planning commission my be appealed to the city council within 30 days of the mailing of the notice of the commission's decision. Decisions of the city council may be appealed to Superior Court.

I (we) being duly sworn, depose and say that the foregoing statements and answers herein contained, and the information herewith submitted, are in all respects true and correct to the best of my knowledge and beliefs.

Dated this January day of 19, 2018.

Jacqueline P. Wetherbee
Applicant

Applicant

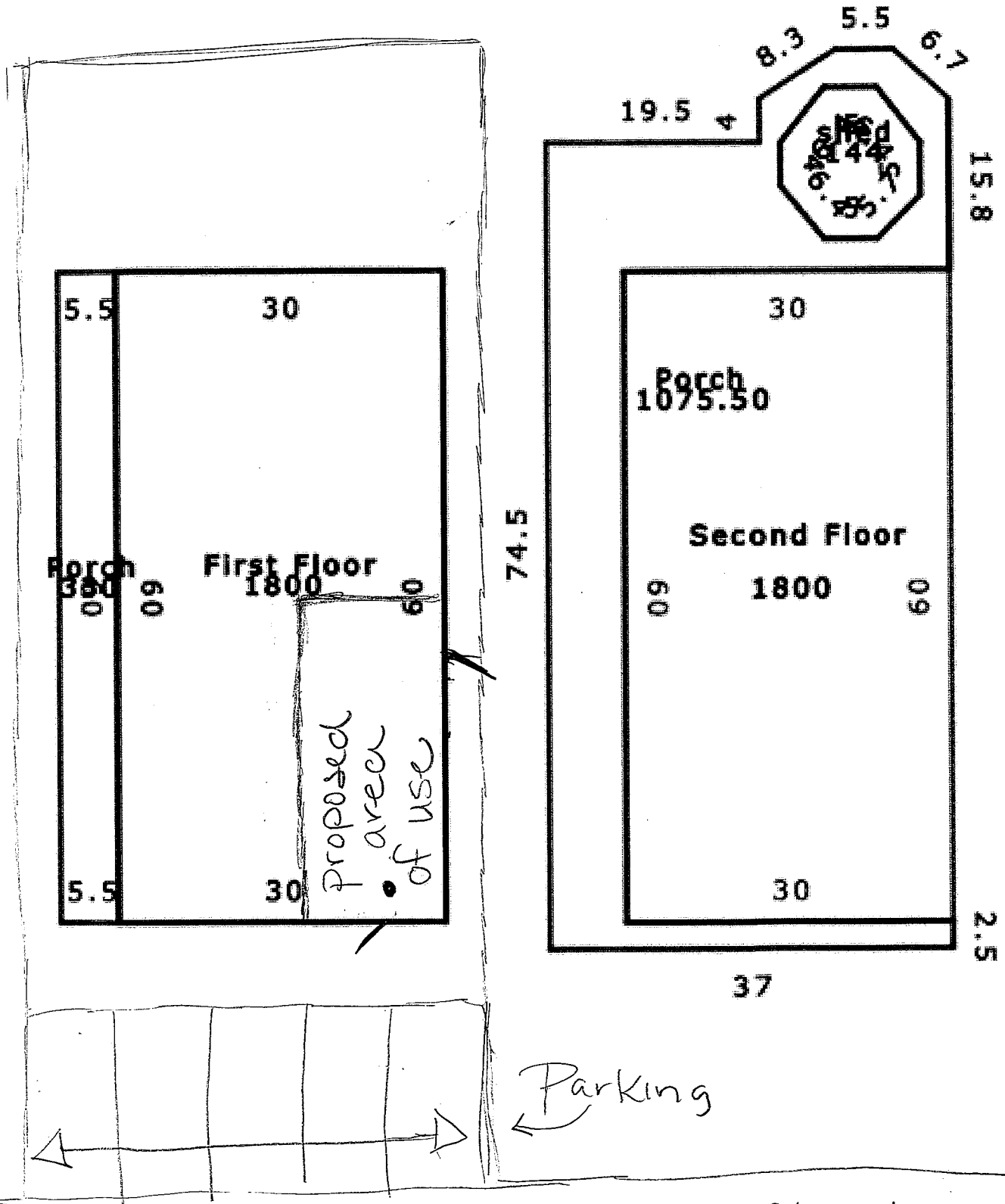
Authorization for Agency

If the applicant listed on this application is other than the sole deed holder of the property or properties upon which the temporary use will take place, complete the following authorization to act as agent:

I (we), the undersigned, hereby certify that as deed holder(s) of record of the property or properties described above, I (we) hereby authorize the person listed as the applicant on this application to act and appeal as agent with respect to this application.

Dated this January day of 19, 2018.

Signature(s) of deed holders:


5.5
8.3
6.7
19.5
15.8
5.5
30
Porch
1075.50
First Floor
1800
Second Floor
1800
74.5
09
60
09
60
Proposed area of use
5.5
30
30
30
2.5
37
Parking
Water Street

Brian Templin

From: Greg Mickelson [greg.m@aptalaska.com]
Sent: Friday, January 26, 2018 9:31 AM
To: Brian Templin
Subject: FW: city of craig notice
Attachments: notice.pdf

January 26, 2018

Planning & Zoning Commissioners:

On behalf of AP&T I'm responding to the CUP request from Ms. Weatherbee to operate a new business on Lot 4-B Block 26 UUU 1430. I object on the basis that there is inadequate parking for the multiple uses existing on that property today. I myself have experienced problems driving by this location numerous times with people blindly backing out into oncoming traffic. I certainly encourage new business opportunities in Craig but I don't believe this is an adequate location based on existing parking problems.

Thank you for your consideration.

Regards

Greg Mickelson

Greg Mickelson
Vice President of Power Operations
Alaska Power & Telephone Company
P.O. Box 149
Klawock, AK 99925
907-755-4822 Office Ext 4121
907-826-4826 Fax
907-965-1000 cell
e-mail greg.m@aptalaska.com

From: Anne Ritchey
Sent: Friday, January 26, 2018 8:36 AM
To: Greg Mickelson <greg.m@aptalaska.com>
Cc: Karen Hobart <karen.h@aptalaska.com>
Subject: FW: city of craig notice

From: Tracy Babauta
Sent: Friday, January 26, 2018 8:12 AM
To: Anne Ritchey <anne.r@aptalaska.com>
Subject: city of craig notice

Just an FYI

Tracy Babauta
Accounts Payable Manager
Alaska Power & Telephone Co.
(360) 385-1733 x106
(360) 385-5177 (fax)

CITY OF CRAIG
PLANNING COMMISSION
RESOLUTION 577-18-PC

GRANTING A CONDITIONAL USE PERMIT TO JAQUELIN WEATHERBEE TO OPERATE A LICENSED MARIJUANA RETAIL ESTABLISHMENT ON COMMERCIAL ZONED PROPERTY AT LOT 4B, BLOCK 26, USS 1430

WHEREAS, the Planning Commission held a public hearing on February 7, 2018; and,

WHEREAS, public notice was given in accordance with Section 18.06.002 of the Craig Land Development Code; and,

WHEREAS, the Planning Commission finds that the specific criteria of Section 18.06.002 of the Craig Land Development Code are met as follows, subject to the conditions listed below:

1. That the proposal is consistent with the Craig Comprehensive Plan, the Craig Municipal Code, and other applicable ordinances.
2. That the proposed use is conditionally permitted in the zone.
3. That the proposed use is compatible with other existing or proposed uses in the area affected by the proposal.
4. That the proposed use would not create noise, odor, smoke, dust, or other objectionable pollutants creating impacts on surrounding areas.
5. That the proposed use would not affect the health and safety of persons or property.
6. That the location, size, design and operating characteristics will mitigate conflicting uses.
7. That unsightliness, building height, or structural incompatibility would not significantly affect surrounding areas or the designated viewshed.
8. That the proposal would not have a significant detrimental effect on property values in the area.
9. That all utilities required by the proposed use are adequate or will be made adequate by the applicant at no additional expense to the city and will not interfere with utility capacity to serve other areas of the city.
10. That access is adequate to serve the additional volume and type of traffic generated and would not threaten health and safety by significantly altering traffic volumes and patterns.
11. That adequate off-street parking is provided.
12. That the proposed use would not degrade land, air, water, or habitat quality.
13. That the proposed use will not interfere with the efficiency of, the planned expansion of, or access to water dependent or water related uses unless: 1) there is a documented public need for the proposed use, 2) no alternative site, and 3) the public good will be served better by the proposed use than by the water dependent or water related use.

14. That other relevant objections made evident at the public hearing are addressed.
15. That the proposed use and development do not disturb trees or shrubs which are designated for habitat or resource protection; wind, noise, sediment, or pollution buffers; recreation or open space; protection from natural hazards, watershed protection, or visual considerations unless a plan is approved which will mitigate potential adverse impacts.

NOW, THEREFORE, BE IT RESOLVED that the Planning Commission grants Jaquelin Weatherbee a conditional use permit to operate a licensed marijuana retail establishment in a Commercial Zone, located at 500 Water Street (Lot 4B, Block 26, USS 1430), subject to the following conditions:

1. that the conditional use permit is not transferable to another individual or location;
2. that the applicant and property owner shall be current on all taxes, utility billing and other fees assessed by the City of Craig relating to the subject property and business operations;
3. that the applicant shall secure and maintain, in good standing, all licenses and permits required by the State of Alaska for operation of a marijuana establishment;
4. that the applicant shall comply with all provisions of Craig Municipal Code regarding placement and operation of a retail marijuana establishment;
5. that the conditional use permit shall expire eighteen (18) months after the date of issue if the permittee has not been issued a marijuana establishment license by the State of Alaska;
6. that the conditional use permit shall expire twelve (12) months after the date of issue of the marijuana establishment license by the State of Alaska if the business is not operational;
7. the establishment shall not be open to the public earlier than 10:00 am or open to the public later than 8:00 pm; and,
8. that this conditional use permit is voidable by the City of Craig, at its sole discretion, if the applicant is unable to meet the above conditions.

Approved this 7th day of February, 2018

_____ _____

Chairman Sharilyn Zellhuber Brian Templin, City Planner

CITY OF CRAIG
MEMORANDUM

To: Craig Planning Commission
From: Brian Templin, City Planner
Date: January 31, 2018
RE: Craig Multi Hazard Mitigation Plan

On November 21, 2017 Patrick LeMay from LeMay Engineering made a presentation to the planning commission kicking off the public process for updating the city's hazard mitigation plan.

LeMay Engineering has completed the draft update of the plan and it has been advertised to the public since January 5th for comment with public comments scheduled for February 7th.

I have reviewed the plan update and have the following comments:
Planner Comments
180105 Draft of Craig Multi Hazard Mitigation Plan

1. Page ii– Replace Greg Dahl with Don Pierce.
2. Page ii – Sharilyn Zellhuber should be listed as chairman, not John Moots.
3. Page viii – Change Be it further should be changed to read "Be it further resolved, that the Craig Planning Commission will submit the draft Multi-Hazard Mitigation Plan to the Craig City Council for final adoption.
4. Page 2 – Planning Team:
    a. Change Jon Boiling to Jon Bolling
    b. Add "City Administrator" as title for Jon Bolling
    c. Add "Craig Public Works" as title for Dave Nelson
    d. Change Hans Huort to Hans Hjort
    e. Change title for Sharilyn to "Chair"
    f. Delete Sharilyn Zellhuber's email address
    g. Change title for John Moots to "Member"
5. Page 3 – *Emergency Response Plan*, Replace "Southern Southeast Local Emergency Planning Committee" with "City of Craig"
6. Page 8, last paragraph – change to read "The City noted that they have the best participation rate on gaining feedback from their residents through electronic surveys with notices included in water/sewer bills that are mailed to residents. Once a year in March, a notice of a natural hazard survey will be included in the sewer/water bill. An electronic survey will be provided and the survey data will be compiled and included in the annual report, and considered during future plan updates. See Appendix E for survey.
7. Page 9, If 2017 population data is available before completion of the plan the updated data should be shown.

8. Page 10, delete (adminclerk@craigak.com) from City of Craig contact information.
9. Page 11, the number of vacant units seems very high compared to the vacancy rate. Please check those numbers.
10. Page 11, the population chart shows "0" population for 1880 – 1910. I don't believe this is true. If no population data is available please remove these years from the chart.
11. Page 11, please add ", fish processors" after "buying station" in the last paragraph.
12. Page 12, paragraph 2, delete the last sentence. IFA no longer provides scheduled service to the north end.
13. Page 12, paragraph 5, please delete "Coffman Cove" from the first sentence.
14. Page 16, State Resources, second paragraph, while www.ak-prepared.com still works I think the more current url is www.ready.alaska.gov. Please replace.
15. Pages 17 – 19, I found several of the resources cited to be not currently available or broken links. Please double check all data on these pages and confirm that they are current.
16. Page 30, several facilities are mislabeled or misidentified. Please coordinate with City Planner to make corrections.
17. Page 33 Vulnerability, second paragraph, change second sentence to note that new public structures are built above the BFE.
18. Page 36, first paragraph, third sentence, change Cty to city
19. Page 37, second paragraph, Is the comment about 10-20' wave height correct? This number looks high and appears to discount the nature of even a 3-5 foot runup.
20. Page 43, the January 2018 event should be included in this discussion.
21. Page 44, Project T-5, please replace "Twitter feed" with "various social media outlets and emergency notification systems"
22. Page 48, Project GF-1, I don't agree with the 2017 update. I would likely say that "Plant back up generators were installed in 2005/2006 and are maintained by the City of Craig. This project is also tied to earthquake and high wind (severe weather) projects."
23. Page 51, second paragraph, second line, change Prince Wales to Prince of Wales
24. Page 55, third paragraph says that there was a quake on January 5, 2015, I think that this is referring to the January 5, 2013 quake.
25. Page 57, Project E-8, change Taylor to Tyler throughout the paragraph.
26. Page 80, G/F-3 – landslide zones have not been mapped

There have been no written comments submitted by the public. If any comments are submitted before the public hearing I will give them to the commission at that meeting.

The planning commission should review the plan and make any additional comments. After all comments have been made and after the public hearing on February 7th the plan should be forwarded to the Craig City Council for final adoption.

Jennifer LeMay will be at the meeting on February 7th to address any questions that the commission has.

Recommendation: After hearing any public testimony the planning commission should direct staff to work with LeMay Engineering to incorporate all comments and forward the final draft to the Craig City Council for approval.

City of Craig, Alaska

Multi-Hazard Mitigation Plan

Prepared by:
The City of Craig

LeMay Engineering & Consulting, Inc.

January 2018

Acknowledgements

City Council
Tim O'Connor, Mayor
Michael Douville
Dave Creighton
Greg Dahl
Julie McDonald
Jan Trojan
Jim See

Craig Planning and Zoning Commission
John Moots, Chairman
Millie Schoonover
Sharilyn Zellhuber
Barbara Stanley
Kevin McDonald

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Phone: (907) 350-6061
Email: jlemay@lemayengineering.com
audra@lemayengineering.com

Technical Assistance
Brent Nichols, CFM, DHS&EM State Hazard Mitigation Officer

Photography
Brian Templin, January 2004
Eileen Bechtol, May 2008

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Acronyms

AAC	Alaska Administrative Code
AEIC	Alaska Earthquake Information Center
AEIS	Alaska Economic Information System
BFE	Base Flood Elevation (100-year flood)
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CCMP	Craig Coastal Management Plan
DCCED	Department of Commerce, Community and Economic Development
DCRA	(DCCED) Division of Community and Regional Affairs
DEC	(Alaska) Department of Environmental Conservation
DHS&EM	(Alaska) Division of Homeland Security and Emergency Management
DGGS	(Alaska) Division of Geological and Geophysical Surveys
DNR	(Alaska) Department of Natural Resource
DOT&PF	(Alaska) Department of Transportation & Public Facilities
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
Federal DHS	Federal Department of Homeland Security
FEMA	Federal Emergency Management Agency
HMP	Hazard Mitigation Plan
HMPG	Hazard Mitigation Planning Grant
LEPC	Local Emergency Planning Committee
MHMP	Multi-Hazard Mitigation Plan
MSL	Mean Sea Level
NFIP	National Flood Insurance Program
NPS	National Park Service
NOAA	National Oceanographic and Atmospheric Administration
NWS	National Weather Service
PDM	Pre-Disaster Mitigation Grant
SSLEPC	Southern Southeast Local Emergency Planning Committee
UAF	University of Alaska, Fairbanks
USCOE	United States Army Corps of Engineers
USFS	United States Forest Service
USGS	U.S. Geological Survey
WCATWC	West Coast and Alaska Tsunami Warning Center

Sample Resolution – Planning Commission

Planning Commission
Resolution #____

Adoption of the City of Craig
Multi-Hazards Mitigation Plan

Whereas, the City of Craig recognizes the threat that local natural hazards pose to people and property; and

Whereas, undertaking hazard mitigation projects before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

Whereas, an adopted Multi-Hazards Mitigation Plan is required as a condition of future grant funding for mitigation projects; and

Whereas, the Craig Multi-Hazards Mitigation Plan has been sent to the Alaska Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for their review and has received preapproval pending City Council approval.

Now, therefore, be it resolved, that the Craig Planning Commission*,* hereby recommends adoption of the City of Craig Multi-Hazards Mitigation Plan as an official plan; and

Be it further resolved, that the City of Craig will submit the adopted Multi-Hazards Mitigation Plan to the Alaska Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency officials for final approval.

Passed: _____
Date

_____
Planning Commission Chair

Sample Resolution – City Council

City of Craig, Alaska
Multi-Hazard Mitigation Plan Adoption Resolution
Resolution # _____

Adoption of the City of Craig
Multi-Hazard Mitigation Plan

Whereas, the City of Craig recognizes the threat that local natural hazards pose to people and property; and

Whereas, undertaking hazard mitigation projects before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

Whereas, an adopted Multi-Hazard Mitigation Plan is required as a condition of future grant funding for mitigation projects; and

Whereas, the Craig Multi-Hazard Mitigation Plan has been sent to the Alaska Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for their review and has received preapproval pending City Council approval.

Now, therefore, be it resolved, that the Craig City Council*,* hereby adopts the City of Craig Multi-Hazard Mitigation Plan as an official plan; and

Be it further resolved, that the City of Craig will submit the adopted Multi-Hazard Mitigation Plan to the Alaska Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency officials for final review and approval.

Passed: _____
Date

_____
Certifying Official

Chapter 1. Planning Process and Methodology

Introduction

Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Mitigation activities may be implemented prior to, during, or after an incident. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs (FEMA 386-8).

City of Craig, 2003
(Templin)

Mitigation Plan regulations are found in the Code of Federal Regulations at 44 CFR Part 201. This plan has been developed using the regulations to ensure compliance with federal criteria.

Federal regulations specify that local mitigation plans be designed to help jurisdictions identify specific actions to reduce loss of life and property from natural hazards. It is not intended to help jurisdictions establish procedure to respond to disasters or write an emergency operations plan. The goal of mitigation is to decrease the need for response as opposed to increasing response capability (FEMA 386-8).

The scope of this plan is natural hazards: tsunami, ground failure (landslides), earthquake, severe weather hazards, wildland fire, and climate change hazards.

The City of Craig Multi-Hazard Mitigation Plan (MHMP) includes information to assist the City government and residents with planning to avoid potential future disaster losses. The plan provides information on natural hazards that affect Craig, descriptions of past disasters, and lists projects that may help the community prevent disaster losses. This five-year update of the MHMP was developed to help the community of Craig make decisions regarding natural hazards that affect the City.

Plan Development

Location

The City of Craig is located on the west coast of Prince of Wales Island. Craig lies 56 air miles northwest of Ketchikan, 750 air miles north of Seattle, and 220 miles south of Juneau. It lies approximately 55.476390° North Latitude and -133.14833° West Longitude. Craig is located in the Ketchikan Recording District. The area encompasses 6.7 square miles of land and 2.7 square miles of water.

Project Staff

Craig City Planner, Brian Templin, was the project manager for the City. LeMay Engineering & Consulting, Inc. was hired to update the plan. The Planning and Zoning Commission was the lead public body that reviewed the plan.

Brent Nichols, CFM, of the Division of Homeland Security & Emergency Management (DHS&EM) provided technical assistance and reviewed the draft of this plan.

Table 1 identifies the planning team.

Table 1. Hazard Mitigation Planning Team

Name	Title	Organization	Phone
Jon Boiling		City of Craig	(907) 826-3275
David Nelson		City of Craig	(907) 826-3405
Hans Huort	Harbor Department	City of Craig	(907) 401-0995
RJ Ehy	Police	City of Craig	(907) 826-3330
Sharilyn Zellhuber	Member	City of Craig Planning and Zoning Commission	mszell@hotmail.com
John Moots	Chair	City of Craig Planning and Zoning Commission	(907) 826-2327
Millie Schoonover	Member	City of Craig Planning and Zoning Commission	(907) 461-8461

Kevin McDonald	Member	City of Craig Planning and Zoning Commission	(907) 826-5750
Barbara Stanley	Member	City of Craig Planning and Zoning Commission	(907) 826-2428
Brian Templin	City Planner	City of Craig	(907) 826-3275
Patrick LeMay, PE	Planner/Consultant	LeMay Engineering & Consulting, Inc.	(907) 250-9038
Jennifer LeMay, PE, PMP	Lead Planner/Consultant	LeMay Engineering & Consulting, Inc.	(907) 350-6061
Audra Lehman, PhD	Planner/Consultant	LeMay Engineering & Consulting, Inc.	(806) 778-9742
Brent Nichols, CFM	State Hazard Mitigation Officer	DHS&EM	(907) 428-7085

Plan Research

The plan was developed utilizing existing Craig plans and studies as well as outside information and research.

1. *Alaska All-Hazard Mitigation Plan*. Prepared by and for DHS&EM. October 2013.

2. *Alaska DHS&EM Disaster Cost Index*. Prepared by and for DHS&EM. 2016.

3. *Coastal Management Plan, Revised*. Prepared by City Planner Brian Templin for the City of Craig. 2007.

4. *Community Quota Entity (CQE) Program, Economic Analysis and Business Plan.* Prepared by Brian Templin, City Planner for the City of Craig, Alaska. July 2004.

5. Draft *Comprehensive Plan*. City of Craig. 2017.

6. *Craig Community Economic Development Strategy (CCEDS).* Annual Report. May 2012.

7. *Tribal Hazard Mitigation Plan,* Craig Tribal Association. 2016.

8. *Craig Municipal Code, Title 18, Land Development Code.*

9. *Craig Shelter Operations Plan*. Prepared by and for the City of Craig and Craig School District. October 2007.

10. *Division of Community and Regional Affairs (DCRA) Community Information*: https://www.commerce.alaska.gov/web/dcra/ResearchAnalysis.aspx

11. *Emergency Response Plan*. Prepared by the Southern Southeast Local Emergency Planning Committee. 2004 (updated in 2017).

12. *FEMA How to Guides:*

- Getting Started: Building Support For Mitigation Planning (FEMA 386-1)
- Multi-Hazard Mitigation Planning Guidance, July 1, 2008 (FEMA 386-8)
- Understanding Your Risks: Identifying Hazards And Estimating Losses (FEMA 386-2)
- Developing The Mitigation Plan: Identifying Mitigation Actions And Implementing Strategies (FEMA 386-3)
- Bringing the Plan to Life: Implementing the Hazard Mitigation Plan (FEMA 386-4)
- Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5)

13. *Tsunami Hazard Mapping of Alaska Coastal Communities*, Alaska GEO Survey News, Vol. 6, No. 2, Prepared by DGGS, June 2002.

14. *University of Alaska, Fairbanks, and Alaska Earthquake Information Center* (AEIC) website at: http://earthquake.alaska.edu/

15. West Coast and Alaska Tsunami Warning Center, NOAA, http://wcatwc.arh.noaa.gov/

General Hazard Planning Websites

American Planning Association:	http://www.planning.org
Association of State Floodplain Managers:	http://www.floods.org
Federal Emergency Management Agency:	http://www.fema.gov
Community Rating System:	http://www.fema.gov/national-flood-insurance-program-community-rating-system
Flood Mitigation Assistance Program:	https://www.fema.gov/flood-mitigation-assistance-grant-program
Hazard Mitigation Grant Program:	http://www.fema.gov/hazard-mitigation-grant-program
Individual Assistance Program:	http://www.fema.gov/individual-assistance-program-tools
Interim Final Rule:	https://www.fema.gov/media-library/assets/documents/4590

National Flood Insurance Program:	http://www.fema.gov/national-flood-insurance-program
Public Assistance Program:	http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/

Public Involvement

In Craig, collaboration and review are most beneficial when participants are provided with a draft document to review and critique. Rather than begin the process at the stakeholder level, it is necessary for a rough draft to be developed which can be used by the community to provide constructive feedback. LeMay Engineering & Consulting, Inc. developed an updated plan from the 2009 City of Craig MHMP.

Newsletter #1 was posted within the community of Craig inviting residents to attend the November 21, 2017 Planning and Zoning Commission meeting at Council Chambers. Patrick LeMay presented on the hazard mitigation planning process with respect to updating existing plans at this meeting. The Draft MHMP was available for a 30-day public review period beginning January 5, 2018. Newsletter #2 was posted within Craig announcing the availability of the Draft MHMP for public review and inviting community members to attend the February 7, 2018 Planning and Zoning Commission meeting to provide public comments on the Draft MHMP.

A copy of the Draft MHMP was available for public perusal at the City Hall, the Planning Department, the Fire Department, the Public Works Department, the City Library and online at the city website: http://www.craigak.com.

The Craig City Council will review and approve the plan after pre-approval by DHS&EM and FEMA.

Appendix A include public involvement documentation such as newsletters, jurisdiction commitment letters, meeting sign-in sheets, and comments.

Plan Implementation

The City of Craig Planning and Zoning Commission was the lead body for reviewing the plan and recommending approval to the Craig City Council. The Craig City Council will be responsible for adopting the Craig MHMP and all future updates. This governing body has the authority to promote sound public policy regarding hazards. The MHMP will be assimilated into other Craig plans and documents as they come up for review according to each plan's review schedule.

Table 2. Craig Plans

Document	Completed	Next Review
Craig Comprehensive Plan	2017 (Draft)	As needed
Craig Capital Improvement Priorities	Annually	Annually
Emergency Response Plan	2017	Ongoing
Revised Craig Coastal Management Plan	2007	Program was discontinued in 2011
Community Economic Development Strategy/Overall Economic Development Plan	2012	Annually

Monitoring, Evaluating and Updating the Plan

Section §201.6(c)(4)(i) of the mitigation planning regulation requires that the plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Monitoring the Plan

The Craig Planner or designee is responsible for monitoring the plan. On an annual basis, the Craig Planner will request a report from the agencies and departments responsible for implementing the mitigation projects in Chapter 5 of the plan. The compiled report will be provided to the Planning and Zoning Commission and City Council as information and noticed to the public. A report outlining all five years of the plan monitoring will be included in the plan update (see Appendix E).

Evaluating the Plan

The Craig Planner or designee will evaluate the plan during the five-year cycle of the plan. On an annual basis, concurrent with the report, above the evaluation should assess, among other things, whether:

- The goals and objectives address current and expected conditions.
- The nature, magnitude, and/or types of risks have changed.
- The current resources are appropriate for implementing the mitigation projects in Chapter 5.
- There are implementation problems, such as technical, political, legal or coordination issues with other agencies.
- The outcomes have occurred as expected (a demonstration of progress).
- The agencies and other partners participated as originally proposed.

Updating the Plan

The mitigation planning regulations at §201.6(d)(3) direct the update of Mitigation Plans.

Plans must be updated and resubmitted to FEMA for approval every five years in order to continue eligibility for FEMA hazard mitigation assistance programs. Plan updates must demonstrate that progress has been made in the past five years to fulfill commitments outlined in the previously approved plan. This involves a comprehensive review and update of each section of the plan and a discussion of the results of evaluation and monitoring activities described above. Plan updates may validate the information in the previously approved plan or may involve a major plan rewrite. A plan update may not be an annex to this plan; it must stand on its own as a complete and current plan.

The schedule for the plan update is to start the following tasks before the end of the five-year cycle:

- 3 years: Contact DHS&EM regarding plan update funding and procedure.
- 2.5 years: Contract for technical or professional services (if applicable).
- 2 years: Review of mitigation plan, develop planning process, and start the update.
- 6 months: State and FEMA review of plan. Update the plan, if necessary.
- 3 months: Finish the public review and approval process.

The following table lists the schedule for completion of these tasks:

Table 3. Continued Plan Development

Hazard	Status	Hazard Identification Completion Date	Vulnerability Assessment Completion Date
Tsunami	Completed	2009; Mapping completed 2015; Updated 2017	2009; 2017
Ground Failure	Completed	2009; 2017	2009; 2017
Earthquake	Completed	2009; 2017	2009; 2017
Severe Weather	Completed	2009; 2017	2009; 2017
Wildland Fire	Completed	2017	2017
Climate Change	Completed	2017	2017

Continued Public Involvement

The following methods will be used for continued public involvement.

A copy of the MHMP will be put online at the city website: http://www.craigak.com

Places where the hazard plan will be kept:

- City Website
- Police Department
- Planning Department
- Fire Department
- Public Works Department
- Library

The City noted that they have the best participation rate on gaining feedback from their residents through including surveys in water/sewer bills that are mailed to residents. Once a year in March, a natural hazard survey will be included with the water/sewer bill. Received surveys will be compiled in a folder and included in the annual report, and considered during future plan updates. See Appendix E for survey.

Chapter 2: Craig Community Profile and Capability Assessment

Community Overview

Current Population:	1,102 (2016 DCCED Population Estimate)
Pronunciation:	Craig
Incorporation Type:	1st Class City
Borough:	Unorganized
Census Area:	Prince of Wales

Map 1. Regional Map

Government

The City of Craig was incorporated in 1922 as a second-class city under the laws of the Territory of Alaska. It became a first-class city in 1973. The city functions under a mayor/council form of government with the day-to-day operations of the city overseen by a City Administrator. There are six council members and a mayor, all of whom are elected.

The following table provides local and regional contact information for Craig.

Table 4. Community Information

Community Information	Contact Information and Type
City of Craig	P.O. Box 725 Craig, AK 99921 Phone: (907) 826-3275 Fax: (907) 826-3278 E-Mail: cityclerk@craigak.com; adminclerk@craigak.com Web: http://www.craigak.com
Village Corporation:	Shaan-Seet, Incorporated P.O. Box 690 Craig, AK 99921 Phone: (907) 826-3251 Fax: (907) 826-3980 E-Mail: contact@shaanseet.com
Village Council: **(BIA-Recognized IRA Council/ Also a Public Law 93-638 tribal gov't contractor)**	Craig Tribal Association P.O. Box 828 Craig, AK 99921 Phone: (907) 826-3996 Fax: (907) 826-3997 E-Mail: tribal.admin@craigtribe.org
Regional Non-Profit:	Central Council Tlingit & Haida Indian Tribes of Alaska 320 West Wiloughby Ave., Suite 300 Juneau, AK 99801 Phone: (907) 586-1432 Fax: (907) 586-8970 Web: http://www.ccthita.org/ E-Mail: webmaster@ccthita.org

History

Tlingit and Haida village sites and fish camps historically occupied the Craig area. The City was named after Craig Miller who established a cold storage cannery facility. In 1923, Craig was incorporated as a second-class city. The 1920s brought an expansion

of the fishing industry. Tax revenues generated from the expanding fishing industry funded the construction of a school, streetlights, and other city improvements. During this period, Native immigration from Hydaburg and Klawock increased to Craig. In the 1940s, the Forest Service brought radio service connecting Craig to the “outside” world. Improved transportation, communication, and job opportunities stabilized the City’s declining population in the 1970s. In 1973, the city became incorporated as a first-class city. Craig is predominantly a fishing community.

Population

Approximately 27% of the population is Alaska Native or part Alaska Native. During the 2010 U.S. Census, total-housing units numbered 537, and vacant housing units numbered 67, over 50% of which are vacant due to seasonal use.

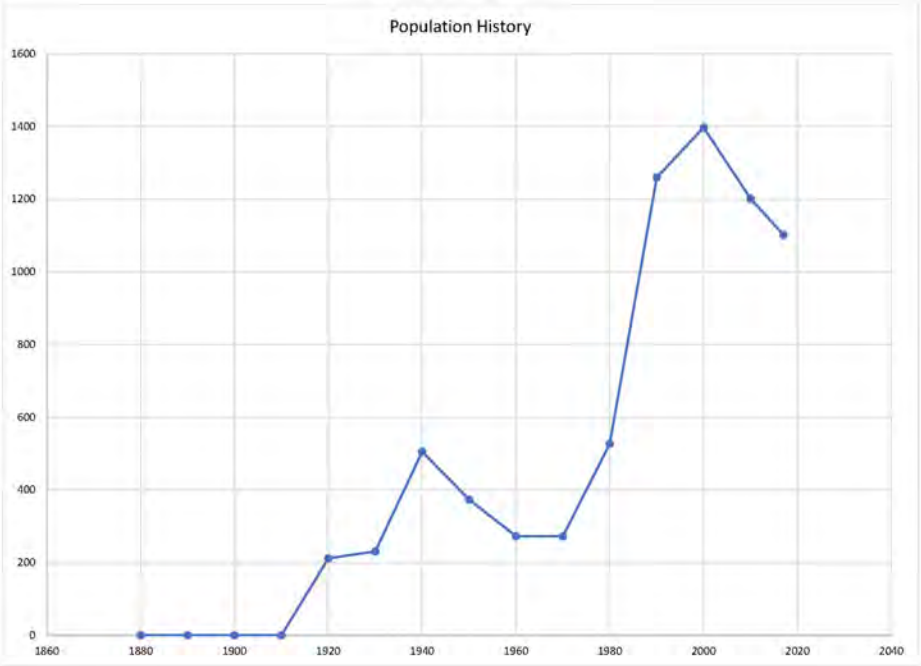


Table 5. Historical Population Data.

Economy

The economy in Craig is based on the fishing industry, logging support, and sawmill operations. A fish buying station and a cold storage plant are located in Craig. The number of residents that hold commercial fishing permits is 143. Craig has grown as a service and transportation center for the Prince of Wales Island communities. Shaan-Seet Village Corporation timber operations, the Viking Lumber Co. sawmill, fishing, fish processing, government and commercial services provide most employment. Deer, salmon, halibut, shrimp and crab are harvested for recreational or subsistence purposes. Approximately 505 residents of Craig were employed as of 2015—approximately 65% of the eligible workforce population. The 2013 Alaska All-Hazard Mitigation Plan identifies Craig as having an 8.9% unemployment rate.

Facilities

All households are fully plumbed. Water is supplied by a dam on North Fork Lake, then is treated, stored in a tank, and piped to homes. Sewage is collected by a piped gravity system, and receives primary treatment before discharge into Bucareli Bay. Refuse is collected and deposited in Klawock's landfill. The City also participates in annual hazardous waste collection events. Alaska Power & Telephone Co. owns and operates diesel power systems and a hydroelectric facility at Black Bear Lake, which provides electricity to many Prince of Wales Island communities.

Transportation

Scheduled air transportation to Ketchikan is available from the nearby Klawock airport. The City owns and maintains a seaplane base at Klawock Inlet. The State ferry no longer serves Prince of Wales Island. The Interisland Ferry operates a daily ferry between Hollis and Ketchikan and operates several days a week for the summer months from Coffman Cove to Wrangell and Petersburg.

There are two small boat harbors, at North Cove and South Cove, a small transient float and dock in the downtown area, and boat launch ramps at North Cove and False Island.

The J.T. Brown Marine Industrial Center on False Island, on the north side of Crab Bay includes a boat launch ramp and a vessel haul out trailer capable of moving boats up to 60 tons out of the water to adjacent work and storage areas.

Freight arrives by plane into the Klawock Airport and various seaplane bases; barge into Thorne Bay; and ferry into Hollis and Coffman Cove. A paved road exists between Hollis, Craig, Klawock, Thorne Bay and north to the Coffman Cove junction on the United States Forest Service (USFS) 20 Road and into Coffman Cove on the USFS 30 Road.

Climate

Prince of Wales Island is dominated by a cool, moist, maritime climate. Summer temperatures range from 49 to 63 degrees Fahrenheit (°F). Winter temperatures range from 32 to 42 (°F). Average annual precipitation is 97 inches, and average annual snowfall is 23 inches. Gale winds are common in the fall and winter months.

Vegetation and Soils

Sitka spruce and hemlock forest thrive in Craig's cool, moist, maritime climate. Western hemlocks are the dominant coniferous species, followed by the Sitka Spruce, with a scattering of mountain hemlock, western red cedar, and Alaska cedar. The understory is characterized by rusty menziesia, devil's club, salal, and a variety of wild berries. Mosses, ferns, bunchberry, twisted stalk, and deerberry are the dominant ground cover species. Black cottonwood and red alder occur parallel to streams. Heaths, grasses,

and low growing plants create the Alpine flora at elevations above the timberline. Muskegs dominate areas with poor soil drainage. Muskegs are composed of sphagnum mosses, sedges, and varying amount of rushes, crowberry, Labrador tea, bog rosemary, Oregon crab apple, shore pine, and stunted conifers.

Craig sits atop highly metamorphosed volcanic and sedimentary rocks with some igneous intrusions. A variety of soils cover the area including glacial till, crushed rock, beach gravel, and organic and root soils. Organic soils formed entirely of plant material in various stages of decomposition create muskegs in local lowlands.

Craig Capability Assessment

Local Resources

Craig has a number of planning and land management tools that will allow it to implement hazard mitigation activities. The resources available in these areas are summarized in the following tables.

Table 6. Regulatory Tools

Regulatory Tools (ordinances, codes, plans)	Local Authority (Yes/No)	Year of Most Recent Update
Building code (Development code)	Yes	
Zoning ordinance	Yes	
Subdivision ordinance or regulations	Yes	
Special purpose ordinances (floodplain management, stormwater management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	No	
Growth management ordinances (also called “smart growth” or anti-sprawl programs)	Yes	
Site plan review requirements	No	
Comprehensive plan	Yes	2017 (Draft)
A capital improvements plan	Yes	Annually

An economic development plan	Yes	Annually
An emergency response plan	Yes	2017 (Draft)
A post-disaster recovery plan	No	
Real estate disclosure requirements	No	

Table 7. Staff/Personnel Resources

Staff/Personnel Resources	Yes/No	Department/Agency and Position
City Administrator	Yes	Administration
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	No	
Planners or Engineer(s) with an understanding of natural and/or human-caused hazards	Yes	City Planner
Floodplain manager	No	
Surveyors	No	
Staff with education or expertise to assess the community's vulnerability to hazards	Yes	City Planner
Personnel skilled in GIS and/or HAZUS	Yes	City Planner
Scientists familiar with the hazards of the community	No	None
Emergency manager	Yes	
Grant writers	Yes	

Table 8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes or No)
Community Development Block Grants (CDBG)	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for sewer	Yes
Impact fees for homebuyers or developers for new developments/homes	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax and revenue bonds	Yes
Incur debt through private activity bonds	No
Withhold spending in hazard-prone areas	No

State Resources

- **Alaska DHS&EM** is responsible for coordinating all aspects of emergency management for the State of Alaska. Public education is one of its identified main categories for mitigation efforts.

Improving hazard mitigation technical assistance for local governments is another high priority list item for the State of Alaska. Providing hazard mitigation training, current hazard information, and the facilitation of communication with other agencies would encourage local hazard mitigation efforts. DHS&EM provides resources for mitigation planning on their *Website* at http://www.ak-prepared.com.

- **DCCED DCRA** Provides training and technical assistance on all aspects of the National Flood Insurance Program and flood mitigation.

Other state resources include:

- **Division of Senior Services:** Provides special outreach services for seniors, including food, shelter, and clothing.

- **Division of Insurance:** Provides assistance in obtaining copies of policies and provides information regarding filing claims.

- **Department of Military and Veterans Affairs:** Provides damage appraisals and settlements for VA-insured homes, and assists with filing of survivor benefits.

Federal Resources

The federal government requires local governments to have a hazard mitigation plan in place to be eligible for funding opportunities through FEMA such as the Pre-Disaster Mitigation Assistance Program and the Hazard Mitigation Grant Program. The Mitigation Technical Assistance Programs available to local governments are also a valuable resource. FEMA may also provide temporary housing assistance through rental assistance, mobile homes, furniture rental, mortgage assistance, and emergency home repairs. The Disaster Preparedness Improvement Grant also promotes educational opportunities with respect to hazard awareness and mitigation.

FEMA, through its Emergency Management Institute, offers training in many aspects of emergency management, including hazard mitigation. FEMA has also developed a large number of documents that address implementing hazard mitigation at the local level. Five key resource documents are available from FEMA Publication Warehouse (1-800-480-2520) and are briefly described below:

- **How-to Guides.** FEMA has developed a series of how-to guides to assist states, communities, and tribes in enhancing their hazard mitigation planning capabilities. The first four guides mirror the four major phases of hazard mitigation planning used in the development of the Craig Hazard Mitigation Plan. The last five how-to guides address special topics that arise in hazard mitigation planning such as conducting cost-benefit analysis and preparing multi-jurisdictional plans. The use of worksheets, checklists, and tables make these guides a practical source of guidance to address all stages of the hazard mitigation planning process. They also include special tips on meeting Disaster Mitigation Act (DMA) 2000 requirements (http://www.fema.gov/fima/planhowto.shtm).

- **Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments.** FEMA DAP-12, September 1990. This handbook explains the basic concepts of hazard mitigation and shows state and local governments how they can develop and achieve mitigation goals within the context of FEMA's post-disaster hazard mitigation planning requirements. The handbook focuses on approaches to mitigation, with an emphasis on multi-objective planning.

- **Mitigation Resources for Success CD.** FEMA 372, September 2001. This CD contains a wealth of information about mitigation and is useful for state and local government planners and other stakeholders in the mitigation process. It provides

mitigation case studies, success stories, information about Federal mitigation programs, suggestions for mitigation measures to homes and businesses, appropriate relevant mitigation publications, and contact information.

- **A Guide to Federal Aid in Disasters.** FEMA 262, April 1995. When disasters exceed the capabilities of state and local governments, the President's disaster assistance program (administered by FEMA) is the primary source of federal assistance. This handbook discusses the procedures and process for obtaining this assistance, and provides a brief overview of each program.

- **The Emergency Management Guide for Business and Industry.** FEMA 141, October 1993. This guide provides a systematic approach to emergency management planning, response, and recovery. It also details a planning process that businesses can follow to better prepare for a wide range of hazards and emergency events. This effort can enhance a business's ability to recover from financial losses, loss of market share, damages to equipment, and product or business interruptions. This guide could be of great assistance to Craig businesses.

Other federal resources include:

- **Department of Agriculture.** Assistance provided includes: Emergency Conservation Program, Non-Insured Assistance, Emergency Watershed Protection, Rural Housing Service, Rural Utilities Service, and Rural Business and Cooperative Service.

- **Department of Energy, Office of Energy Efficiency and Renewable Energy, Weatherization Assistance Program.** This program minimizes the adverse effects of high energy costs on low-income, elderly, and handicapped citizens through client education activities and weatherization services such as an all-around safety check of major energy systems, including heating system modifications and insulation checks.

- **Department of Housing and Urban Development, Office of Homes and Communities, Section 108 Loan Guarantee Programs.** This program provides loan guarantees as security for federal loans for acquisition, rehabilitation, relocation, clearance, site preparation, special economic development activities, and construction of certain public facilities and housing.

- **Department of Housing and Urban Development, Community Development Block Grants.** Administered by Alaska Department of Commerce, Community and Economic Development (DCCED) DCRA. Provides grant assistance and technical assistance to aid communities in planning activities that address issues detrimental to the health and safety of local residents, such as housing rehabilitation, public services, community facilities, and infrastructure improvements that would primarily benefit low- and moderate-income persons.

- **Department of Labor, Employment and Training Administration, Disaster Unemployment Assistance.** Provides weekly unemployment subsistence grants for those who become unemployed because of a major disaster or emergency. Applicants must have exhausted all benefits for which they would normally be eligible.

- **Federal Financial Institutions.** Member banks of FDIC, FRS or FHLBB may be permitted to waive early withdrawal penalties for Certificates of Deposit and Individual Retirement Accounts.

- **Internal Revenue Service, Tax Relief.** Provides extensions to current year's tax return, allows deductions for disaster losses, and allows amendment of previous tax returns to reflect loss back to three years.

- **United States Small Business Administration.** May provide low-interest disaster loans to individuals and businesses that have suffered a loss due to a disaster. Requests for SBA loan assistance should be submitted to the Alaska Division of Homeland Security and Emergency Management.

Other resources: The following are *website*s that provide focused access to valuable planning resources for communities interested in sustainable development activities.

- **Federal Emergency Management Agency,** http://www.fema.gov – includes links to information, resources, and grants that communities can use in planning and implementation of sustainable measures.

- **American Planning Association,** http://www.planning.org – a non-profit professional association that serves as a resource for planners, elected officials, and citizens concerned with planning and growth initiatives.

- **Institute for Business and Home Safety,** http://ibhs.org – an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses, and human suffering caused by natural disasters. Online resources provide information on natural hazards, community land use, and ways citizens can protect their property from damage.

Other Funding Sources and Resources

- **Real Estate Business.** State law for properties within flood plains requires real estate disclosure.

- **American Red Cross.** Provides for the critical needs of individuals such as food, clothing, shelter, and supplemental medical needs. Provides recovery needs such as furniture, home repair, home purchasing, essential tools, and some bill payment may be provided.

- **Crisis Counseling Program.** Provides grants to State and City mental health departments, which in turn provide training for screening, diagnosing and counseling techniques. Also provides funds for counseling, outreach, and consultation for those affected by disaster.

Chapter 3: Risk Assessment, General Overview

Section 1. Requirements

> Section 201.6(c)(2) of the mitigation planning regulation requires local jurisdictions to provide sufficient hazard and risk information from which to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. (FEMA 386-8)

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, and disruption to local and regional economies, environmental damage and disruption, and the amount of public and private funds spent to assist with recovery.

Mitigation efforts begin with a comprehensive risk assessment. A risk assessment measures the potential loss from a disaster event caused by an existing hazard by evaluating the vulnerability of buildings, infrastructure, and people. It identifies the characteristics and potential consequences of hazards and their impact on community assets.

Federal Requirements for Risk Assessment

Federal regulations for hazard mitigation plans outlined in 44 CFR Section §201.6(c)(2) include a requirement for a risk assessment. This risk assessment requirement is intended to provide information that will help the community identify and prioritize mitigation activities that will prevent or reduce losses from the identified hazards. The federal criteria for risk assessments and information on how the Craig MHMP meets those criteria are outlined below:

Table 9. Risk Assessments - Federal Requirements

Section §201.6(c)(2) Requirement	Where Requirement is Addressed in the Craig Multi-Hazard Mitigation Plan
Identifying Hazards §201.6(c)(2)(i) The risk assessment *shall* include a description of the type . . . of all natural hazards that can affect the jurisdiction . . .	Chapter 3, Section 2 identifies tsunami, ground failure, earthquake, severe weather, wildland fire, and climate change as the top six natural hazards in Craig.

Section §201.6(c)(2) Requirement	Craig Multi-Hazard Mitigation Plan Where it is Addressed in Plan
Profiling Hazards §201.6(c)(2)(i) The risk assessment *shall* include a description of the . . . location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	Chapter 4, Sections 1-6 include hazard-specific sections of the Craig MHMP and profiles the natural hazards that may affect the City. The Plan includes **location, extent, probability, and impact** for each natural hazard identified. The MHMP also provides hazard specific information on **past occurrences** of hazard events.
Assessing Vulnerability: Overview §201.6(c)(2)(i) The risk assessment *shall* include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.	Chapter 3, Section 3 discusses vulnerabilities for the City of Craig. Chapter 4, Sections 1-6 contain overall summaries of each hazard and the impacts on the community are contained in each hazard specific section in the chapter. Section 7 contains information regarding hazards not profiled in this MHMP.
Assessing Vulnerability: Addressing Repetitive Loss Properties §201.6(c)(2)(ii) The risk assessment in all plans approved after October 1, 2008 must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.	Craig does not participate in the National Flood Insurance Program.
Assessing Vulnerability: Identifying Structures §201.6(c)(2)(ii)(A) The plan *should* describe vulnerability in terms of the types and number of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.	Chapter 3, Section 1, Table 13 lists existing structures, infrastructure, and critical facilities located in the identified hazard areas. The narrative describes vulnerability in terms of the types and number of future buildings.
Assessing Vulnerability: Estimating Potential Losses §201.6(c)(2)(ii)(B) The plan *should* describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.	Chapter 3, Section 2, Table 14 estimates potential dollar losses to municipal owned facilities. The methodology used to obtain the losses is described following the table.

Assessing Vulnerability: Land Uses and Development Trends §201.6(c)(2)(ii)(C) The plan should describe vulnerability in terms of providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	The last section of Chapter 3 contains this information.

Vulnerability Assessment Methodology

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, and disruption to local and regional economies, environmental damage and disruption, and the amount of public and private funds spent to assist with recovery.

Mitigation efforts begin with a comprehensive risk assessment. A risk assessment measures the potential loss from a disaster event caused by an existing hazard by evaluating the vulnerability of people, buildings, and infrastructure. It identifies the characteristics and potential consequences of hazards and their impact on community assets.

A risk assessment typically consists of three components: hazards identification, vulnerability assessment, and risk analysis.

1. ***Hazards Identification*** - The first step in conducting a risk assessment is to identify, profile hazards, and their possible effects on the jurisdiction. This information can be found in Chapter 3: Hazards.

2. ***Vulnerability Assessment*** – Step 2 is to identify the jurisdiction's vulnerability; the people, infrastructure, and property that are likely to be affected. It includes everyone who enters the jurisdiction including employees, commuters, shoppers, tourists, and others.

Populations with special needs such as children, the elderly, and the disabled should be considered; as should facilities such as the hospital, health clinic, senior housing, and schools because of their additional vulnerability to hazards.

Inventorying the jurisdiction's assets to determine the number of buildings, their value, and population in hazard areas can also help determine vulnerability. A jurisdiction with many high-value buildings in a high-hazard zone will be extremely vulnerable to financial devastation brought on by a disaster event.

Identifying hazard prone critical facilities is vital because they are necessary during response and recovery phases.

Critical facilities include:

- Essential facilities, which are necessary for the health and welfare of an area and are essential during response to a disaster, including hospitals, fire stations, police stations, and other emergency facilities;
- Transportation systems such as highways, airways and waterways;
- Utilities, water treatment plants, communications systems, power facilities;

- High potential loss facilities such as bulk fuel storage facilities;
- Hazardous materials sites; and
- Other items to identify critical facilities include economic elements, areas that require special considerations, historic, cultural and natural resource areas, and other jurisdiction-determined important facilities.

3. ***Risk Analysis*** – The next step is to calculate the potential losses to determine which hazard will have the greatest impact on the jurisdiction. Hazards should be considered in terms of their frequency of occurrence and potential impact on the jurisdiction. For instance, a possible hazard may pose a devastating impact on a community but have an extremely low likelihood of occurrence. Such a hazard must take lower priority than a hazard with only moderate impact but a very high likelihood of occurrence.

For example, there might be several schools exposed to one hazard but one school may be exposed to four different hazards. A multi-hazard approach will identify such high-risk areas and indicate where mitigation efforts should be concentrated.

The purpose of a vulnerability assessment is to identify the assets of a community that are susceptible to damage should a hazard incident occur.

Facilities are designated as critical if they are: (1) vulnerable due to the type of occupant (children, disabled or elderly); (2) critical to the community's ability to function (roads, power generation facilities, water treatment facilities, etc.); (3) have a historic value to the community (museum, cemetery); or (4) critical to the community in the event of a hazard occurring (emergency shelter, etc.).

Please see Table 13 - Hazard Assets Matrix for an inventory of critical facilities and their vulnerability to identified hazards.

This hazard plan includes an inventory of critical facilities from the records and land use map (Appendix B).

The description of each of the identified hazards includes a narrative and in some cases a map of the following information:

- The **location** or geographical area(s) of the hazard in the community.
- The **extent** (i.e. magnitude or severity) of potential hazard events, based on the criteria listed in Table 10,

Table 10 was used to rank the extent of each hazard. Sources of information to determine the extent include the 2013 State of Alaska *All-Hazard Mitigation Plan*, historical or past occurrences, and other outside sources.

Table 10. Extent of Hazard Ranking

Magnitude/Severity	Criteria to Determine Extent
Catastrophic	Multiple deaths Complete shutdown of facilities for 30 or more days More than 50% of property severely damaged
Critical	Injuries and/or illnesses result in permanent disability Complete shutdown of critical facilities for at least 2 weeks More than 25% of property is severely damaged
Limited	Injuries and/or illnesses do not result in permanent disability Complete shutdown of critical facilities for more than one week More than 10% of property is severely damaged
Negligible	Injuries and/or illnesses are treatable with first aid Minor quality of life lost Shutdown of critical facilities and services for 24 hours or more Less than 10% of property is severely damaged

- The **impact** of each hazard to the community.
- **Past occurrences** of each hazard to the community.
- The **probability** of the likelihood that the hazard event would occur in an area.

The following table, taken from the 2013 State of Alaska *All-Hazard Mitigation Plan* categorizes the probability of a hazard occurring. Sources of information to determine the probability for each specific hazard include the 2013 State of Alaska *Hazard Mitigation Plan*, historical or past occurrences, and information from the location of the hazard.

Table 11. Probability Criteria Table

Probability	Criteria Used to Determine Probability
4 - Highly Likely	Event is probable within the calendar year. Event has up to 1 in 1 year's chance of occurring (1/1=100%). History of events is greater than 33% likely per year. Event is "Highly Likely" to occur.
3 - Likely	Event is probable within the next three years. Event has up to 1 in 3 year's chance of occurring (1/3=33%). History of events is greater than 20% but less than or equal to 33% likely per year. Event is "Likely" to occur.
2 - Possible	Event is probable within the next five years. Event has up to 1 in 5 year's chance of occurring (1/5=20%). History of events is greater than 10% but less than or equal to 20% likely per year. Event could "Possibly" occur.
1 - Unlikely	Event is possible within the next ten years. Event has up to 1 in 10 year's chance of occurring (1/10=10%).

	History of events is less than or equal to 10% likely per year. Event is "Unlikely" but is possible of occurring.

- **Past occurrences** of hazard events.

The past occurrences of natural events are described for identified natural hazards. The information was obtained from the 2013 State of Alaska *All-Hazard Mitigation Plan*, *State Disaster Cost Index*, City records, other state and federal agency reports, newspaper articles, and web searches.

Section 2. Identifying Hazards

The 2013 State of Alaska *All-Hazard Mitigation Plan* does not list the City of Craig on the state hazard matrix or previous occurrences table.

Identification of Natural Hazards Present in Craig

Based on consultation with the Alaska DHS&EM, City of Craig staff and the Planning and Zoning Commission, Craig plans and reports, interviews and newspaper articles, Craig identified the following ***highest risk hazards*** to be profiled.

Table 12. Hazards Identification and Decision to Profile

Hazard	Yes/No	Decision to Profile Hazard
Tsunami	Yes	Identified as a hazard by the City of Craig, DHS&EM, and NOAA.
Ground Failure	Yes	Risk to City critical infrastructure.
Earthquake	Yes	Located near the Queen Charlotte – Fairweather System.
Severe Weather	Yes	Craig is subject to high winds, heavy rainfall/snow.
Flood/Erosion	No	The City does not participate in the National Flood Insurance Program. The City identifies neither flooding nor erosion as a hazard.
Wildland Fire	Yes	The soil conditions and abundant rainfall combine to make a wildland fire hazard unlikely within the city limits of Craig; however, Craig would like this hazard profiled.
Volcano	No	The Alaska Volcano Observatory identifies the closest active volcano to Craig as over 400 miles away.
Snow Avalanche	No	Not identified by the City as a risk within the city limits of Craig.
Climate Change	Yes	New hazard to be added to 2017 MHMP; City of Craig would like this hazard profiled.

Please see Section 7, Hazards not present in Craig, for more information on the hazards not present in the community.

Section 3. Assessing Vulnerability

Overview

The vulnerability overview section is a summary of Craig's vulnerability to the above-identified hazards. The summary includes the types of structures, infrastructures, and critical facilities with the potential to be affected by identified hazards.

The following maps and tables illustrate critical facilities and their vulnerability to natural hazards in Craig.

1. Map 2. Critical Infrastructure

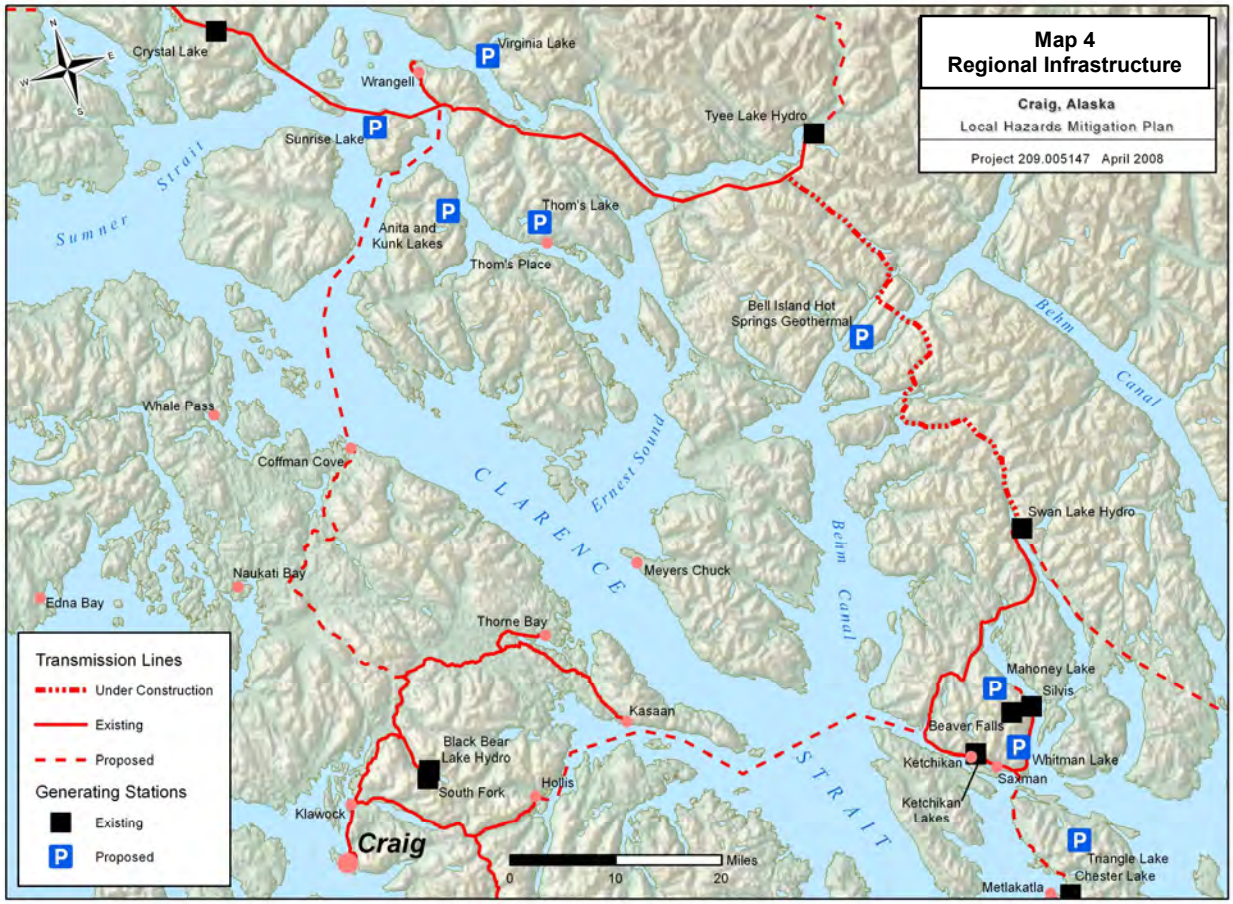
2. Map 3. Regional Infrastructure

3. Table 13. Hazard Assets Matrix

4. Table 14. Potential Dollar Losses of Municipal Structures

Map 2. Critical Infrastructure

Map 3. Regional Infrastructure



Hazard Asset Matrix

The Hazard Asset Matrix below contains the critical infrastructure and their vulnerability to identified natural hazards.

Table 13. Hazard Asset Matrix

Structure/Facility	Earthquake	Tsunami*	Severe Weather	Ground Failure	Wildland Fire
1. Craig Cannery Dock	M	H	M		L
2. Industrial Crane	M	H	M		L
3. Shaan Seet Industrial Dock	M	H	M		L
4. Child Care Center		L	M		L
5. City Hall	M	L	M		L
6. Fire Hall	M	L	M		L
7. Police Station		L	M		L
8. Health Clinic	M	L	M		L
9. Municipal Water Tanks		L	M	H	L
10. Municipal Water Treatment Plant		L	M	H	L
11. AK Power & Telephone Plant	M	L	M		L
12. AK Power Company	M	L	M		L
13. Seaplane Terminal	M	H	M		L
14. North Cove Boat Launch	M	H	M		L
15. U.S. Forest Service	M	M	M		L
16. U.S. Post Office	M	L	M		L
17. Middle School	M	L	M		L
18. Elementary School	M	L	M		L
19. Emergency Helipad	M	M	M		L
20. Craig High School	M	L	M		L
21. AK Power & Telephone	M	-	M		L
22. Tank Farm and Fuel Facilities	M	H	M		L
23. Regional Transmission Lines	M	M	M		L
24. Regional Generating Stations	M	M	M		L
25. Youth Center	M	L	M		L
26. Salmon Hatchery	M	L	M		L
27. Library	M	L	M		L
28. Sewage Plant	M	M	M		L
29. Gym	M	L	M		L
30. Swimming Pool/Fitness	M	L	M		L

Center					
31. Harbormaster Building	M	L	M		L
32. North Cove Harbor	M	H	M		L-M
33. South Cove Harbor	M	H	M		L-M
34. City Dock and Floats	M	H	M		L-M
35. JTB Facilities	M	M	M		L-M

L (Low) = Hazard is present with a low probability of occurrence within the next ten years. Event has up to 1 in 10 year's chance of occurring.
M (Moderate) = Hazard is present with a moderate probability of occurrence within the next three years. Event has up to 1 in 3 year's chance of occurring.
H (High) = Hazard is present with a high probability of occurrence within the calendar year. Event has up to 1 in 1 year's chance of occurring.

*We have obtained draft tsunami inundation maps for Craig. This information will help in determining the vulnerability of structures. The maps are currently in draft form and will be published in 2018.

Vulnerability – Current and Future Structures in Hazard Zones

In April 2009, two significant building projects were completed in Craig: a seafood-processing plant and a new health care clinic. Since federal funds were used for these projects, an engineering review was required to determine whether the structures were located above the Base Flood Elevation (BFE) for a 100-year flood. Craig does not participate in the National Flood Insurance Program and does not have mapped flood zones, however, an engineer reviewed the projects to ensure that the BFE was over a potential 100-year flood, using best available data. Per the last U.S. Army Corps of Engineers Update on June 28, 2017, the BFE is +18 feet mean lower low water.

New public structures in Craig are built to withstand the identified hazards of earthquake, severe weather, and ground failure. Tsunami mapping for the Craig area was completed in 2015, and currently, new structures are built over the BFE.

Estimating Potential Dollar Losses

The following table lists the replacement values plus content values of municipal owned buildings. Please see the paragraph below the table for the methodology used to arrive at the potential dollar losses.

Table 14. Potential Dollar Losses of Municipal Structures

Municipal Owned Structures	Year Built/ Size*	Replacement Value
1. City Hall		$725,000
2. Youth Center		$285,000
3. Salmon Hatchery		$46,000
4. Child Care Center		$264,000
5. Float Plane Dock		$550,000

Municipal Owned Structures	Year Built/ Size*	Replacement Value
6. Float Plane Building		$360,000
7. P/PF Shop		$365,000
8. Public Works Shop		$627,778
9. Public Works Shed		$54,000
10. Public Works Equipment Shed		$240,000
11. Police Jail Building		$644,667
12. Fire Department		$265,378
13. Library		$253,000
14. Sewage Plant		$1,000,000
15. Pump House (East Hamilton)		$99,785
16. Sewer Pump (Beach Road)		$83,333
17. Sewer Pump (West Hamilton)		$150,000
18. Sewer Lift (Crab Creek)		$76,667
19. Sewer Lift (High School)		$87,778
20. Water Treatment Plant		$1,402,667
21. Water Tank (PSN Road)		$1,000,000
22. Water Tank (Spruce Street)		$400,000
23. Gym		$848,889
24. Swimming Pool/Fitness Center		$2,208,000
25. Health Clinic		$4,285,000
26. Harbormaster Building		$369,000
27. North Cove Harbor		$1,666,667
28. South Cove Harbor		$875,000
29. City Dock and Floats		$815,556
30. JTB Industrial Park Dock		$771,590
31. JTB Industrial Park Bridge		$65,000
32. JTB Industrial Park Icehouse		$475,000
33. JTB Industrial Park Icehouse Dock		$325,000
34. JTB Industrial Boat Launch		$350,000
Total Potential Dollar Losses		**$22,034,755**

Data Not Available

Source: Craig Finance Department, 2017

The City of Craig Finance Department provided the information for this table, using potential dollar loss figures from the Alaska Municipal League, who is the city insurance provider.

* Data is not available for this column.

Land Use and Development Trends

Development in Craig has occurred at about the right pace to suit the desires of its residents. However, settlement patterns have been influenced by the level of population growth, the physical characteristics of the landscape, the transportation network, and land ownership patterns.

Population growth generates land use demands for housing. In turn, land use demand for commercial and industrial uses can then be linked to corresponding increases in housing growth. These planning principles generally apply to the land use situation in Craig. The 2000 Comprehensive Plan estimated that Craig would grow to a population of 3,269 by the year 2017. This projected population growth was greatly overestimated. Craig's population estimate for 2015 was 1,180. Population growth between 2015 and 2030 is projected to be between 0.2% and 0.5% per five-year period with an estimated population in 2030 of 1,192. This population, in turn, will create a demand for approximately five new dwelling units and approximately 1.2 acres of land to accommodate the new housing. In addition to the additional units required for projected population growth, the 2016 Community Survey indicated that at least 20 new housing units (five acres) were required to meet current, unmet demand.

Where housing is located and neighborhoods are created, small-scale commercial development has followed and will likely follow in the future. As population increases, so does the demand for goods and services resulting in increases in commercial and industrial development. Most developed land in Craig, like other communities in Alaska, is devoted to extensive uses that take up a large area such as streets, single-family residences, and public and semi-public needs. The share of more intensive land uses like land used for multi-family residences, commercial and industrial uses, is relatively small. Increases in the land needs for single-family commonly are accompanied by increased demands for all other uses, especially streets and commercial uses.

Future commercial and industrial development opportunities will need to be supported to replace losses in the public sector with declining state and federal dollars and to support the seasonal fluctuations in the fishing and timber industries. Commercial and industrial development, especially along Craig's waterfront, will continue as the community grows. Existing zoning and land use designations that provide for development of some tidelands, and conservation of others, must be maintained to balance the need for both economic development and recreational and subsistence uses. The waterfront is important to Craig's economy and will require continued maintenance and upgrading in order to keep up with growth.

Craig's downtown is a major asset to the community as it provides convenient shopping opportunities to consumers, nearby residents, and supports a good variety of businesses and provides a focal point for the community. The area is, however, faced with a number of challenges: lack of public parking, unsafe pedestrian circulation, competition from East Craig businesses, and lack of space for growth. Redevelopment or reuse of land in Old Craig will open up developable lands for commercial and

industrial uses. In 2007, the City of Craig purchased the old Ward Cove Cannery property consisting of five acres of upland and five acres of tideland in the old downtown area. The long-term development of this property will include a new harbor with a 10-acre basin and moorage for approximately 145 vessels. The Cty is working with the U.S. Army Corps of Engineers on this project. Part of the cannery property has been redeveloped to increase available commercial land and to increase parking in the old downtown area. A portion of the remainder of the uplands from the cannery property will be used to support the new harbor but much of the property will be open to other development.

Land ownership has affected settlement patterns in Craig. In combination, Klawock-Heenya Corporation and Shaan-Seet Inc., own approximately more than 90% of the uplands inside the city limits of Craig. As major private landowners, the Klawock-Heenya Corporation and Shaan-Seet, Inc. have a great opportunity to participate in how land is used in the future—future settlement patterns, how, at what rate, and where growth occurs.

Chapter 4. Risk Assessment, Hazard Specific Sections

Section 1. Tsunami Hazard

Hazard Description

A tsunami is a series of long waves generated in the ocean by a sudden displacement of a large volume of water. Underwater earthquakes, landslides, volcanic eruptions, meteor impacts, or onshore slope failures can cause this displacement. Most tsunamis originate in the Pacific "Ring of Fire", the area of the Pacific bounded by the eastern coasts of Asia and Australia and the western coasts of North America and South America that is the most active seismic feature on earth.

Tsunami waves can travel at speeds averaging 450 to 600 miles per hour. As a tsunami nears the coastline, its speed diminishes, wavelength decreases, and height increases greatly. Unusual heights have been known to be over 100 feet high. However, waves that are 10 to 20 feet high can be very destructive and cause many deaths and injuries.

After a major earthquake or other tsunami-inducing activity occurs, a tsunami could reach the shore within a few minutes. From the source of the tsunami-generating event, waves travel outward in all directions in ripples. As these waves approach coastal areas, the time between successive wave crests varies from 5 to 90 minutes. The first wave is usually not the largest in the series of waves, nor is it the most significant. One coastal community may experience no damaging waves while another may experience destructive deadly waves. Some low-lying areas could experience severe inland inundation of water and deposition of debris of more than 1,000 feet inland.

The Alaska and Aleutian Seismic Zone that threatens Alaska has a predicted occurrence (84% probability between 1988 to 2008) based on seismic data collected during those years that an earthquake with magnitude greater than 7.4 may occur in Alaska. If an earthquake of this magnitude occurs, Alaska's coastlines can be expected to flood within 15 minutes. (WCATWC)

Landslide-generated tsunami

Craig is at greatest risk from submarine and subaerial landslides, which can generate large tsunamis. Subaerial landslides have more kinetic energy associated with them so they trigger larger tsunamis. An earthquake usually, but not always, triggers this type of landslide, and they are usually confined to the bay or lake of origin. One earthquake can trigger multiple landslides and landslide generated tsunamis. Low tide is a factor for submarine landslides because low tide leaves part of the water-saturated sediments exposed without the support of the water.

Other Types of Tsunami

Tele-Tsunami

Tele-tsunami is the term for a tsunami observed at places 1,000 kilometers from their source. In many cases, tele-tsunamis can allow for sufficient warning time and evacuation.

No part of Alaska is expected to have significant damage due to a tele-tsunami. Only one tele-tsunami has caused damage in Alaska; the 1960 Chilean tsunami. Damage occurred to pilings at MacLeod Harbor, Montague Island on Cape Pole, Kosciusko Island where a log boom broke free.

Seismically generated local tsunami

Most seismically generated local tsunamis have occurred along the Aleutian Arc. Other locations include the back arc area in the Bering Sea and the eastern boundary of the Aleutian Arc plate. They generally reach land 20 to 45 minutes after starting.

Seiches

A seiche is a wave that oscillates in partially or totally enclosed bodies of water. They can last from a few minutes to a few hours because of an earthquake, underwater landslide, atmospheric disturbance, or avalanche. The resulting effect is similar to bathtub water sloshing repeatedly from side to side. The reverberating water continually causes damage until the activity subsides. The factors for effective warning are similar to a local tsunami. The onset of the first wave can occur in a few minutes, giving virtually no time for warning.

Characteristics of Tsunamis

Debris: As the tsunami wave comes ashore, it brings with it debris from the ocean, including man-made debris like boats, and as it strikes the shore, creates more on-shore debris. Debris can damage or destroy structures on land.

Distance from shore: Tsunamis can be both local and distant. Local tsunamis give residents only a few minutes to seek safety and cause more devastation. Distant tsunamis originating in places like Chile, Japan, Russia, or other parts of Alaska can also cause damage.

High tide: If a tsunami occurs during high tide, the water height will be greater and cause greater inland inundation, especially along flood control and other channels.

Outflow: Outflow following inundation creates strong currents, which rip at structures and pound them with debris, and erode beaches and coastal structures.

Water displacement: When a large mass of earth on the ocean bottom impulsively sinks or uplifts, the column of water directly above it is displaced—forming the tsunami wave. The rate of displacement, motion of the ocean floor at the earthquake epicenter, amount of displacement of the rupture zone, and the depth of water above the rupture zone all contribute to the intensity of the tsunami.

Wave runup: Runup is the height that the wave extends up to on steep shorelines, measured above a reference level (the normal height of the sea, corrected to the state of the tide at the time of wave arrival).

Wave strength: Even small wave heights can cause strong, deadly surges. Waist-high surges can cause strong currents that float cars, small structures, and other debris.

Location

The State of Alaska DHS&EM and other agencies are engaged in a tsunami inundation mapping initiative for tsunami hazard communities around the state. These site-specific tsunami inundation maps take in to account differences in geographical features that affect tsunami run up. These maps can be used to more accurately predict the number of people and development at risk, as well as assist with land use and emergency response planning.

Alaska DHS&EM, with input from an interagency committee, has established a statewide priority list for tsunami inundation mapping. A draft tsunami inundation map for Craig is available and is shown on the following page and will be published in 2018.

Map 4. Tsunami Inundation

Extent

A tsunami in Craig could be of **critical** extent. Craig has been designated by DHS&EM and DGGS as having a moderate probability for a Pacific-wide tsunami and a high probability for a locally-generated tsunami. Craig is surrounded by Klawock Inlet, Bucareli Bay, and Crab Bay. Any of these water bodies adjacent to Craig could be a potential source of a locally-generated tsunami.

Table 10 defines a *critical* extent as an event causing one of the following: injuries and/or illnesses that result in permanent disability, complete shutdown of critical facilities for at least 2 weeks, or more than 25% of property severely damaged.

The following factors will affect the severity of a tsunami:

Coastline configuration: Tsunamis impact long, low-lying stretches of linear coastlines, usually extending inland for relatively short distances. Concave shorelines, bays, sounds, inlets, rivers, streams, offshore canyons, and flood control channels may create effects that result in greater damage. Offshore canyons can focus tsunami wave energy and islands can filter the energy. The orientation of the coastline determines whether the waves strike head-on or are refracted from other parts of the coastline. Tsunami waves entering flood control channels could reach a mile or more inland, especially if they enter at high tide.

Coral reefs: Reefs surrounding islands in the western North Pacific and the South Pacific generally cause waves to break, providing some protection to the islands.

Earthquake characteristics: Several characteristics of the earthquake that generates the tsunami contribute to the intensity of the tsunami, including the area and shape of the rupture zone.

Fault movement: Strike-slip movements that occur under the ocean create little or no tsunami hazard. However, vertical movements along a fault on the seafloor displace water and create a tsunami hazard.

Magnitude and depth: Earthquakes with greater magnitude cause more intense tsunamis. Shallow-focus earthquakes also have greater capacity to cause tsunamis.

Human activity: With increased coastal development, property damage increases, multiplying the amount of debris available to damage or destroy other structures.

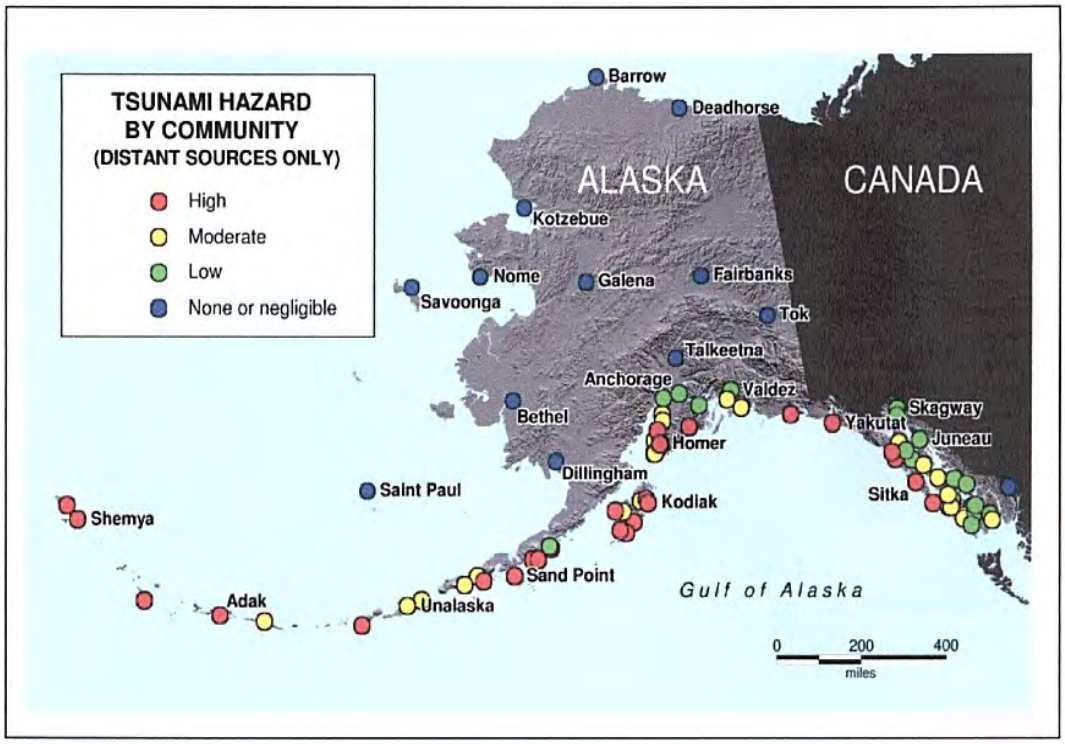
Impact

A tsunami event in Craig could damage the structures and infrastructure that are located along the shoreline in the community.

Probability

Craig has been designated by DHS&EM and DGGS as having a moderate potential for a Pacific-wide tsunami and a high potential for a locally-generated tsunami. It is **likely** that a Pacific-wide tsunami event will occur within the next three years and **highly likely** that a locally-generated tsunami occur in the next year.

A highly likely (moderate) probability is defined as the hazard being present with a moderate probability of occurrence within the next three years. The event has up to 1 in 3 year's chance of occurring.



Source: Alaska All-Hazards Risk Mitigation Plan, 2013

Figure 1. Tsunami Hazard Probability by Community

A highly likely (high) probability is defined as the hazard being present with a high probability of occurrence within the calendar year. The event has up to 1 in 1-year chance of occurring. Alaska has the greatest earthquake and tsunami potential in the entire United States. It is a very seismically active region where the Pacific plate is subducting under the North American plate. This subduction zone, the Alaska-Aleutian megathrust zone, creates high tsunami hazards for the adjacent coastal areas. The coseismic crustal movements that characterize this area have a high potential for producing vertical sea floor displacements, which are highly tsunamigenic (AEIC).

Previous Occurrences

Historic tsunamis that were generated by earthquakes in the Alaska-Aleutian subduction zone have resulted in widespread damage and loss of life along the Alaskan Pacific coast and other exposed locations around the Pacific Ocean. Seismic water waves originating in Alaska can travel across the Pacific and destroy coastal towns hours after they are generated. However, they are considered a near-field hazard for Alaska, and can reach Alaskan coastal communities within minutes after an earthquake. Therefore, saving lives and property depends on how well a community is prepared, which makes it essential to model the potential flooding area in case of a local or distant tsunami. (AEIC)

There has been at least one confirmed volcanically triggered tsunami in Alaska. In 1883, debris from the Saint Augustine volcano triggered a tsunami that inundated Port Graham with waves 30 feet high.

Research of the plans and reports cited in this document did not produce any record of damage from a tsunami in Craig. However, the reports have listed Craig as having a moderate risk of a critical event occurring.

Tsunami Mitigation Goals and Projects

Goal 1. Increase Public Education and Safety regarding potential Tsunami Hazard in Craig.

2017 Update: This goal is ingrained within the City's emergency preparedness culture.

Goal 2. Develop accurate inundation maps for the Craig coastline

2017 Update: In progress; report will be published in 2018.

Goal 3. Update Craig Emergency Response Plan, as needed.

2017 Update: In progress; report will be published in 2018.

Project T-1 Obtain tsunami inundation maps for Craig. Without these maps, Craig must rely on historical or estimated information for land use and evacuation route planning. Inundation maps will provide more accurate and precise information. (Goals 1, 2)

2017 Update: Maps will be available in 2018.

Project T-2 Update Craig Emergency Response Plan as needed. (Goals 1, 3)

2017 Update: Craig Emergency Response Plan is currently being updated.

Project T-3 Seek TsunamiReady Certification**.** This certification includes education, warning systems, evacuation planning, and signage funded through DHS&EM and NOAA. (Goal 1)

2017 Update: City of Craig has obtained the TsunamiReady Certification.

Project T-4 Evaluate tsunami warning and alerting systems including sirens, NOAA Weather Radios, and Marine band. (Goal 1)

2017 Update: The City has installed two sirens. Schools have radios; emergency advisories are received via Twitter feed.

Project T-5 Develop tsunami evacuation maps and plans. (Goals 1, 3)

2017 Update: Tsunami maps will be completed in 2018, after which the City of Craig can incorporate those studies into their evacuation maps and plans.

Project T-6 Emergency Operation Plan Exercises. Use the Emergency Response Plan in exercises regarding natural hazards including tsunami danger. (Goals 1, 3)

2017 Update: This project has been implemented and is ongoing.

Section 2. Ground Failure Hazard

Ground failure, or landslides, is a problem throughout Alaska. Ground failure hazards exist to some degree in all areas of the state.

Hazard Description

Landslides are described as downward movement of a slope and materials under the force of gravity. The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Landslides are influenced by human activity (mining and construction of buildings, railroads, and highways) and natural factors (geology, precipitation, and topography). They are common all over the United States.

Landslides occur when masses of rock, earth, or debris move down a slope. Therefore, gravity acting on an overly steep slope is the primary cause of a landslide. They are activated by storms, fires, and by human modifications to the land. New landslides occur because of rainstorms, earthquakes, volcanic eruptions, and various human activities.

Mudflows (or debris flows) are flows of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt, changing the earth into a flowing river of mud or "slurry". Slurry can flow rapidly down slopes or through channels and can strike with little or no warning at avalanche speeds. Slurry can travel several miles from its source, growing in size as it picks up trees, cars, and other materials along the way.

Other types of landslides include: rock slides, slumps, mudslides, and earthflows. All of these differ in terms of content and flow.

Landslides usually affect infrastructure such as roads and bridges, but they can also affect individual buildings and businesses.

The four types of landslides are classified according to the type of material and movement involved.

Slides
Characterized by shear displacement along one or several surfaces. The two general types of slides are rotational and translation. During a rotational slide, the ruptured surface is concave upward and the mass rotates along the concave shear surface. Rotational slides, also called slumps, can occur in bedrock, debris, or earth. In a translational slide, the rupture surface is a smooth or gently rolling slope. If an intact mass slides down a slope on a distinct shear, it is called a block slide. If rock fragments or debris slides down a slope on a distinct shear plane, it is called a rockslide or debris slide.

Flows

Fast moving soils, rocks, and organic materials mix with air and water going down a hill. They differ from slides by having higher water content and the distribution of velocities that resembles a viscous fluid. Common to Alaska are flows in bedrock, also called sackung, gravitational sagging, or ridgetop spreading. Sackung may occur slowly or may develop in response to seismic shaking.

Flows in soil or debris also include soil creep, solifluction, block streams, etc.

Creep is an imperceptibly slow, downward movement of slope-forming soil or rock due to gravity.

Solifluction is a slow, down-slope flow of water-saturated soil occurring in areas with perennially frozen ground, because the frozen ground traps snow and ice melt within the surface layer making it more fluid. In such areas, this process is properly called gelifluction. Spring rain and meltwater saturate the soil because it cannot percolate in the frozen layers below. Surface layers, during the short summers, only thaw to a small depth, creating a very unstable situation at the interface between the frozen and unfrozen layers. The result is waterlogged beds on top flow slowly down slope moving several inches per day.

Block streams are slow moving tongues of rocky debris on steep slopes, which are often fed by talus cones.

Lateral Spreads

Material can be laterally displaced or its surface materials spread apart. They often occur on gentle slops that range between 0.3 and 3 degrees and occur commonly in fine-grained soils. Slopes are especially vulnerable if the soil has been remolded or distributed by construction, grading, or similar activities. They can be produced through liquefaction, which can occur spontaneously because of changes in pore-water pressure or as the result of vibrations.

Falls and Topples

A fall is when rock or other material breaks free from a cliff or slope and moves by free fall, bouncing or rolling. Falls typically occur on steep slopes with a slope angle between 45 to 90 degrees—making fall movement very fast. Topples are a mass of rocks or soil rotating forward from a slope at a point that is below the mass' center of gravity. The movement is tilting without collapse, but if the mass pivots far enough, a fall may result.

Port St. Nicholas Area, 2003 (Templin)

Geology, precipitation, topography, and cut and fill construction practices all influence landslide activity. They often are the result of seismic activity, flooding, volcanic activity, heavy precipitation, construction work, or coastal storms. Landslides can also trigger secondary hazards, such as tsunamis and flooding.

Location

Shallow soil and steep timbered slopes in the residential area of Port St. Nicholas make landslides in this area a potential hazard. Dry periods followed by sustained heavy rainfall loosen the shallow soil and cause slides. This event has been seen throughout Prince of Wales Island. In 2003, there was a series of significant slides in this area. Although there was no loss of property or life, the increasing density of residential development in this area continues to increase the hazard of landslides having a direct effect on people and structures.

In the 2003 slides, the roads and utilities were cut off from private and public properties, including the municipal water treatment plant, for several days while debris was removed and utility lines were repaired. (Draft ERP, 2004)

Port St. Nicholas is outside the city limits of Craig. However, as noted in the Draft *Emergency Response Plan,* damage in this area leads to interruption of the municipal water supply and access into the Port St. Nicholas Subdivision.

Landslide Areas, Port St. Nicholas, 2003 (Templin)

Extent

As defined using the criteria in Table 10, the extent of damage from a landslide in Craig could be ***critical***.

Table 10 defines a *critical* extent as an event causing one of the following: injuries and/or illnesses that result in permanent disability, complete shutdown of critical facilities for at least two weeks, or more than 25% of property severely damaged.

Impact

As noted above, ground failure that occurs in the Port St. Nicholas area could close off access to residential development and impact the municipal water treatment plant and tanks.

Probability

Due to the voluminous rainfall and the soil types in Craig, the probability of a landslide in Craig is ***highly likely***. The criteria illustrated in Table 11 defines a highly likely probability as the hazard is present with a high probability of occurring within the calendar year. Event has up to 1 in 1 year's probability of occurring.

Previous Occurrences

The St. Port Nicholas area has had several landslides in the past. There is no data or written evidence as to the dollar extent of damages. Per Craig residents, 2004 may have been the last landslide occurrence in Craig.

Ground Failure Mitigation Goals and Projects

Goal 1. Reduce Craig's vulnerability to landslide hazards in terms of threat to life and property.

Goal 2. Provide the community with comprehensive information regarding ground failure hazards and unstable soils throughout Craig's developed area, including areas that will be developed in the future.

Goal 3. Increase public awareness of ground failure dangers and hazard zones.

Project GF-1 Continue to maintain the water treatment plant back-up generators, and replace as needed, to supply power in case of a landslide that interrupts power to the plant. (Goals 1, 2, 3)

2017 Update: Plant back-up generators remain an issue. Grant and City government funds have not been available. This project is also tied to earthquake and high wind (severe weather) projects.

Project GF-2 Continue to educate the public about avalanche and landslide hazards. Information can be disseminated to the public through the City website, press releases, media ads, and other methods. (Goals 1, 2, 3)

2017 Update: The City has not implemented due to lack of funding.

Project GF-3 Conduct studies of unstable soils in landslide prone areas, specifically those areas that have not yet been studied and might present additional dangers in the form of underwater ground failure, or landslides that may cause a tsunami. (Goals 1, 2, 3)

2017 Update: Tsunami mapping studies are being completed by the University of Alaska Fairbanks and will be published in 2018.

Section 3. Earthquake Hazard

Approximately 75% of Alaska's detected earthquakes occur in the Alaska Peninsula, Aleutian, Cook Inlet, and Anchorage areas. About 15% occur in Southeast Alaska, and the remaining 10% occur in the Interior. The greatest earthquake in North American history occurred in the Alaska-Aleutian seismic zone—a magnitude 9.2 lasting between four and five minutes and felt over a 7,000,000-square mile area. It caused a significant amount of ground deformation as well as triggering landslides and tsunamis resulting in major damage throughout the region. The megathrust zone where the North Pacific Plate plunges beneath the North American Plate still has the potential to generate earthquakes up to magnitude 9 (2013 State of Alaska *All-Hazard Mitigation Plan*).

Southeast Alaska also has had earthquakes from the Queen Charlotte-Fairweather fault including a magnitude 8.1 earthquake in 1949 and the magnitude 7.9 event in 1958 that triggered the giant landslide-generated wave in Lituya Bay. Areas at greatest risk from earthquakes along this fault zone are communities along the outer coast of Southeast Alaska.

Southeast Alaska sits on the boundary of two major tectonic plates: the Pacific plate in the West and the North American Plate in the East. The collision of these two plates has caused the uplift of the Coastal Mountain Range that runs the length of Southeast Alaska.

Hazard Description

Approximately 11% of the world's earthquakes occur in Alaska, making it one of the most seismically active regions in the world. Three of the 10 largest quakes in the world since 1900 have occurred here. Earthquakes of magnitude 7 or greater occur in Alaska on average of about once a year; magnitude 8 earthquakes average about 14 years between events.

Most large earthquakes are caused by a sudden release of accumulated stresses between crustal plates that move against each other on the earth's surface. Some earthquakes occur along faults that lie within these plates. The dangers associated with earthquakes include ground shaking, surface faulting, ground failures, snow avalanches, seiches and tsunamis. The extent of damage is dependent on the magnitude of the earthquake, the geology of the area, distance from the epicenter, and structure design and construction. A main goal of an earthquake hazard reduction program is to preserve lives through economical rehabilitation of existing structures and constructing safe new structures.

Ground shaking is due to the three main classes of seismic waves generated by an earthquake. Primary waves are the first ones felt, often as a sharp jolt. Shear or secondary waves are slower and usually have a side-to-side movement. They can be very damaging because structures are more vulnerable to horizontal than vertical motion. Surface waves are the slowest, although they can carry the bulk of the energy

in a large earthquake. The damage to buildings depends on how the specific characteristics of each incoming wave interact with each building's height, shape, and construction materials.

Earthquakes are usually measured in terms of their magnitude and intensity. Magnitude is related to the amount of energy released during an event while intensity refers to the effects on people and structures at a particular place. Earthquake magnitude is usually reported according to the standard Richter scale for small to moderate earthquakes.

Strike-slip faults occur when each side of the fault moves horizontally. Normal faults have one side dropping down relative to the other side. Thrust (reverse) faults have one side moving up and over the fault relative to the other side.

Earthquake-induced ground failure is often the result of liquefaction, which occurs when soil (usually sand and coarse silt with high water content) loses strength because of the shaking and acts like a viscous fluid.

Liquefaction causes three types of ground failures: lateral spreads, flow failures, and loss of bearing strength. In the 1964 earthquake, over 200 bridges were destroyed or damaged due to lateral spreads. Flow failures damaged the port facilities in Seward, Valdez, and Whittier.

Similar ground failures can result from loss of strength in saturated clay soils, as occurred in several major landslides that were responsible for most of the earthquake damage in Anchorage in 1964. Other types of earthquake-induced ground failures include slumps and debris slides on steep slopes.

The following figure was obtained from http://earthquake.alaska.edu/.

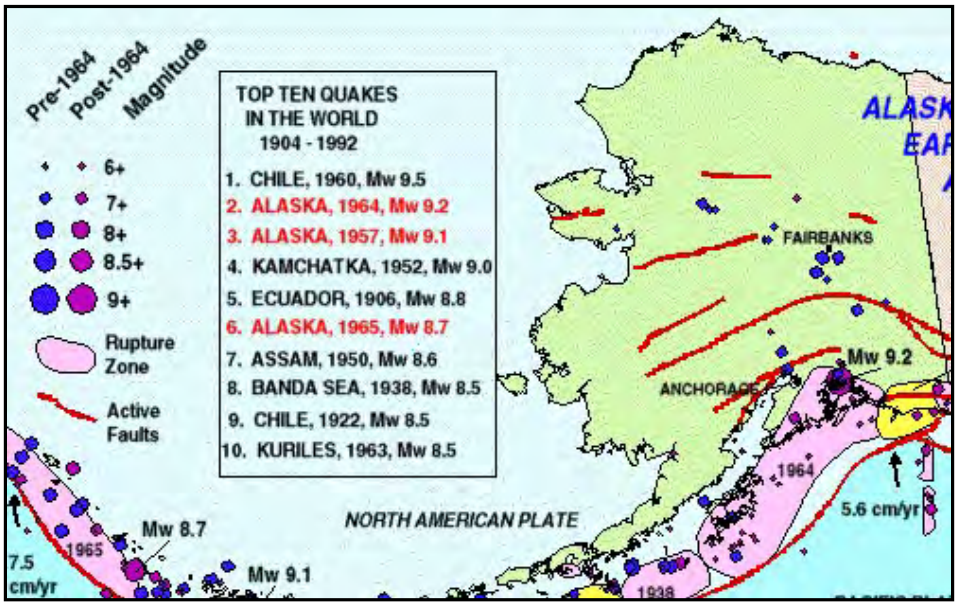


Figure 2. Earthquake Active Faults

Location

An earthquake hazard could potentially impact any part of Craig. Earthquake damage would be area-wide with potential damage to critical infrastructure up to and including the complete abandonment of key facilities. Limited building damage assessors are available in Craig to determine structural integrity following earthquake damage. Priority would be given to critical infrastructure to include: public safety facilities, health care facilities, shelters and potential shelters, and public utilities.

Southeastern Alaska

Southeastern Alaska, also known as "the panhandle", includes the area of the state from Prince Wales Island to Icy Bay. In 1904, the state's first seismic monitoring station was installed in southeastern Alaska at the Astronomical Observatory in Sitka. It was the only seismic station monitoring earthquakes in Alaska until 1935 when a second station was installed near Fairbanks. The Sitka station continues to operate today as part of a statewide network of seismograph stations (AEIC).

Major faults in the area include the Queen Charlotte fault, the Fairweather fault and the Chatham Strait fault, described in further detail below. Minor faults in the area include the Clarence Strait fault and the Peril Strait fault. The eastern end of the Denali and Transition faults (main discussions in Interior and Southcentral seismicity sections) are also found in southeastern Alaska (AEIC).

The strongest shaking will occur in muskeg, man-made fills, modern alluvial and delta deposits and volcanic ash deposits. The saturated muskeg and reworked volcanic ash would be subject to possible liquefaction during severe earthquake-caused ground shaking, and are thus unreliable as stable foundation materials.

An earthquake could also cause other disastrous events to potentially occur at the same time, such as tsunamis, fires, release of hazardous materials, and energy shortages.

Queen Charlotte - Fairweather fault system

The Queen Charlotte and Fairweather faults are part of a long fault system that marks the eastern boundary of the Pacific plate and the western boundary of the North American plate. The Pacific plate moves in a northwestward direction relative to the North American plate, creating a transform boundary—the name given to the interface between two plates moving horizontally in opposite directions. The fault associated with a transform boundary is a strike-slip fault. The Queen Charlotte and Fairweather faults are very similar to some of the most well-known strike-slip faults in the world, the faults associated with California's San Andreas Fault system.

At the northern end of the Queen Charlotte-Fairweather fault system is the Fairweather fault, a strike-slip fault with right lateral movement. The Fairweather fault is visible on land for about 280 kilometers from Cross Sound northwestward to its junction with the

St. Elias fault near Yakutat Bay. Seismic exploration methods have projected the Fairweather fault just offshore of the Alexander Archipelago from Cross Sound to the mouth of Chatham Strait. At this point, the fault is believed to connect with the Queen Charlotte fault. The Queen Charlotte fault, which extends southeastward from Chatham Strait past the Queen Charlotte Islands, is also a strike-slip fault with right lateral movement (AEIC).

Chatham Strait fault

The Chatham Strait fault is the second largest right lateral strike-slip fault in southeastern Alaska. Starting near Haines, the fault follows Lynn Canal south into Chatham Strait and is thought to be truncated by the Fairweather-Queen Charlotte fault system west of Iphigenia Bay (AEIC).

Extent

The extent of an earthquake in Craig could be ***critical***. Table 10 uses the following criteria to determine the extent of possible damage: injuries and/or illnesses result in permanent disability, complete shutdown of critical facilities for at least two weeks, or more than 25% of property is severely damaged.

Intensity is a subjective measure of the strength of the shaking experienced in an earthquake. Intensity is based on the observed effects of ground shaking on people, buildings, and natural features. It varies from place to place within the disturbed region depending on the location of the observer with respect to the earthquake epicenter.

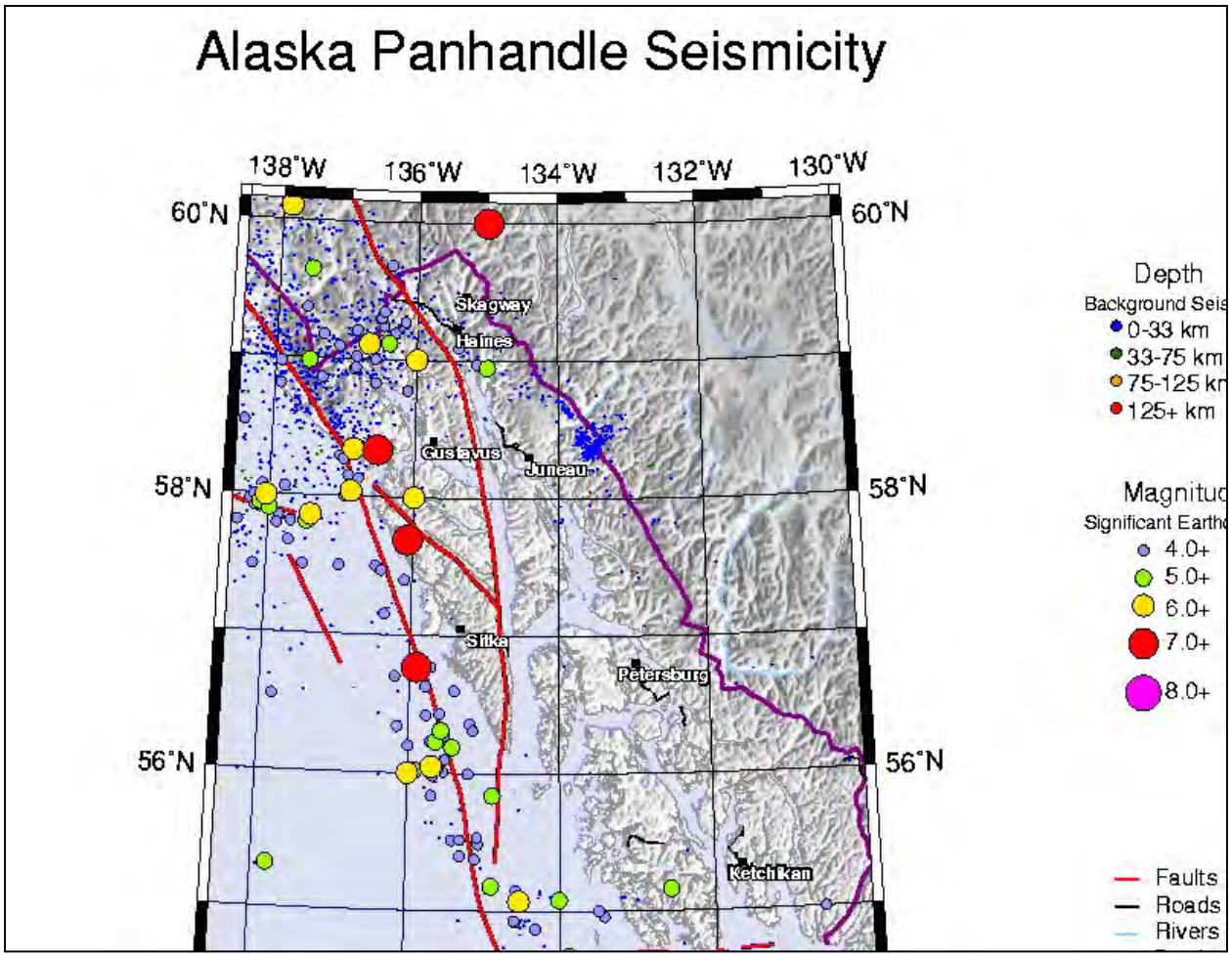
The intensity reported at different points generally decreases away from the earthquake epicenter. Local geologic conditions strongly influence the intensity of an earthquake; commonly, sites on soft ground or alluvium have intensities two to three units higher than sites on bedrock.

The Richter scale expresses magnitude as a decimal number. A 5.0 earthquake is a moderate event, 6.0 characterizes a strong event, 7.0 is a major earthquake and a great earthquake exceeds 8.0. The scale is logarithmic and open-ended (2013 State of Alaska *All-Hazard Mitigation Plan*).

A magnitude of 2.0 or less is called a microearthquake, which cannot even be felt by people and is recorded only on local seismographs. Events with magnitudes of about 4.5 or greater are strong enough to be recorded by seismographs all over the world. However, the magnitude would have to be higher than 5.0 to be considered a moderate earthquake, a large earthquake would be rated as magnitude 6.0 and major as 7.0. Great earthquakes (which occur once a year on average) have magnitudes of 8.0 or higher (British Columbia 1700, Chile 1960, Alaska 1964). The Richter Scale has no upper limit, but for the study of massive earthquakes, the moment magnitude scale is used. The modified Mercalli Intensity Scale is used to describe earthquake effects on structures.

The extent of a major earthquake in Craig could be critical. Craig is located near the Fairweather fault, which extends from south of Queen Charlotte Islands to Yakutat. The fault moves right-laterally approximately 2.25 inches per year. A study by the U.S. Geological Survey predicts a magnitude 8 or greater earthquake will occur near Craig in the future. This could be especially devastating because ground shaking can cause liquefaction of Craig's thixotropic soils.

The following figure is from AEIC. It illustrates that a major earthquake has occurred near Craig in the past and shows that a fault is located near the Craig area.



Source: http://www.aeic.alaska.edu/html_docs/information_releases.html

Figure 3. AEIC Alaska Panhandle Seismicity

Impact

A high intensity or high magnitude earthquake in Craig, because of the area-wide risk, could impact any part of the community. Interruption of critical services and damage to facilities could potentially impact any part of Craig.

Probability

Craig has a **likely** probability of earthquake hazard. Table 11 lists the following criteria for a likely probability: hazard is present with a moderate probability of occurrence within the next three years, event has up to 1 in 3 year's chance of occurring. A study by the USGS predicts a magnitude 8 or greater earthquake will occur in Southeast Alaska in the future.

While it is not possible to predict an earthquake, the USGS has developed Earthquake Probability Maps that use the most recent earthquake rate and probability models. These models are derived from earthquake rate, location, and magnitude data from the USGS National Seismic Hazard Mapping Project.

Using the USGS map shown in Figure 4, the City of Craig has a 2% probability of ground acceleration of 0.30-0.40g occurring in 50 years.

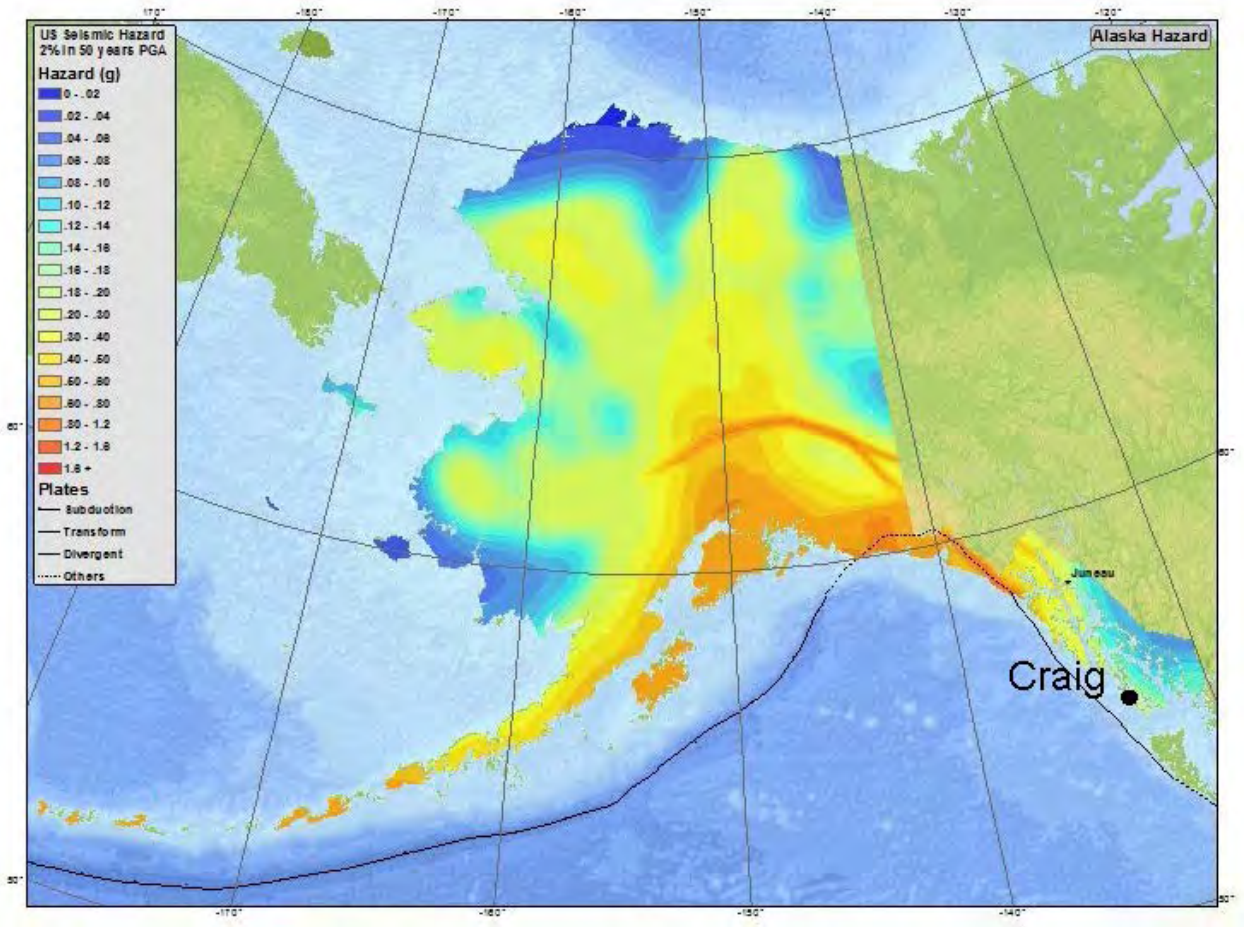


Figure 4. Statewide Earthquake Probability

Previous Occurrences

The latest major earthquake (M 7.5) near Craig occurred at 11:58 pm AKST on Friday, January 4, 2013 (January 5, 8:58 UTC) in southeastern Alaska. It was located 113 km (71 miles) WSW of Craig and 114 km (71 miles) south of Port Alexander. The Alaska Earthquake Center reported about 350 aftershocks (open circles) through the end of 2013. Due to off-shore location of these earthquakes and sparse seismic station averages, reliable locations can only be obtained for magnitude 2.5 and greater events. Twenty aftershocks had magnitudes of 4.0 or greater. The largest aftershock, magnitude 5.8, occurred on January 31 at 0:53 am AKST (9:53 UTC). The nearest seismic stations are located in Craig and Sitka.

This earthquake was felt widely in southeast Alaska and British Columbia, and as far as Seattle, Washington. Maximum intensity of shaking, V - moderate, was reported in Klawock, Hydaburg, Hyder, and Craig. Several larger aftershocks were also felt. No damage was reported; however, some residents reported items falling off the shelves.

This was the largest event to occur in the region since a magnitude 7.8 earthquake that occurred on October 28, 2012, located at Haida Gwaii, Canada west of the Queen Charlotte Archipelago and created tsunami warnings for Craig. Two aftershocks occurred within 48 hours at magnitudes 6.2 and 6.3. On January 5, 2015, a M 7.5 earthquake occurred on the Queen Charlotte fault system. This earthquake was located south of Port Alexander and northwest of Craig and created a tsunami warning for Craig. This is a strike-slip fault that marks the boundary between the Pacific crustal plate to the southwest and the North American plate to the northeast. The largest recorded earthquake that had previously ruptured this section of the fault was the magnitude 8.1 on August 22, 1949. A magnitude 7.6 earthquake occurred on July 30, 1972. The January 5 event was located near the northern end of the 1949 rupture and south of the 1972 event, i.e. it most likely occurred in the remaining rupture gap.

The elastic-wave radiation pattern of the M 7.5 event is consistent with the earthquake occurring as the result of right-lateral strike-slip faulting on a northwest-striking fault - as expected from the tectonic situation of the earthquake.

Four major earthquakes have been linked to the Queen Charlotte-Fairweather fault system in the last century. In 1927, a magnitude 7.1 (Ms - surface wave magnitude) earthquake occurred in the northern part of Chichagof Island; in 1949, a magnitude 8.1 (Mw - moment magnitude) earthquake occurred along the Queen Charlotte fault near the Queen Charlotte Islands; in 1958, movement along the Fairweather fault near Lituya Bay created a magnitude 7.9 (Ms) earthquake; and in 1972, a magnitude 7.4 (Ms) earthquake occurred near Craig. The 1958 Lituya Bay earthquake, which was felt as far away as Seattle, Washington was caused a large rockslide, which deposited the contents of an entire mountainside into the bay. The gigantic wave that resulted from this rockslide scoured the shores of the bay down to bedrock and uprooted trees as high as 540 meters above sea level. Fishing boats were carried on the wave at a reported height of at least 30 meters over the spit at the entrance to the bay and tossed into the open ocean.

Geologic evidence shows that the Chatham Strait fault was active as recently as the mid-Tertiary period and had total right lateral displacement up to 150 km.

Although a 1987 magnitude 5.3 (mb - body wave magnitude) earthquake was located near the Chatham Strait fault, very few earthquakes in the area appear to have been directly related to the fault. (AEIC)

A major earthquake of 6.8 magnitude near Craig occurred at 1:49 a.m. Alaska Daylight Time (ADT) (9:49 UTC) on Monday, June 28, 2004. The strong earthquake occurred in the Queen Charlotte Islands region near the Alaskan/Canadian border. This earthquake was situated 112 kilometers (70 miles) southwest of Craig, the nearest population center. It was felt strongly in southeastern Alaska and northern British Columbia. No injuries and only minor damage were reported. Based on the Alaska regional seismic network data, the earthquake location was at 55.072N and 134.532W at a depth of 20 km, the estimated magnitude was 6.8. This earthquake was the largest to occur in the Queen Charlotte Islands region since the magnitude 6.3 earthquake on February 17, 2001. The M6.3 shock was located at 53.987N and 133.612W, 135 km (84 miles) south of the recent M6.8 event.

The M 6.8 earthquake occurred on the Queen Charlotte fault system. This is a strike-slip fault, which marks the boundary between the Pacific crustal plate to the southwest and the North American plate to the northeast. The largest recorded earthquake that had previously ruptured this section of the fault was the magnitude 8.1 earthquake on August 22, 1949. The elastic-wave radiation pattern of the M6.8 event is consistent with the earthquake occurring as the result of right-lateral strike-slip faulting on a northwest-striking fault - as expected from the tectonic situation of the earthquake (AEIC).

Earthquake Mitigation Goal and Projects

Goal 1: Obtain funding to protect existing critical infrastructure from earthquake damage.

Project E-1. If funding is available, perform an engineering assessment of the earthquake vulnerability of each identified critical infrastructure owned by the City of Craig. (Goal 1)

2017 Update: Project has not been implemented due to the unavailability of funding.

Project E-2. Identify buildings and facilities that must be able to remain operable during and following an earthquake event. (Goal 1)

2017 Update: This has been completed. The primary facilities are the school, water treatment plant, and wastewater treatment plant.

Project E-3. Contract a structural engineering firm to assess the identified buildings and facilities to determine their structural integrity and develop a strategy to improve their earthquake resistance. (Goal 1)

2017 Update: Project has not been implemented due to the unavailability of funding.

Project E-4. Three road bridges with water lines connected under them and one additional water line bridge connect the water source to the community and are vulnerable to earthquakes. Conduct a structural seismic assessment to determine if, in a major earthquake, the only community water main would be protected. Based on the engineering assessment, add seismic retrofits to the bridges.

This project was identified in 2017.

Project E-5. With only one water storage tank (800,000 gallons) located south of the community, 80% of the population would lose drinking water if the water main was damaged at the two earthen fill locations. To mitigate this issue, construct a storage tank within the west area of the community which would supply water to 35%, and construct a storage tank within the east area of the community which would supply water to an additional 45%.

This project was identified in 2017.

Project E-6. The Craig High School is the community's primary shelter and is vulnerable to earthquakes. Install a water storage tank to serve the northern area of the community.

This project was identified in 2017.

Project E-7. A secondary water source is needed in the event that the primary treatment plant or the dam at the water source is damaged. The prime location would be the old spring which is a subterranean water source that has less stringent treatment requirements before public use.

This project was identified in 2017.

Project E-8. The wastewater treatment plant and four community shelters need emergency power backup. This project has three components.

a. Create a memorandum of agreement or pre-disaster agreement with Taylor Equipment to provide 3-50 kva generators within 30-minutes of being called. Taylor Equipment has up to 3 generators on the island all the time for rent. Additional generators could be barged in from Ketchikan as needed.
b. Install generator connections at each of the shelter buildings with segregated circuits.

c. Purchase stand-alone generators for each of the shelters with on-site fuel storage.

This project was identified in 2017.

Project E-9. From an emergency response perspective, the Klawock Airport runway is 5,000-feet long and 100-feet wide and is capable of having a Hercules C-130 aircraft land to delivery relief supplies. However, there is only 2-inches of asphalt on the airport apron. The apron cannot handle the load. This is the only land-based airport on Prince of Wales Island. Add additional asphalt to the apron to sustain the load of a Hercules C-130 aircraft in the event of an emergency.

This project was identified in 2017.

Section 4. Severe Weather

The 2004 *Emergency Response Plan* stated Craig has frequent flight service and occasional Interisland Ferry cancellation due to severe wind, storms, or fog. Seasonally, air carrier transportation of passengers, mail, and goods is severely limited. Severe storms have lasted for several days. Severe winter storms have occasionally caused power outages of short to moderate duration. During such incidents, the opening and operation of mass care facilities with alternate power sources would be essential.

Hazard Description

High Winds

Strong winds occasionally occur over the interior due to strong pressure differences, especially where influenced by mountainous terrain, but the windiest places in Alaska are generally along the coastlines. The west coast along Bristol Bay and the Bering Sea, the Aleutian Islands, Kodiak Island, the Alaska Peninsula, the Gulf of Alaska coast, and the Southeast Panhandle all experience wind storms on a fairly regular basis. Coastal areas that are framed by mountains, such as Sitka, Craig, Ketchikan, and Juneau are particularly susceptible to high winds due to the channeling effect of the terrain as storms move inland (2013 State of Alaska *All-Hazard Mitigation Plan*).

Winds can reach hurricane force and have the potential to seriously damage port facilities, the fishing industry, and community infrastructure (especially above ground utility lines).

Localized downdrafts, downbursts and microbursts, are also important in Southeast Alaska. Downbursts and microbursts can be generated by thunderstorms. Downburst winds are strong concentrated straight-line winds created by falling rain and sinking air that can reach speeds of 125 mph. The combination induces strong wind downdrafts due to aerodynamic drag forces or evaporation processes. Microburst winds are more concentrated than downbursts and can reach speeds up to 150 mph. They can cause significant damage as both can last 5 – 7 minutes. Because of wind shear and detection difficulties, they pose a big threat to aircraft landings and departures.

Heavy Snow

Heavy snow, generally more than 12 inches of accumulation in less than 24 hours, can immobilize a community by bringing transportation to a halt. Until the snow can be removed, airports and major roadways are impacted, even closed completely, stopping the flow of supplies and disrupting emergency and medical services. Accumulations of snow can cause roofs to collapse and knock down trees and power lines. Heavy snow can also damage light aircraft and sink small boats. A quick thaw after a heavy snow can cause substantial flooding. The cost of snow removal, repairing damages, and the loss of business can have severe economic impacts on cities and towns. Injuries and deaths related to heavy snow usually occur as a result of vehicle accidents. Casualties

also occur due to overexertion while shoveling snow and hypothermia caused by overexposure to the cold weather.

Location

Severe weather hazards could impact Craig on an area-wide basis. A severe weather event would create an area-wide impact and could damage structures and potentially isolate Craig from the rest of the state.

Extent

Extreme weather could result in a ***critical*** situation in Craig. Injuries and/or illness could result from excessive rainfall or snowfall, and, combined with high winds, cause shutdown of critical facilities, damage property, and isolate Craig.

Impact

Because of its remote location, Craig must be very self-reliant. Severe weather can cut off air access, limiting Medevac availability and access to goods and services, including groceries and medical supplies. Severe wind causes extensive damage to critical structures including residences and public facilities. A severe weather event would create an area-wide impact and could damage structures and potentially isolate Craig from the rest of the state.

Probability

Craig has a ***moderate*** probability of severe weather, which is defined as the hazard is present with a moderate probability of occurrence within the next three years.

Previous Occurrences

The following occurrences of severe weather have been documented for the City of Craig.

Wrangell/Craig, November 6, 1978. During this period, an intense storm occurred in the Wrangell/Craig area in Southeastern Alaska generating high winds, torrential rains, and heavy sea waves. The storm caused considerable damage to both private and public property in the two communities. Subsequent to the Governor's Proclamation of Disaster Emergency, DHS&EM provided both public assistance and assistance to individuals and families to assist the communities in recovering from the disaster. SBA made disaster loans available to affected businesses and homeowners. (2016 *State of Alaska Disaster Cost Index*)

Southeast Alaska, November 26, 1984. A hurricane force windstorm and wind-driven tides caused extensive damage to public and private property in five Southeast Alaskan communities. The State provided public and individual assistance grants and temporary

housing in Juneau, **Craig**, Kake, Angoon and Tenakee Springs. SBA provided disaster loan assistance and the American Red Cross made grants to meet immediate needs of victims. The Governor's request for a Presidential declaration was denied. (2016 *State of Alaska Disaster Cost Index*)

Southeast Alaska, December 9-10, 1998. Dangerously high winds occurred throughout much of Southeast Alaska overnight on December 9 – 10, 1998, as a deep low-pressure system curved northward along the coast. The windstorm caused widespread power and telephone outages, downed dozens of trees, and damaged homes, buildings, and airplanes. Winds in excess of 70 mph, and as high as 101 mph, were recorded across the region. (2013 State of Alaska *All-Hazard Mitigation Plan*)

September 29, 2001: High Wind. A deep low-pressure system rolled up the southern outer coast of the Panhandle bringing very strong southeast winds to the area. Peak winds recorded during the event include 75 mph at the Ketchikan Airport tower, 58 mph winds in Saxman, 70 mph winds in Metlakatla, 75 mph winds at Hydaburg Seaplane Base, and 80 mph winds in **Craig**. Part of the pilothouse was blown off of the F/V Jackie. Debris struck the F/V Island Fox, damaging the gillnet drum and hydraulics. A large section of roof was blown off a trailer in Metlakatla during the storm.

November 2-3, 2001: High Wind. A very powerful 952 mb low in the northeast Gulf of Alaska brought very high winds to Southeast Alaska. Hurricane force winds were reported at several locations including **Craig** (85 mph), Yakutat (84 mph), Cape Spencer (83 mph), Ketchikan Harbor (74 mph), and downtown Juneau (74 mph). A large factory ship positioned in the northeast Gulf south of Cape Fairweather reported 115 mph winds with a peak gust of 164 mph.

December 23, 2001: High Wind. A strong weather front moving into the southern portion of Southeast Alaska brought strong gusty winds to that area during the evening hours. A second portion of the front came close enough to increase the winds again along the outer coast overnight. A peak gust of 93 mph was recorded in Craig near midnight, Cape Decision had 65 mph, Hydaburg had 64 mph, and Ketchikan terminal roof had 63 mph. Trees were blown over, downing power lines in Craig. Also, some trees fell on a shed, crushed some stairs, and blew a metal roof off of a trailer.

December 15, 2003: High Wind. A powerful front, associated with a low in the Aleutian chain, lifted through southern Southeast Alaska. Damaging south-southeast winds resulted. Peak winds included: 82 mph at the Hydaburg AWOS, 60 mph at the Ketchikan airport, and estimated gusts to 80 mph in both Craig and Metlakatla. The high winds downed trees and broke power lines in numerous locations. Power outages occurred in the communities of Craig, Thorne Bay, and Hydaburg. In Metlakatla harbor, high winds tore a third of the roof off a three-story cold storage building. The concrete structure had a wood and shingle roofing system.

Southeast Storm (AK-06-216) declared December 23, 2005 by Governor Murkowski: Beginning on November 18, 2005 and continuing through November 26,

2005, a strong winter storm with high winds and record rainfall occurred in the City/Borough of Juneau, the City/Borough of Haines, the City/Borough of Sitka, the City of Pelican, the City of Hoonah, and the **City of Craig**, which resulted in widespread coastal flooding, landslides, and severe damage and threat to life and property, with the potential for further damage. The total estimated amount of assistance was approximately $1.87 million. This included the following: Individual Assistance totaling $500K for 52 applicants and Public Assistance totaling $1.1 million for 14 applicants and 31 PWs. There was no hazard mitigation (2016 State of Alaska Disaster Cost Index).

December 27-29, 2006: High Wind. A 958 MB storm center moved into the Western Gulf on the afternoon of Wed. Dec. 27th with strong warm advection over all of SE Alaska. Strong surface pressure gradients formed along the outer coast. Cold air remained in a fairly deep layer over the Northern Panhandle which finally warmed on Friday, Dec 29th. This overrunning caused heavy snow in the higher elevations around the Northern end of Lynn Canal and into White Pass. A 944 MB Storm Force Low 200 NM west of the Queen Charlotte moved into the Eastern Gulf Friday afternoon Dec. 29th then recurved back to Middleton Island while weakening. Craig reported gusts of 69 MPH that occurred overnight prior to 0800 AKST 12/28. Surface analyses indicate that extreme surface pressure gradients developed across the area during the night of 12/27 and persisted through the morning of 12/29. Craig estimated gusts to 100 MPH on the afternoon of the 28th. The strong wind lasted until 5 AM 12/29.

January 14, 2014: Flood. A strong and very moist weather front with a tropical connection moved across Southeast Alaska January 13 and 14. An anomalous ridge of high-pressure set up over the eastern Pacific and western North America during the first week of January. The blocking ridge was oriented in a way that it steered a large plume of high precipitable water values northward. The associated atmospheric river moved into the eastern Gulf of Alaska from the North Pacific and then over the panhandle on January 14. The front produced strong wind gusts over the area as the front moved over the area. The combination of the wind and very wet soil conditions from almost 35 straight days of rain produced mud-slides over Prince of Wales Island, Ketchikan, and Sitka areas near steep terrain and/or clear-cut areas. It rained 17.34 inches over a 37-day period on Prince of Wales Island. There was just two days over that period of time that no rain fell for an average of just under one half of an inch of rain per day. The strong weather front that moved over the area on January 14 produced 2.42 inches and broke the daily rainfall record, the previous record was 1.47 inches from 2007. All of the record rainfall that day transferred into runoff and produced a record stream flow stage along Staney Creek of 17.55 feet which broke the previous record of 17.20 from 1993. There was moderate flooding from the rainfall along local streams and rivers with some impacts to homes. The very moist antecedent soil conditions, high rain rates along with strong wind gusts of 50 mph triggered land/mudslides near steep terrain and logging areas. These slides knocked down power lines and blocked roads. One big mud slide in particular blocked the main highway between Hollis and **Craig** for a period of time.

October 2-3, 2014: High Wind. A complex storm force low-pressure system developed in the NE Pacific on Thursday, Oct 2. During that afternoon, the main center

deepened to 973 Mb SSE of Kodiak Island while a triple point formed just west of Dixon Entrance. The triple point rapidly moved northward past the westward coast of Prince of Wales Island, causing near hurricane force damaging wind during the early evening. The front moved inland later that evening with the wind rapidly diminishing. Damage was observed in the town of **Craig**. From a trained spotter: 1 roof blew off neighbor's trailer home, a tree top broke off on the ballfield trail, and a home built within 8 years lost roof eaves and suffered roof damage. Craig emergency manager reported 2 residential roofs were blown off, 3 trees down, and 1 boat blown off of its trailer.

In Figure 5 below, severe weather events are defined as follows: High Winds (HW), Heavy Snow (Hvy Snow), Flood (FL), Frost/Freeze, Heavy Rain (Hvy Rain), Coastal Flood (Coastal FL) and Winter Storm (WS).

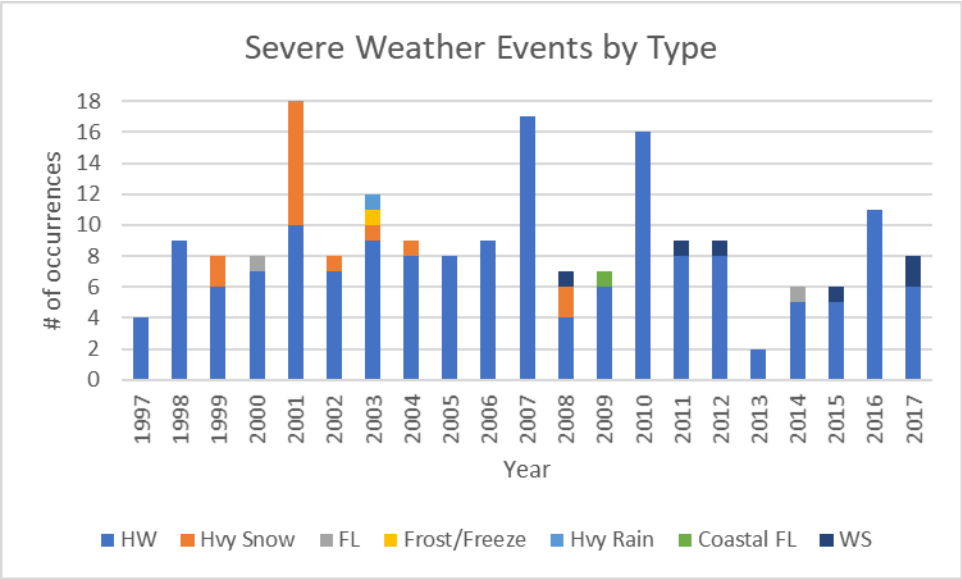


Figure 5. Severe Weather Events by Type

The following tables from the Western Regional Climate Center illustrate historic temperature and precipitation in Craig.

Table 15. Craig Temperature Summary

CRAIG, ALASKA

Period of Record General Climate Summary - Temperature

Station: (502227) CRAIG															
From Year=1949 To Year=2012															
	Monthly Averages			Daily Extremes				Monthly Extremes				Max. Temp.		Min. Temp.	
	Max.	Min.	Mean	High	Date	Low	Date	Highest Mean	Year	Lowest Mean	Year	>= 90 F	<= 32 F	<= 32 F	<= 0 F
	F	F	F	F	dd/yyyy or yyyymmdd	F	dd/yyyy or yyyymmdd	F	-	F	-	# Days	# Days	# Days	# Days
January	39.4	29.6	34.5	60	19/2009	2	01/1950	42.6	2003	20.5	1950	0.0	5.4	16.5	0.0
February	41.4	31.4	36.4	59	05/1995	13	23/1994	41.3	2010	33.6	1951	0.0	0.4	14.5	0.0
March	43.1	31.9	37.5	63	28/1994	4	05/1951	42.4	2005	32.7	1951	0.0	1.0	15.2	0.0
April	49.3	36.2	42.6	74	25/2005	23	09/1950	46.2	2004	40.3	1950	0.0	0.0	5.6	0.0
May	55.0	41.6	48.3	77	25/2008	25	29/1953	53.1	2005	44.9	1999	0.0	0.0	0.8	0.0
June	60.1	47.5	53.8	90	21/2004	30	03/1953	57.9	2004	50.1	2008	0.1	0.0	0.1	0.0
July	62.5	51.2	56.9	79	12/1952	41	21/1953	60.0	2004	54.3	2008	0.0	0.0	0.0	0.0
August	63.5	51.4	57.4	84	10/2004	33	17/1953	60.5	2005	54.3	1953	0.0	0.0	0.0	0.0
September	59.2	48.3	53.8	75	30/2003	32	25/1951	55.2	2010	52.3	1999	0.0	0.0	0.1	0.0
October	51.8	42.0	46.9	73	24/1995	26	24/1951	49.9	2003	45.5	2007	0.0	0.0	1.9	0.0
November	44.6	35.7	40.1	59	30/2002	11	26/2006	46.9	2002	32.9	2006	0.0	0.7	8.6	0.0
December	41.7	33.0	37.4	55	31/2001	2	31/1949	41.6	2005	30.7	1949	0.0	1.9	12.4	0.0
Annual	51.0	40.0	45.5	90	20040621	2	19491231	46.7	2010	45.0	2011	0.1	9.4	75.6	0.0
Winter	40.8	31.3	36.1	60	20090119	2	19491231	39.0	2010	28.7	1950	0.0	7.7	43.5	0.0
Spring	49.1	36.6	42.8	77	20080525	4	19510305	47.2	2005	41.3	1951	0.0	1.0	21.5	0.0
Summer	62.0	50.0	56.0	90	20040621	30	19530603	58.3	2005	53.7	2008	0.1	0.0	0.1	0.0
Fall	51.9	42.0	46.9	75	20030930	11	20061126	49.9	2002	44.8	2006	0.0	0.7	10.5	0.0

Table updated on Oct 31, 2012

Table 16. Craig Precipitation Summary

CRAIG, ALASKA

Period of Record General Climate Summary - Precipitation

Station:(502227) CRAIG														
From Year=1949 To Year=2012														
	Precipitation											Total Snowfall		
	Mean	High	Year	Low	Year	1 Day Max.		>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean	High	Year
	in.	in.	-	in.	-	in.	dd/yyyy or yyyymmdd	# Days	# Days	# Days	# Days	in.	in.	-
January	8.24	16.31	1993	0.40	1950	3.95	18/1993	20	15	6	2	5.1	11.6	1993
February	8.40	15.55	1993	3.69	2010	4.90	26/1993	17	13	6	2	6.3	44.0	1950
March	8.07	13.47	2008	2.87	2006	2.90	12/1994	21	16	5	2	5.8	22.6	2007
April	7.41	12.81	1950	1.25	2002	7.56	16/1953	19	14	5	2	0.4	3.8	2010
May	5.38	12.70	1999	1.70	2004	3.35	03/1992	18	12	4	1	0.0	0.0	1950
June	3.05	5.30	2010	1.34	2007	1.30	28/2009	15	8	2	0	0.0	0.0	1950
July	4.13	7.53	2005	1.22	2009	1.60	10/2007	18	11	2	0	0.0	0.0	1950
August	6.02	12.35	2011	2.54	1951	3.65	28/1999	18	12	4	1	0.0	0.0	1950
September	10.17	18.16	2011	3.54	2008	3.20	22/1949	20	16	8	3	0.0	0.0	1949
October	13.06	20.97	1949	6.86	2012	8.96	16/1952	23	18	9	3	0.0	0.0	1949
November	12.29	22.30	1991	5.63	1950	7.34	13/1952	22	19	9	3	1.9	11.4	2011
December	10.80	17.67	1993	3.06	2009	2.63	19/2003	22	18	8	3	3.0	10.0	2001
Annual	97.04	114.41	1994	84.01	2009	8.96	19521016	233	173	68	23	22.5	26.2	2009
Winter	27.45	42.74	1993	14.26	2010	4.90	19930226	60	46	21	7	14.4	29.3	2008
Spring	20.86	30.42	1953	8.01	2002	7.56	19530416	57	42	14	4	6.2	22.6	2007
Summer	13.20	19.31	2011	10.12	1992	3.65	19990828	51	32	8	2	0.0	0.0	1950
Fall	35.52	50.55	1994	24.72	1951	8.96	19521016	65	53	26	9	1.9	9.3	2006

Table updated on Oct 31, 2012

Western Regional Climate Center, wrcc@dri.edu

Severe Weather Mitigation Goals and Projects

Goal 1. Mitigate the effects of extreme weather by instituting programs that provide early warning and preparation.

Goal 2. Educate people about the dangers of extreme weather and how to prepare.

Goal 3. Develop practical measures to warn in the event of a severe weather event.

Project SW-1. Research and consider instituting the National Weather Service program of *"Storm Ready"*. (Goals 1, 2, 3)

Storm Ready is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather—from tornadoes to tsunamis. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.

To be officially Storm Ready, a community must:

1. Establish a 24-hour warning point and emergency operations center.
2. Have more than one way to receive severe weather forecasts and warnings and to alert the public.
3. Create a system that monitors local weather conditions.
4. Promote the importance of public readiness through community seminars.
5. Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.
6. Demonstrate a capability to disseminate warnings.

Specific Storm Ready guidelines, examples, and applications also may be found on the Internet at: www.nws.noaa.gov/stormready

2017 Update: This project has been implemented and completed.

Project SW-2. Conduct special awareness activities, such as, Winter Awareness Week, Flood Awareness Week. (Goals 1, 2, 3)

2017 Update: Craig has conducted tsunami awareness activities but has not conducted winter or flood awareness activities.

Project SW-3. Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability. (Goals 1, 2, 3)

2017 Update: Schools have weather radios; severe weather advisories from NOAA are received via Twitter feed; also receive direct email of severe weather from weather service.

Project SW-4. Developers are provided with seismic, wind, and snow load requirements during the City's building permitting process. Code requires weather-resistant building construction materials and practices. (Goals 1, 2, 3)

2017 Update: This program has been implemented and is on-going.

Project SW-5. Along St Nicholas Road, culverts are needed. Some culverts are undersized, and some locations do not have culverts. An engineer should conduct a hydrology study and install 10-20 under road culverts accordingly to prevent over road water flow during rain events.

This project was identified in 2017.

Section 5. Wildland Fire

Hazard Description

Wildland fires occur in every state in the country, and Alaska is no exception. Each year, between 600 and 800 wildland fires, mostly between March and October, burn across Alaska causing extensive damage.

Fire is recognized as a critical feature of the natural history of many ecosystems. It is essential to maintain the biodiversity and long-term ecological health of the land. In Alaska, the natural fire regime is characterized by a return interval of 50 to 200 years, depending on the vegetation type, topography, and location. The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the fire management planning process, and the full range of fire management activities is exercised in Alaska to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social consequences on firefighter and public safety and welfare, natural and cultural resources threatened, and the other values to be protected dictate the appropriate management response to the fire. Firefighter and public safety is always the first and overriding priority for all fire management activities.

Fires can be divided into the following categories:

Structure fires – originate in and burn a building, shelter, or other structure.

Prescribed fires - ignited under predetermined conditions to meet specific objectives, to mitigate risks to people and their communities, and/or to restore and maintain healthy, diverse ecological systems.

Wildland fire - any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Use - a wildland fire functioning in its natural ecological role and fulfilling land management objectives.

Wildland-Urban Interface Fires - fires that burn within the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. The potential exists in areas of wildland-urban interface for extremely dangerous and complex fire conditions, which pose a tremendous threat to public and firefighter safety.

Fuel, weather, and topography influence wildland fire behavior. Wildland fire behavior can be erratic and extreme, causing firewhirls and firestorms that can endanger the lives of the firefighters trying to suppress the blaze. Fuel determines how much energy the fire releases, how quickly the fire spreads, and how much effort is needed to contain the fire. Weather is the most variable factor. Temperature and humidity also affect fire behavior. High temperatures and low humidity encourage fire activity while low

temperatures and high humidity help retard fire behavior. Wind affects the speed and direction of a fire. Topography directs the movement of air, which can also affect fire behavior. When the terrain funnels air, like what happens in a canyon, it can lead to faster spreading. Fire can also travel up slope quicker than it goes down.

Location

The hazard of a wildland fire would impact Craig. Many structures within the community are situated very close together.

Extent

A structural fire event could result in a **limited** situation in Craig. Injuries and/or illness could result from excessive smoke, shutdown critical facilities, and damage property.

Impact

Craig residents must be fairly self-reliant because of the community's remote location. A fire event could leave community residents homeless and damage critical structures. Fires could also cause a severe air quality issue as the result of smoke.

Probability

The following map from the 2013 State of Alaska *All-Hazard Risk Mitigation Plan* depicts Craig as being in an area where wildland fire hazards are present but at an unknown probability.

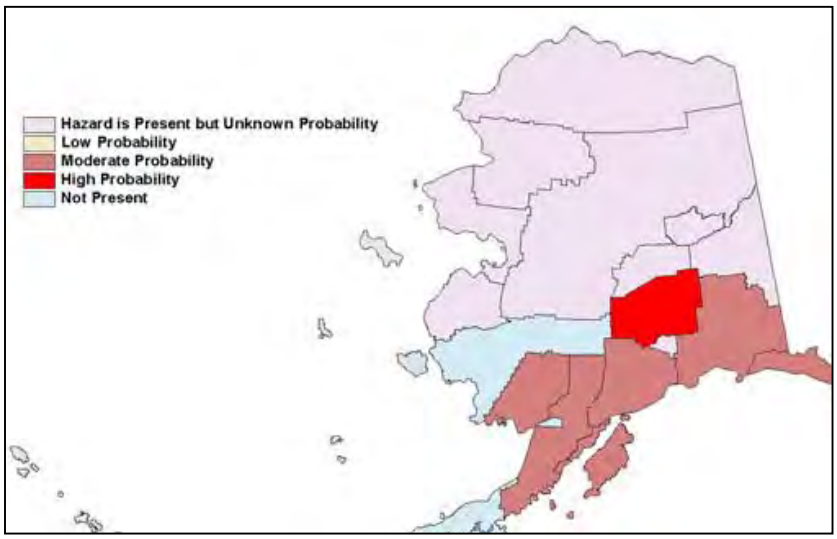


Figure 6. Alaska All-Hazards Mitigation Plan - Fire Risk Map

Previous Occurrences

Craig is located in an area where the wildland fire hazard is present but its probability is unknown. To date, there have been two wildland fires with estimated loss greater than 5 acres since 1939 occurring within 10 miles of the City of Craig.

Wildland Fire Mitigation Goals and Projects

Wildland Fire Goals

Goal 1: Establish building regulations to mitigate against fire damage.

Goal 2: Conduct outreach activities to encourage the use of Fire Wise development techniques.

Projects

WF1: Promote Fire Wise building design, siting, and materials for construction.

This project was identified in 2017.

WF2: Enhance public awareness of potential risk to life and personal property. Encourage mitigation measures in the immediate vicinity of their property.

This project was identified in 2017.

Section 6. Climate Change

Hazard Description

For this MHMP, climate change refers to the long-term variation in atmospheric composition and weather patterns on a global scale. Global climate change may occur gradually due to small variations or rapidly due to large catastrophic forces. Greenhouse gasses, especially carbon dioxide (CO_2) and methane (CH_4), are commonly regarded as the most significant factors influencing the Earth's current climate.

Significant atmospheric variations may also be influenced by more than one event, for instance, an asteroid impact and a major eruption over a longer time period. For scientists studying climate change, both hazards imply different time periods. Therefore, the time period estimates for previous climate change events tend to vary and cannot be accurately applied to current predictive climate change models, which now must account for human activity. This is significant because hazard mitigation planning relies greatly upon the historical record.

Location

Climate change is a global event. Therefore, the entire City of Craig is vulnerable to climate change.

Extent

Climate change affects water acidity, atmospheric composition, precipitation, weather patterns, and temperatures.

Local Impact

Climate change has the potential to aggravate natural disasters along the coastline, particularly flooding and permafrost degradation. Climate change will continue to exacerbate the issue.

Global Impact

The major effect of climate change is the abrupt decline of the earth's bio-diversity and population of organisms.

Probability

Given the current observed changes in the atmosphere, and the criteria identified in Table 11, it is "credible" a disaster event attributed to climate change will occur in the next ten years as the probability is less than or equal to 10% likely per year.

Previous Occurrences

Various events have occurred in Craig that point to climate change. These events, per Craig residents, are:

- Fishermen are seeing warm water fish;
- No changing climate patterns;
- Residents are seeing Sturling's black bird with yellow beak which has not been seen in the area before;
- Residents are seeing doves in Craig and as far north as Juneau and Sitka;
- Experiencing dryer winters; and
- Yellow cedar trees are dying due to lack of winter snowpack, as reported by foresters; yellow cedars need the snow insulation to protect the root system from freezing.

Section 7. Hazards not present in Craig

Volcanoes

The responsibility for hazard identification and assessment for the active volcanic Centers of Alaska falls to the Alaska Volcano Observatory and its constituent organizations (USGS, DGGS, and UAF).

The Alaska Volcano Observatory (AVO), which is a cooperative program of the U.S. Geological Survey (USGS), Alaska Division of Geological & Geophysical Surveys (DGGS), and the University of Alaska Fairbanks Geophysical Institute (UAF/GI), monitor the seismic activity at 23 of Alaska's 41 active volcanoes in real time. In addition, satellite images of all Alaskan and Russian volcanoes are analyzed daily for evidence of ash plumes and elevated surface temperatures. Russian volcanoes are also a concern to Alaska as prevailing winds could carry large ash plumes from Kamchatka into Alaskan air space. AVO also researches the individual history of Alaska's active volcanoes and produces hazard assessment maps for each center.

The AVO identifies the closest active volcano to Craig at being over 400 miles away. http://www.avo.alaska.edu/

Snow Avalanche

The topography of the Craig area does not create a snow avalanche risk within the city limits.

Floods/Erosion

The City of Craig does not participate in the National Flood Insurance Program and does not consider either flooding or erosion as a hazard present in the community. There are no repetitive loss properties identified in the community of Craig.

Chapter 5: Mitigation Strategy

Benefit - Cost Review

This chapter of the plan outlines Craig's overall strategy to reduce its vulnerability to the effects of the hazards studied. Currently, the planning effort is limited to the hazards determined to be of the most concern: tsunami, ground failure (landslide), earthquakes, severe weather, wildland fire, climate change; and technological hazards. The mitigation strategy will be regularly updated as additional hazard information is added, and new information becomes available.

The projects listed in Table 12, Benefit and Costs Listing, were prioritized using a "listing of benefits and costs review method" as described in the FEMA *How-To-Guide Benefit-Cost Review in Mitigation Planning* (FEMA 386-5).

Due to monetary as well as other limitations, it is often impossible to implement all mitigation actions. Therefore, the most cost-effective actions for implementation will be pursued for funding first, not only to use resources efficiently, but also to make a realistic start toward mitigating risks.

The City of Craig considered the following factors in prioritizing the mitigation projects. Due to the dollar value associated with both life-safety and critical facilities, the prioritization strategy represents a special emphasis on benefit-cost review because the factors of life-safety and critical facilities steered the prioritization towards projects with likely good benefit-cost ratios.

1. Extent to which benefits are maximized when compared to the costs of the projects, the Benefit Cost Ratio must be 1.0 or greater.

2. Extent the project reduces risk to life-safety.

3. Project protects critical facilities or critical City functionality.

4. Hazard probability.

5.. Hazard severity.

Some of the criteria that were reviewed in developing the Benefit and Cost Listing Table are listed below.

1. Vulnerability before and after mitigation

    - Number of people affected by the hazard, areawide, or specific properties.
    - Areas affected (acreage) by the hazard

- Number of properties affected by the hazard
- Loss of use
- Loss of life (number of people)
- Injury (number of people)

2. List of Benefits

- Risk reduction (immediate or medium time frame)
- Other community goals or objectives achieved
- Easy to implement
- Funding available
- Politically or socially acceptable

3. Costs

- Construction cost
- Programming cost
- Long time frame to implement
- Public or political opposition
- Adverse environmental effects

This method supports the principle of benefit-cost review by using a process that demonstrates a special emphasis on maximization of benefits over costs. Projects that demonstrate benefits over costs and that can start immediately were given the highest priority. Projects that the costs somewhat exceed immediate benefit and that can start within five years (or before the next update) were given a description of medium priority, with a timeframe of one to five years. Projects that are very costly without known benefits, probably cannot be pursued during this plan cycle, but are important to keep as an action were given the lowest priority and designated as long term.

The plan is subject to final Craig City Council approval after pre-approval is obtained by DHS&EM.

After the MHMP Update has been approved, the projects must be evaluated using a Benefit-Cost Analysis (BCA) during the funding cycle for disaster mitigation funds from DHS&EM and FEMA.

A description of the BCA process follows, briefly, BCA is the method by which the future benefits of a mitigation project are determined and compared to its cost. The result is a Benefit-Cost Ratio, which is derived from a project's total net benefits divided by its total cost. The BCR is a numerical expression of the cost-effectiveness of a project. Composite BCRs of 1.0 or greater have more benefits than costs, and are, therefore, cost-effective.

Benefit-Cost Review vs. Benefit-Cost Analysis (FEMA 386-5) states in part:
Benefit-Cost Review for mitigation planning differs from the benefit cost analysis (BCA) used for specific projects. BCA is a method for determining the potential positive effects of a mitigation action and comparing them to the cost of the action. To assess and demonstrate the cost-effectiveness of mitigation actions, FEMA has developed a suite of BCA software, including hazard-specific modules. The analysis determines whether a mitigation project is technically cost-effective. The principle behind the BCA is that the benefit of an action is a reduction in future damages.

DMA 2000 does not require hazard mitigation plans to include BCAs for specific projects, but does require that a BCR be conducted in prioritizing projects.

Benefit-Cost Analysis

The following section is reproduced from a document prepared by FEMA, which demonstrates on how to perform a Benefit –Cost Analysis. The complete guideline document, a benefit-cost analysis document and benefit-cost analysis technical assistance is available online https://www.fema.gov/benefit-cost-analysis.

Facilitating BCA

Although the preparation of a BCA is a technical process, FEMA has developed software, written materials, and training that simplifies the process of preparing BCAs. FEMA has a suite of BCA software for a range of major natural hazards: earthquake, fire (wildland/urban interface fires), flood (riverine, coastal A-Zone, Coastal V-Zone), Hurricane Wind (and Typhoon), and Tornado.

Sometimes there is not enough technical data available to use the BCA software mentioned above. When this happens, or for other common, smaller-scale hazards or more localized hazards, BCAs can be done with the Frequency Damage Method (i.e., the Riverine Limited Data module), which is applicable to any natural hazard as long as a relationship can be established between how often natural hazard events occur and how much damage and losses occur as a result of the event. This approach can be used for coastal storms, windstorms, freezing, mud/landslides, severe ice storms, snow, tsunami, and volcano hazards.

Applicants and Sub-Applicants must use FEMA-approved methodologies and software to demonstrate the cost-effectiveness of their projects. This will ensure that the calculations and methods are standardized, facilitating the evaluation process. Alternative BCA software may also be used, but only if the FEMA Regional Office and FEMA Headquarters approve the software.

To assist Applicants and Sub-applicants, FEMA has prepared the *FEMA Mitigation BCA Toolkit* CD. This CD includes all of the FEMA BCA software, technical manuals, BC training courses, Data-Documentation Templates, and other supporting documentation and guidance.

The *Mitigation BCA Toolkit* CD is available free from FEMA Regional Offices or via the BC Helpline (at bchelpline@dhs.gov or toll-free number at (866) 222-3580.

The BC Helpline is also available to provide BCA software, technical manuals, and other BCA reference materials as well as to provide technical support for BCA.

For further technical assistance, Applicants or Sub-Applicants may contact their State Mitigation Office, the FEMA Regional Office, or the BC Helpline. FEMA and the BC Helpline provide technical assistance regarding the preparation of a BCA.

Eligible Projects for PDM and HMGP Funding

To be eligible for funding under the HMGP, proposed measures must meet the minimum project criteria under 44 CFR 206.434(b).

These criteria are designed to ensure that the most appropriate projects are selected for funding.

Projects may be of any nature that will result in protection of public or private property from natural hazards. Some types of projects that **may be eligible include**:

- Acquisition of hazard prone property and conversion to open space;
- Retrofitting existing buildings and facilities;
- Elevation of flood prone structures;
- Vegetative management/soil stabilization;
- Infrastructure protection measures;
- Stormwater management;
- Minor structural flood control projects; and
- Post-disaster code enforcement activities.

The following types of projects **are not** eligible under the HMGP:

- Retrofitting places of worship (or other projects that solely benefit religious organizations); and
- Projects in progress.

There are five minimum criteria that all projects must meet in order to be considered for funding:

- Conforms with the State Hazard Mitigation Plan;
- Provides beneficial impact upon the designated disaster area;
- Conforms with environmental laws and regulations;

- Solves a problem independently or constitutes a functional portion of a solution; and
- Is cost-effective.

Benefit – Costs Review Listing Table

Table 17. Benefit Cost Review Listing

* Priorities: High = Clearly a life/safety project, or benefits clearly exceed the cost or can be implemented 0 – 1 year.
Medium = More study required to designate as a life/safety project, or benefits may exceed the cost, or can be implemented in 1 – 5 years.
Low = More study required to designate as a life/safety project, or not known if benefits exceed the costs, or long-term project, implementation will not occur for over 5 years.

Mitigation Projects	Benefits (pros)	Costs (cons)	Priority	Status in 2017
Tsunami (T)				
T-1. Inundation Mapping	FEMA, PDM, HMGP and State DCRA funding available. NOAA/NWS facilitated project. 1 – 5 year project.	Expensive, at least $100,000	Medium	Completed. Maps will be published in 2018. This project can be deleted in the next update.
T-2. Update Craig Emergency Response Plan	Life/Safety issue Risk reduction Benefit to entire community Inexpensive State assistance available 1 – 5 years, or as needed.	Staff time	Medium	Currently working on new plan. This project will be completed in 2018.
T-3. Tsunami Ready Certification	Life/Safety issue Risk reduction Benefit to entire community State assistance available 1 – 5 years, or as needed.	Staff time	Medium	This certification has been obtained. This project can be deleted in the next plan update.
T-4. Tsunami Warning Systems	Life/Safety issue Risk reduction Benefit to entire community State assistance available 1 – 5 years, or as needed.	Staff time	Medium	Two sirens have been installed. Schools have radios and marine bands. This project can be deleted in the next plan update.

T-5. Evacuation maps and plans	Life/Safety issue Risk reduction Benefit to entire community State assistance available 1 – 5 years, or as needed.	Staff time	Medium	The City is developing evacuation maps/plans and will finalize them after the inundation maps are published in 2018.
T-6. EOP Exercises	Life/Safety issue Risk reduction Benefit to entire community State assistance available 1 – 5 years, or as needed.	Staff time	Medium	Ongoing. Conduct 3-4 per year
Ground Failure (G/F)				
F-1. Continued Maintenance and Replacement of Generators at Water Treatment Plan, as needed.	Life/Safety issue/Risk reduction Benefit to entire community Expensive	Staff time to apply for grant	High	Wastewater treatment plant backup generator set outside permit; EPA Clean Water Discharge Permit conditions would not be met if power was out for 24 hours. For 24 hours, raw sewage would be discharged to the ocean. A project to mitigate this hazard is listed in the earthquake section of this table.
G/F-2. Continued public education.	Life/Safety issue/Risk reduction Benefit to entire community Federal and State assistance available	Mapped landslide zones do not exist at this time.	High	
G/F-3. Conduct studies of unstable soils	Life/Safety issue/Risk reduction Benefit to entire community Federal and State assistance available	Mapped landslide zones do not exist at this time. 5+ years to implement	Low	Ask in February if landslide zones have been mapped?

Earthquake (E)				
E-1. If funding is available, perform an engineering assessment of the earthquake vulnerability.	Life/Safety issue/Risk reduction Benefit to entire community Inexpensive State assistance available Could be an annual event	Staff time	High	Not completed due to lack of funding
E-2. Identify buildings and facilities that must be able to remain operable during and following an earthquake event.	Life/Safety issue/Risk reduction Benefit to entire community Inexpensive State assistance available Could be an annual event	Staff time	High	Not completed due to lack of funding
E-3. Contract a structural engineering firm to assess the identified bldgs and facilities.	Benefit to entire community Risk reduction	Feasibility and need analysis needed. 1 – 5 years	Medium	Not completed due to lack of funding
Project E-4. Three road bridges with water lines connected under them and one additional water line bridge connect the water source to the community and are vulnerable to earthquakes. Conduct a structural seismic assessment to determine if, in a major earthquake, the only community water main would be protected. Based on the engineering assessment, add seismic retrofits to the bridges.	Benefit to entire community Risk reduction Access to drinking water is critical to life	Feasibility and need analysis needed. 1 – 5 years	High	New project identified in 2017

Project E-5. With only one water storage tank (800,000 gallons) located south of the community, 80% of the population would lose drinking water if the water main was damaged at the two earthen fill locations. To mitigate this issue, construct a storage tank within the west area of the community which would supply water to 35%, and construct a storage tank within the east area of the community which would supply water to an additional 45%.	Benefit to entire community Risk reduction Access to drinking water is critical to life	Feasibility and need analysis needed. 1 – 5 years	High	New project identified in 2017
Project E-6. The Craig High School is the community's primary shelter and is vulnerable to earthquakes. Install a water storage tank to serve the northern area of the community.	Benefit to entire community Risk reduction Access to drinking water is critical to life	Feasibility and need analysis needed. 1 – 5 years	High	New project identified in 2017
Project E-7. A secondary water source is needed in the event that the primary treatment plant or the dam at the water source is damaged. The prime location would be the old spring which is a subterranean water source that has less stringent treatment requirements before public use.	Benefit to entire community Risk reduction Access to drinking water is critical to life	Feasibility and need analysis needed. 1 – 5 years	High	New project identified in 2017

Project E-8. The wastewater treatment plant and four community shelters need emergency power backup. This project has three components.	Benefit to entire community Risk reduction Access to heat is critical to life	Feasibility and need analysis needed. 1 – 5 years	High	New project identified in 2017
Project E-9. From an emergency response perspective, the Klawock Airport runway is 5,000-feet long and 100-feet wide and is capable of having a Hercules C-130 aircraft land to delivery relief supplies. However, there is only 2-inches of asphalt on the airport apron. The apron cannot handle the load. This is the only land-based airport on Prince of Wales Island. Add additional asphalt to the apron to sustain the load of a Hercules C-130 aircraft in the event of an emergency.	Benefit to entire community Risk reduction Emergency access is critical to life	Feasibility and need analysis needed. 1 – 5 years	High	New project identified in 2017

Severe Weather (S/W)				
S/W-1. Research and consider instituting the National Weather Service program of *"Storm Ready"*.	Life/Safety issue Risk reduction Benefit to entire community Inexpensive State assistance available Could be implemented annually	Staff time	High	Completed
S/W-2. Conduct special awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc.	Life/Safety issue Risk reduction Benefit to entire community Inexpensive State assistance available Could be an annual event	Staff time	High	Completed (but for tsunamis, not winter weather or floods)
S/W-3. Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability	Life/Safety issue Risk reduction Benefit to entire community Inexpensive State assistance available Could be an annual event	Staff time	High	Completed
S/W-4. Encourage weather resistant building construction materials and practices.	Risk and damage reduction. Benefit to entire community.	Would require ordinance change. Potential for increased staff time. Research into feasibility necessary. Political and public support not determined. 1 – 5 year implementation	Medium	Completed and ongoing as part of City's building permit process.

Severe Weather (S/W)				
S/W-5. Along St Nicholas Road, culverts are needed. Some culverts are undersized, and some locations do not have culverts. An engineer should conduct a hydrology study and install 10-20 under road culverts accordingly to prevent over road water flow during rain events.	Risk and damage reduction. Benefit to entire community.	Would require engineering contractor.	Medium	New project identified in 2017
Wildland Fire (WF)				
WF1: Promote Fire Wise building design, siting, and materials for construction.	Risk and damage reduction. Benefit to entire community.	Staff Time.	Medium	New project identified in 2017
WF2: Enhance public awareness of potential risk to life and personal property. Encourage mitigation measures in the immediate vicinity of their property.	Risk and damage reduction. Benefit to entire community.	Staff Time.	Medium	New project identified in 2017

Mitigation Project Plan Table

Table 18. Mitigation Project Plan

Mitigation Projects	Responsible Agency	Cost	Funding Sources	Estimated Timeframe	Annual Review
Tsunami (T)					
T-1. Inundation Mapping	City DHS&EM NOAA/NWS	>$100,000	State Funds NOAA/NWS	Completed.	
T-2. Update Craig Emergency Response Plan	City DHS&EM	>$10,000	State Federal DHS City	Will be completed in 2018.	
T-3. Seek TsunamiReady Cert.	City DHS&EM			Completed.	
T-4. Warning Radio Systems	NOAA	>$50,000	State Funds NOAA/NWS	Completed.	
T-5. Evacuation maps and plans	DHS&EM City	>$10,000	State City	Will be completed in 2018.	
T-6. EOP Exercises	City DHS&EM	>$10,000	State City	As needed	
Ground Failure (GF)					
GF-1. Continued Maintenance and Replacement of Generators at Water Treatment Plan, as needed.	City DHS&EM	>$100,000	PDM	Implement E-8 project under Earthquakes	
G/F-2. Continue to educate public about ground failure hazards.	City	Staff Time	City Budget	Next year	
G/F-3. Conduct studies of unstable soils	City	>$10,000	City Budget State Funds	>1 year	

Earthquake (E)					
E-1. If funding is available, perform an engineering assessment of the earthquake vulnerability of each identified critical infrastructure owned by the City of Craig City.	City DHS&EM	To be determined	State Grants	>1 year	New project identified in 2017
E-2. Identify buildings and facilities that must be able to remain operable during and following an earthquake event.	City DHS&EM DCRA	Staff Time	State Grants	>1 year	New project identified in 2017
E-3. Contract a structural engineering firm to assess the identified buildings and facilities.	City DHS&EM	>$50,000	PDM	>5 years	New project identified in 2017
E-4. Conduct a structural seismic assessment to determine if, in a major earthquake, the only community water main would be protected. Based on the engineering assessment, add seismic retrofits to the bridges.	City DHS&EM	>$50,000	PDM	>5 years	New project identified in 2017
E-5. Construct a storage tank within the west area of the community which would supply water to 35%, and construct a storage tank within the east area of the community which would supply water to an additional 45%.	City DHS&EM	>$900,000	PDM	>5 years	New project identified in 2017
E-6. Install a water storage tank to serve the northern area of the community.	City DHS&EM	>$900,000	PDM	>5 years	New project identified in 2017

E-7. A secondary water source is needed in the event that the primary treatment plant or the dam at the water source is damaged. The prime location would be the old spring which is a subterranean water source that has less stringent treatment requirements before public use.	City DHS&EM	>$300,000	PDM	>5 years	New project identified in 2017
E-8. The wastewater treatment plant and four community shelters need emergency power backup. This project has three components.	City DHS&EM	>$50,000	PDM	>5 years	New project identified in 2017
E-9. From an emergency response perspective, the Klawock Airport runway is 5,000-feet long and 100-feet wide and is capable of having a Hercules C-130 aircraft land to delivery relief supplies. However, there is only 2-inches of asphalt on the airport apron. The apron cannot handle the load. This is the only land-based airport on Prince of Wales Island. Add additional asphalt to the apron to sustain the load of a Hercules C-130 aircraft in the event of an emergency.	City DHS&EM	>$900,000	PDM	>5 years	New project identified in 2017

Severe Weather (SW)					
SW-1. Research and consider instituting the National Weather Service program of *"Storm Ready"*.	City	Staff Time	City	Completed	
SW-2. Conduct special awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc.	City DCRA DHS&EM	Staff Time	City DCRA DHS&EM	<1 year	
SW-3. Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability	City	Staff Time	NOAA	Ongoing	
SW-4. Encourage weather resistant building construction materials and practices.	City	Staff Time	City	<1 year	Completed and ongoing as part of City's building permit process.
SW-5. Along St Nicholas Road, culverts are needed. Some culverts are undersized, and some locations do not have culverts. An engineer should conduct a hydrology study and install 10-20 under road culverts accordingly to prevent over road water flow during rain events.	City	Contract Engineering Firm	City	<1 year	New project identified in 2017

Wildland Fire					
WF1: Promote Fire Wise building design, siting, and materials for construction.	City	Staff Time	City	<1 year	New project identified in 2017
WF2: Enhance public awareness of potential risk to life and personal property. Encourage mitigation measures in the immediate vicinity of their property.	City	Staff Time	City	<1 year	New project identified in 2017

* PDM Pre-Disaster Mitigation
** HMGP Hazard Mitigation Grant Program
***FMA Flood Mitigation Assistance (Program)

Glossary of Terms

A-Zones

Type of zone found on all Flood Hazard Boundary Maps (FHBMs), Flood Insurance Rate Maps (FIRMs), and Flood Boundary and Floodway Maps (FBFMs). An A-Zone Area is defined as an area of a potential 100-year flood.

Acquisition

Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or outright purchase of property.

Asset

Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.

Base Flood

A term used in the National Flood Insurance Program to indicate the minimum size of a flood. This information is used by a community as a basis for its floodplain management regulations. It is the level of a flood, which has a one-percent chance of occurring in any given year. Also known as a 100-year flood elevation or one-percent chance flood.

Base Flood Elevation (BFE)

The elevation for which there is a one-percent chance in any given year that floods water levels will equal or exceed it. The BFE is determined by statistical analysis for each local area and designated on the Flood Insurance Rate Maps. It is also known as a 100-year flood elevation.

Base Floodplain

The area that has a one percent chance of flooding (being inundated by flood waters) in any given year.

Building

A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.

Building Code

The regulations adopted by a local governing body setting forth standards for the construction, addition, modification, and repair of buildings and

other structures for the purpose of protecting the health, safety, and general welfare of the public.

Community

Any state, area or political subdivision thereof, or any Indian tribe or tribal entity that has the authority to adopt and enforce statutes for areas within its jurisdiction.

Community Rating System (CRS)

The Community Rating System is a voluntary program that each City or county government can choose to participate. The activities that are undertaken through CRS are awarded points. A community's points can earn people in their community a discount on their flood insurance premiums.

Critical Facility

Facilities that are critical to the health and welfare of the population and that are especially important during and after a hazard event. Critical facilities include, but are not limited to, shelters, hospitals, and fire stations.

Designated Floodway

The channel of a stream and that portion of the adjoining floodplain designated by a regulatory agency to be kept free of further development to provide for unobstructed passage of flood flows.

Development

Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or of equipment or materials.

Digitize

To convert electronically points, lines, and area boundaries shown on maps into x, y coordinates (e.g., latitude and longitude, universal transverse mercator (UTM), or table coordinates) for use in computer

Disaster Mitigation Act (DMA)

DMA 2000 (public Law 106-390) is the latest legislation of 2000 (DMA 2000) to improve the planning process. It was signed into law on October 10, 2000. This new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.

Earthquake

A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the earth's tectonic plates.

Elevation

The raising of a structure to place it above flood waters on an extended support structure.

Emergency Operations Plan

A document that: describes how people and property will be protected in disaster and disaster threat situations; details who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies, and other resources available for use in the disaster; and outlines how all actions will be coordinated.

Erosion

The wearing away of the land surface by running water, wind, ice, or other geological agents.

Federal Disaster Declaration

The formal action by the President to make a State eligible for major disaster or emergency assistance under the Robert T. Stafford Relief and Emergency Assistance Act, Public Law 93-288, as amended. Same meaning as a Presidential Disaster Declaration

Federal Emergency Management Agency (FEMA)

A federal agency created in 1979 to provide a single point of accountability for all federal activities related to hazard mitigation, preparedness, response, and recovery.

Flood

A general and temporary condition of partial or complete inundation of water over normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.

Flood Disaster Assistance

Flood disaster assistance includes development of comprehensive preparedness and recovery plans, program capabilities, and organization of Federal agencies and of State and local governments to mitigate the adverse effects of disastrous floods. It may include maximum hazard reduction, avoidance, and mitigation measures, as well policies, procedures, and eligibility criteria for Federal grant or loan assistance to State and local governments, private organizations, or individuals as the result of the major disaster.

Flood Elevation

Elevation of the water surface above an establish datum (reference mark), e.g. National Geodetic Vertical Datum of 1929, North American Datum of 1988, or Mean Sea Level.

Flood Hazard

Flood Hazard is the potential for inundation and involves the risk of life, health, property, and natural value. Two reference bases are commonly used: (1) For most situations, the Base Flood is that flood which has a one-percent chance of being exceeded in any given year (also known as the 100-year flood); (2) for critical actions, an activity for which a one-percent chance of flooding would be too great, at a minimum the base flood is that flood which has a 0.2 percent chance of being exceeded in any given year (also known as the 500-year flood).

Flood Insurance Rate Map

Flood Insurance Rate Map (FIRM) means an official map of a community, on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community.

Flood Insurance Study

Flood Insurance Study or Flood Elevation Study means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluations and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.

Floodplain

A "floodplain" is the lowland adjacent to a river, lake, or ocean. Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year flood will cover the 10-year floodplain. The 100-year floodplain by the 100-year flood.

Floodplain Management

The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works and floodplain management regulations.

Floodplain Management Regulations

Floodplain Management Regulations means zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as floodplain ordinance, grading ordinance and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof,

which provide standards for the purpose of flood damage prevention and reduction.

Flood Zones

Zones on the Flood Insurance Rate Map (FIRM) in which a Flood Insurance Study has established the risk premium insurance rates.

Flood Zone Symbols

A - Area of special flood hazard without water surface elevations determined.
A1-30 - AE Area of special flood hazard with water surface elevations determined.
AO - Area of special flood hazard having shallow water depths and/or unpredictable flow paths between one and three feet.
A-99 - Area of special flood hazard where enough progress has been made on a protective system, such as dikes, dams, and levees, to consider it complete for insurance rating purposes.
AH - Area of special flood hazard having shallow water depths and/or unpredictable flow paths between one and three feet and with water surface elevations determined.
B - X Area of moderate flood hazard.
C - X Area of minimal hazard.
D - Area of undetermined but possible flood hazard.

Geographic Information System

A computer software application that relates physical features of the earth to a database that can be used for mapping and analysis.

Governing Body

The legislative body of a City that is the assembly of a borough or the council of a city.

Hazard

A source of potential danger or adverse condition. Hazards in the context of this plan will include naturally occurring events such as floods, earthquakes, tsunami, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.

Hazard Event

A specific occurrence of a particular type of hazard.

Hazard Identification

The process of identifying hazards that threaten an area.

Hazard Mitigation

Any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. (44 CFR Subpart M 206.401)

Hazard Mitigation Grant Program

The program authorized under section 404 of the Stafford Act, which may provide funding for mitigation measures identified through the evaluation of natural hazards conducted under §322 of the Disaster Mitigation Act 2000.

Hazard Profile

A description of the physical characteristics of hazards and a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

Hazard and Vulnerability Analysis

The identification and evaluation of all the hazards that potentially threaten a jurisdiction and analyzing them in the context of the jurisdiction to determine the degree of threat that is posed by each.

Mitigate

To cause something to become less harsh or hostile, to make less severe or painful.

Mitigation Plan

A systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the community and includes a description of actions to minimize future vulnerability to hazards.

National Flood Insurance

The Federal program, created by an act of Congress in Program (NFIP) 1968 that makes flood insurance available in communities that enact satisfactory floodplain management regulations.

One Hundred (100)-Year

The flood elevation that has a one-percent chance of occurring in any given year. It is also known as the Base Flood.

Planning

The act or process of making or carrying out plans; the establishment of goals, policies, and procedures for a social or economic unit.

Repetitive Loss Property

A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least $1000 each have been paid within any 10-year period since 1978.

Risk

The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It can also be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Riverine

Relating to, formed by, or resembling rivers (including tributaries), streams, creeks, brooks, etc.

Riverine Flooding

Flooding related to or caused by a river, stream, or tributary overflowing its banks due to excessive rainfall, snowmelt or ice.

Runoff

That portion of precipitation that is not intercepted by vegetation, absorbed by land surface, or evaporated, and thus flows overland into a depression, stream, lake, or ocean (runoff, called immediate subsurface runoff, also takes place in the upper layers of soil).

Seiche

An oscillating wave (also referred to as a seismic sea wave) in a partially or fully enclosed body of water. May be initiated by landslides, undersea landslides, long period seismic waves, wind and water waves, or a tsunami.

Seismicity

Describes the likelihood of an area being subject to earthquakes.

State Disaster Declaration

A disaster emergency shall be declared by executive order or proclamation of the Governor upon finding that a disaster has occurred or that the occurrence or the threat of a disaster is imminent. The state of disaster emergency shall continue until the governor finds that the threat or danger has passed or that the disaster has been dealt with to the extent that emergency conditions no longer exist and terminates the state of disaster emergency by executive order or proclamation.

Along with other provisions, this declaration allows the governor to utilize all available resources of the State as reasonably necessary, direct and compel the evacuation of all or part of the population from any stricken or threatened area if necessary, prescribe routes, modes of transportation and destinations in connection with evacuation and control ingress and egress to and from disaster areas. It is required before a Presidential Disaster Declaration can be requested.

Topography

The contour of the land surface. The technique of graphically representing the exact physical features of a place or region on a map.

Tribal Government

A Federally recognized governing body of an Indian or Alaska native Tribe, band, nation, pueblo, village or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Tsunami

A sea wave produced by submarine earth movement or volcanic eruption with a sudden rise or fall of a section of the earth's crust under or near the ocean. A seismic disturbance or landslide can displace the water column, creating a rise or fall in the level of the ocean above. This rise or fall in sea level is the initial formation of a tsunami wave.

Vulnerability

Describes how exposed or susceptible to damage an asset it. Vulnerability depends on an asset’s construction, contents, and the economic value of its functions. The vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power – if an electrical substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Other, indirect effects can be much more widespread and damaging than direct ones.

Vulnerability Assessment

The extent of injury and damage that may result from hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.

Watercourse

A natural or artificial channel in which a flow of water occurs either continually or intermittently.

Watershed

An area that drains to a single point. In a natural basin, this is the area contributing flow to a given place or stream.

Appendix A: Public Involvement

CITY OF CRAIG
ALASKA

November 21, 2017

Brent Nichols, CFM
State of Alaska
DMVA DHS&EM
P.O. Box 5750
Joint Base Elmendorf-Richardson, Alaska 99505-5750

Mr. Nichols:

This letter serves as the City of Craig's Letter of Commitment to support DMVA DHS&EM and LeMay Engineering & Consulting, Inc. in their Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) planning grant to update the 2009 hazard mitigation plan for the City of Craig. The end goal of this grant is a State- and FEMA- approved hazard mitigation plan that the City of Craig will adopt.

Sincerely,

Timothy O'Connor
Mayor

(907) 826-3275 • Fax (907)826-3278 • www.craigak.com • PO Box 725, Craig, Alaska 99921

City of Craig Hazard Mitigation Plan Committee Introductory Meeting

November 21, 2017

10 AM at City Office

Name	Organization	Contact Information (phone or email)
Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc	Patrick.LeMay@LeMayengineering.com
Jon Bolling	City of Craig	826-3275
David Nelson	City of Craig	826-3405
HANS HJORT	City of Craig Harbor Dept.	401-0995
RJ Ehy	Craig Police Dept	401-0252 / 826-3330
Brian Templin	CITY OF CRAIG. PLANNING DEPT.	826-3275

Hazard Mitigation Plan Update for Craig, Alaska

Newsletter #1: November 2017

The State of Alaska, Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management (DHS&EM) was awarded a Pre-Disaster Mitigation Program grant from the Federal Emergency Management Agency (FEMA) to update the 2009 hazard mitigation plan (HMP) for the City of Craig. This plan will assist the City as a valuable resource tool in making decisions. Additionally, communities must have a State- and FEMA-approved and community-adopted HMP plan to receive FEMA pre- and post- disaster grants.

LeMay Engineering & Consulting, Inc. was contracted to assist Craig with preparing a 2017 HMP update. The HMP will identify all applicable natural hazards. The plan will identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts.

Join the planning team and offer your advice: Any interested community member may join the planning team. To join, call or send Jennifer LeMay an email at jlemay@lemayengineering.com. The purpose of this newsletter is to introduce this project and encourage public involvement during this process. The goal is to receive comments, identify key issues or concerns, and improve mitigation ideas.

Attend the November 21, 2017, City Council Meeting at 7 pm at Council Chambers: The agenda will be a summary of the hazard mitigation plan process by Patrick LeMay. You're invited to provide input to the plan. Specifically, we'll be discussing which of the following hazards are realistic for Craig: earthquake, tsunami, flood/erosion, ground failure/avalanche, severe weather, wildland fire, and climate change? Also, what facilities are critical to your community?

For more information, contact:
Brian Templin, Craig City Planner (907) 826-3275
Patrick LeMay, PE, Planner (907) 250-9038
Jennifer LeMay, PE, PMP, Lead Planner (907) 350-6061
Brent Nichols, DMVA, DHS&EM Project Manager (907) 428-7085

City of Craig Hazard Mitigation Plan Committee Introductory Meeting

November 21, 2017

7 pm City Council Meeting at Council Chambers

Name	Organization	Contact Information (phone or email)
Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc.	patrick.lemay@lemayengineering.com
Brian Templin	CITY OF CRAIG PLANNING DEPT.	planner@craigak.com
Kevin McDonald	City of Craig Planning Commission	907-826-5750
Millie Schoonover	Planning Commission	907-401-8461
Sharilyn Zellhuber	Planning Commission	mszell@hotmail.com
Barbara Stanley	Planning Commission	907 826-2428
John Moots	Planning Commission	907-826-2327

CITY OF CRAIG
PLANNING COMMISSION AGENDA

Meeting of November 21, 2017
7:00 p.m., Craig City Council Chambers

Roll Call
Sharilyn Zellhuber (chair), John Moots, Kevin McDonald, Barbara Stanley, Millie Schoonover

Approval of Minutes
1. Approval of minutes of July 27, 2017
2. Approval of minutes of August 10, 2017

Public Comment
1. Non-Agenda Items

Public Hearing and New Business
1. Craig Multi Hazard Mitigation Plan Kickoff

Old Business
1. Craig Comprehensive Plan Update – Plan Review

Adjourn

CITY OF CRAIG
PLANNING COMMISSION MINUTES
Meeting of July 27, 2017

Roll Call
Present were Sharilyn Zellhuber (chair), John Moots, Kevin McDonald, and Barbara Stanley. Millie Schoonover was absent excused.

Also present were Brian Templin, Barbara Moots, Teresa McCallum and John McCallum.

Approval of Minutes

1. Approval of minutes of June 22, 2017. A motion was made and seconded to approve the minutes of the June 22,2017 meeting.

MOTION TO APPROVE STANLEY/MCDONALD APPROVED

Public Comment

1. Non-Agenda Items. There were no non-agenda items discussed.

Public Hearing and New Business

1. CUP 170727 - John Moots, Accessory structure on a lot without a principal residential use. John Moots recused himself from voting on the issue as the applicant. Brian reported that John Moots had applied to the commission for a conditional use permit to place a garage/storage building on his lot in the PSN 3 subdivision without a principal residence on the property. Brian said that a staff report had been included in the meeting packet. Brian also noted that John and Teresa McCallum and Gregory Byron, a lawyer representing the McCallums had submitted written comments which were included in the packet. John Moots talked about his intended use of the accessory building and his timeline for construction on the property. John said that the accessory building would likely remain on the lot after the house was constructed.

   Kevin noted that part of the lot was outside of city limits.

   The McCallums noted that they had not received a notice of the CUP hearing but had heard about it from a neighbor. Brian said that a notice had been sent to their home address as required by code but since their home was in Idaho they had likely not seen the notice.

   John McCallum commented that he did not understand why the city would allow a storage shed on a property in an area with high value homes and low density zoning. He asked for an additional 30 days for them to look at the request before the commission ruled on it.

Teresa McCallum noted that Shaan-Seet had some restrictive covenants on the property but did not have a copy of the covenants. Brian noted that he had not ever seen any covenants on the properties. He noted that he had also contacted Shaan-Seet and they could not find any restrictive covenants on the properties.

Teresa also expressed some concern that some of the previous excavation appeared to be over the property line. John commented that he had located corners and felt that everything was within the proper boundaries. John offered to meet with the McCallums on the property to look at their concern about the property line.

There was some discussion of property values. Several commissioners commented that they had not ever seen any impact to property values based on a development similar to what was proposed.

Teresa asked if an as-built would be prepared or if the property line would be surveyed as a result of the conditional use permit. Brian said that neither item was generally required in Craig but the commission could attach conditions if it felt they were necessary.

There was some discussion about the time frame if the decision were postponed. Brian said that the municipal code required 10 days notice for conditional use permits so the 30 days that was requested was likely excessive. He said that the commission could choose to postpone the issue for anytime since the mandatory 10 days had already been met. John said that he didn't need an immediate decision but did not want the decision to be postponed more than a couple of weeks to allow him to start construction during the summer months if possible.

A motion was made to postpone CUP 170727 and to schedule a special meeting on August 10th to hear the issue.

MOTION TO POSTPONE	STANLEY/MCDONALD	APPROVED

Old Business

1. Off Street Parking – No Action was taken on this item.

Adjourn

A motion was made and seconded to adjourn the meeting.

MOTION TO ADJOURN	MCDONALD/STANLEY	APPROVED

Chairman Sharilyn Zellhuber ATTEST: Brian Templin

CITY OF CRAIG
PLANNING COMMISSION MINUTES
SPECIAL MEETING
Meeting of August 10, 2017

Roll Call
Sharilyn Zellhuber (chair), John Moots, Kevin McDonald, and Barbara Stanley were present. Millie Schoonover was absent excused.

Approval of Minutes
No minutes were presented for approval.

Public Comment
1. Non-Agenda Items. There were no comments on non-agenda items.

Public Hearing and New Business
There were no new business items.

Old Business
1. CUP 170727 - John Moots, Accessory structure on a lot without a principal residential use. Brian reported to the commission that this was a followup to the discussion at the July 27, 2017 meeting. John Moots recused himself as the applicant.

   Brian noted that he had received an email from John and Teresa McCallum, who had objected to the permit at the July 27th meeting. The email stated that the McCallums were removing their objections. A copy of the email was given to the commission in the meeting packet.

   John Moots commented that he had met with the McCallums and determined that all improvements and excavation were on the correct side of the property line. The Moots and McCallums also discussed the project on site.

   A motion was made and seconded to approve CUP 170727.

MOTION TO APPROVE	STANLEY/MCDONALD	APPROVED

Adjourn
A motion was made and seconded to adjourn the meeting.

MOTION TO ADJOURN	STANLEY/MCDONALD	APPROVED

Chairman Sharilyn Zellhuber

ATTEST: Brian Templin

CITY OF CRAIG
MEMORANDUM

To: Planning Commission
From: Brian Templin, City Planner
Date: November 17, 2017
RE: Craig Comprehensive Plan Update – Plan Review

As the commission is aware we have been working on updating the city's comprehensive plan since last fall. It was my intent to complete the process by this spring but the mapping took longer than anticipated and I didn't spend as much time on it as I wanted due to other projects over the summer.

I recently completed the mapping and the final edits to the background section. All sections of the Issues, Goals and Strategies have already been reviewed by both the planning commission and city council.

I have assembled a complete draft comprehensive plan update for planning commission review and comment. The draft contains several sections and annexes.

I have also included the transportation plan and community economic development strategy annexes even though these plans are outdated. I wanted to include them as placeholders. The updated comprehensive plan calls for an update to these plans and I will work on an updated transportation plan and CEDS process in 2018. When the new plans are approved they will be placed into the annex section of the comprehensive plan in place of the current ones.

I emailed copies of the plan and made print copies available here at city hall for planning commissioners. Please be prepared to discuss all sections of the plan and recommend any corrections/changes prior to submitting the plan to the city council for adoption.

Recommendation: Recommend changes/corrections to the draft comprehensive plan update and forward to the Craig City Council for consideration and adoption.

CITY OF CRAIG
MEMORANDUM

To: Craig Planning Commission
From: Brian Templin, City Planner
Date: November 17, 2017
RE: Craig Multi-Hazard Mitigation Plan

In 2009 the State of Alaska contracted with Bechtol Planning to write a hazard mitigation plan for Craig. This plan is intended to identify potential hazards and projects to mitigate damage to property and loss of life. The planning commission conducted the kickoff meeting and the public hearing for the plan in 2009.

FEMA requires that these plans are updated every five years. This year the state has contracted with Lemay Engineering to write the plan update. I have been working with department heads in preparation. I have a meeting scheduled with department heads and the contractor at 10 am on November 21st ahead of the planning commission meeting that night.

At the meeting on November 21st Jennifer Lemay will lay out the process to the planning commission and take any public comments on the issue. It is her intent to draft the update to the plan based on input from staff, the planning commission, the public, and myself. Jennifer intends to bring a draft plan back to the planning commission for a public hearing and to kickoff the public review period in January 2018.

I sent out a copy of the current plan by email to the commission last week. If you need another copy or would like a printed copy please let me know.

I do not expect any formal action by the commission on this issue at the November 21st meeting.

Hazard Mitigation Planning Process

Updates to existing plans

Plans must be updated every five years and approved by DHS&EM and FEMA and then adopted by the community by resolution for the community to remain eligible for FEMA grant funding

This is a public process. Everyone who wants to be involved will be given the opportunity to be involved in this process. Send Jennifer LeMay, PE, PMP an email if you'd like more information at jlemay@lemayengineering.com or call her at (907) 350-6061.

We welcome public input and will have a public comment hearing at a public meeting for you to provide input on the plan.

Which hazards are applicable for your community?

- Flood
- Erosion
- Wildland Fire
- Tsunami/Seiche
- Earthquake
- Volcano
- Avalanche
- Ground Failure/Landslide
- Permafrost Degradation
- Severe Weather
- Climate Change

We're interested in information related to:

- hazard identification,
- profiles,
- previous occurrences,
- probability of occurrences, and
- typical recurrence intervals

for each potential hazard.

Plan Process

- Today's introductory meeting
- Gathering of data
- Draft Plan available for public comment (December is our goal month)
- Public hearing for Draft Plan (public comment period)
- State/FEMA review and pre-approval
- Newsletter announcing Final Plan (the public may still comment)
- City and/or Tribal adoption
- Final Approval from State/FEMA (prior to April 23, 2018).

After Plan is completed, approved, and adopted, your community will be eligible to apply for mitigation project funds from DHS&EM and FEMA for five years until the plan requires another update.

Contacts:

Patrick LeMay, PE, LeMay Engineering & Consulting, Inc. Planner (907) 250-9038
Jennifer LeMay, PE, PMP LeMay Engineering & Consulting, Inc. Planner (907) 350-6061
Brent Nichols, CFM, State of Alaska DHS&EM Hazard Mitigation Officer (907) 428-7085

Patrick M. LeMay, P.E.
President
4272 Chelsea Way
Anchorage, AK 99504
(907) 250-9038
patrick.lemay@lemayengineering.com

November 22, 2017

Brent A. Nichols, EMSII, CFM
Emergency Management Specialist (EMS) II & Certified Floodplain Manager (CFM)
Department of Military and Veterans Affairs (DMVA)
Division of Homeland Security and Emergency Management (DHS&EM)
P.O. Box 5750
JBER, AK 99505-5750

Subject: **Hazard Mitigation Planning Process Trip Report**
City of Craig, Alaska

On November 21, 2017, Patrick M. LeMay, PE of LeMay Engineering & Consulting, Inc. traveled to Craig, Alaska. The purpose of this trip was to conduct an introductory meeting, gather hazard data, review with community leaders the applicable hazards for the area, review potential mitigation strategies, and update the critical facilities within the community.

Craig City Planner Brian Templin provided a commitment letter signed by Mayor Timothy O'Connor verifying that the City of Craig will evaluate the 2017 draft hazard mitigation plan and present it to the City Council for adoption through the Craig Planning Commission. A public review meeting is scheduled in Craig for Wednesday night, February 7, 2017 for public comment on the Draft Hazard Mitigation Plan as part of the Planning Commission meeting. The Planning Commission will make the Draft Plan available for review 30 days prior to the public meeting. The Draft Plan will be posted on the City Web-site, and copies will be available in the Library, City Hall, Police Department, Fire Department, Planning Department, and Public Works Department.

Two meetings occurred during the site visit. A City of Craig Hazard Mitigation Plan Committee Introductory Meeting with city employees, from 10 AM to 1:30 PM and included:

Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc.
Jon Bolling	Craig City Administrator
David Nelson	Public Works Department
RJ Ely	Chief of Police
Hans Hjort	City of Craig, Harbormaster
Brain Templin	City of Craig Planning Department

A City of Craig Mitigation Plan Committee Introductory Meeting with the Planning & Zoning Commission (Public) from 7 PM to 8:30 PM and included:

Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc.
Jon Bolling	Craig City Administrator

Brain Templin	City of Craig Planning Department
Kevin McDonald	Planning and Zoning Commission
Millie Schooms	Planning and Zoning Commission
Sharilyn Zellhuber, Chairman	Planning and Zoning Commission
Barbara Standley	Planning and Zoning Commission
John Moots	Planning and Zoning Commission

Both meetings resulted in valuable information to update the City of Craig Hazard Mitigation Plan to include local climate change issues and five new mitigation action strategies.

If you have any questions, please do not hesitate to call me at (907) 250-9038.

11/22/17

Patrick M. LeMay, P.E./Date
LeMay Engineering & Consulting, Inc.

Appendix B: Area Use Map


AREA USE MAP
CRAIG
55° 28' 40" N 133° 08' 50" W (NAD 83)
Approximate Elevation: 22'
Township 74 South, Range 81 East, C.R.M., AK
U.S.G.S. Quadrangle "Craig B-4 and C-4", Alaska
KETCHIKAN RECORDING DISTRICT
SEE SHEETS 1 THROUGH 4 FOR DETAILED COMMUNITY MAPS
0 400 800 1200
SCALE IN FEET
SCALE: 1"=400'
Date of Photography: May 22, 2004.
Magnetic Declination computed by U.S.G.S. Geomag Program using AK-2000.COF model as of July 1, 2004.
SHEET 5 of 5
True North
Magnetic North 20° 0'E
CRAIG CITY BOUNDARY
BUCARELI BAY
KLAWOCK INLET
PORT BAGIAL
CRAB BAY
PORT ST. NICHOLAS
CAPE SUSPIRO
CRAB CREEK
FISH EGG ISLAND
SEC. 6
SEC. 31
CRAIG TIDELANDS ADDITION
ATS 212
U.S. Survey 1429-A
BLOCK 16, USS 1430
TRIANGLE PARK
U.S. Survey No. 1430
CRAIG TOWNSITE
PORTIONS OF TR B, LOT 8A, USS 1430
LOT 4A, BL. 20 USS 1430
SEAPLANE SUBDIVISION
LOTS 1-3, BL. 28
NORTH COVE BOAT LAUNCH
TRACTS L-1 & L-2, USS 2327
EMERGENCY HELIPAD
TR H
TR G
ATS 1410
Plat No. 92-20
TR E
TR F
TR D
TR B
TR A
SEC. 7
SEC. 8
SEC. 17
SEC. 16
SEC. 9
SEC. 4
SEC. 5
SEC. 32
SEC. 33
GRAVEYARD ISLAND TRAIL
CEMETERY ISLAND
CRAIG CEMETERY TRACT
GRAVEYARD ISLAND TRAILHEAD
ANCSA 14(c)
Plat No. 95-57
TR I
TR J
TR K
TR L
TR M
WINDANSEA SUBDIVISION
STREET OF DREAMS SUBD.
CRAIG MUNI SUBD.
DOUVILLE SUBD.
PARK PLACE SUBD.
SUBD. OF LOT 11A-1
UNSUBDIVIDED REMAINDER OF TRACT Q
UNSUBDIVIDED REMAINDER OF LOT 2, SEC. 5
INDUSTRIAL PARK TIDELANDS SUBD. FALSE ISLAND
INDUSTRIAL PARKS TIDELANDS SUBD. TRACTS I-1,J-2, J-1,J-2; ATS 1410
SHAAN-SEET INDUSTRIAL TRACTS SUBD. PHASE 1 LOTS 1-9
LOTS 1-4, FALSE ISLAND SUBDIVISION
LOTS 2A, 3A & 4A, JT. BROWN SUBD.
LOTS 1-9, JT. BROWN SUBDIVISION
TRACT B, BL 1A ANCSA 14(c), SHAAN-SEET, INC.
CRAB COVE HEIGHTS SUBD.
LOTS 10-12, BL. 2 & LOTS 1-3, BL. 4
SUBDIVISION OF ANCSA 14(c) TRACTS D1 & D2 CRAB COVE SUBD.
RES. LAND BANK ANCSA 14(c) SURVEY
SALMONBERRY SUBDIVISION
EAST HAMILTON PARK
SANDY BEACH RECREATION AREA
SANDY BEACH RECREATION PARKING
CRAIG POLICE DEPT. SHOOTING RANGE
MUNICIPAL WATER STORAGE TANKS
APPROXIMATE LOCATION 1/2 Acre Site Easement EN 14-1
APPROXIMATE LOCATION 20' Existing Water Pipeline Easement EN 17-1
SUNNAHAE MOUNTAIN TRAILHEAD
SUNNAHAE MOUNTAIN TRAIL
RIGHT OF WAY/ DEPARTMENT OF TRANSPORTATION
LANDFILL/ TRANSFER STATION
EEL GRASS AREA
50' Public Access Easement
100' Trail Easement
R 81 E
T 74 S
T 73 S
R 82 E
CRAIG_AREA_USE_MAP SHEET 5 1"=400' (2004 PHOTOGRAPHY)

Appendix C: FEMA Review Tool

Appendix D: Benefit-Cost Analysis Fact Sheet

Benefit-Cost Analysis Fact Sheet

Hazard mitigation projects are specifically aimed at reducing or eliminating future damages. Although hazard mitigation projects may sometimes be implemented in conjunction with the repair of damages from a declared disaster, the focus of hazard mitigation projects is on strengthening, elevating, relocating, or otherwise improving buildings, infrastructure, or other facilities to enhance their ability to withstand the damaging impacts of future disasters. In some cases, hazard mitigation projects may also include training or public-education programs if such programs can be demonstrated to reduce future expected damages.

A Benefit-Cost Analysis (BCA) provides an estimate of the "benefits" and "costs" of a proposed hazard mitigation project. The benefits considered are avoided future damages and losses that are expected to accrue as a result of the mitigation project. In other words, benefits are the reduction in expected future damages and losses (i.e., the difference in expected future damages before and after the mitigation project). The costs considered are those necessary to implement the specific mitigation project under evaluation. Costs are generally well determined for specific projects for which engineering design studies have been completed. Benefits, however, must be estimated probabilistically because they depend on the improved performance of the building or facility in future hazard events, the timing and severity of which must be estimated probabilistically.

All Benefit-Costs must be:

- Credible and well documented
- Prepared in accordance with accepted BCA practices
- Cost-effective (BCR $\geq$ 1.0)

General Data Requirements:

- All data entries (other than Federal Emergency Management Agency [FEMA] standard or default values) MUST be documented in the application.
- Data MUST be from a credible source.
- Provide complete copies of reports and engineering analyses.
- Detailed cost estimate.
- Identify the hazard (flood, wind, seismic, etc.).
- Discuss how the proposed measure will mitigate against future damages.
- Document the Project Useful Life.
- Document the proposed Level of Protection.
- The Very Limited Data (VLD) BCA module cannot be used to support cost-effectiveness (screening purposes only).
- Alternative BCA software MUST be approved in writing by FEMA HQ and the Region prior to submittal of the application.

Damage and Benefit Data

- Well documented for each damage event.
- Include estimated frequency and method of determination per damage event.
- Data used in place of FEMA standard or default values MUST be documented and justified.

- The Level of Protection MUST be documented and readily apparent.
- When using the Limited Data (LD) BCA module, users cannot extrapolate data for higher frequency events for unknown lower frequency events.

Building Data

- Should include FEMA Elevation Certificates for elevation projects or projects using First Floor Elevations (FFEs).
- Include data for building type (tax records or photos).
- Contents claims that exceed 30 percent of building replacement value (BRV) MUST be fully documented.
- Method for determining BRVs MUST be documented. BRVs based on tax records MUST include the multiplier from the County Tax Assessor.
- Identify the amount of damage that will result in demolition of the structure (FEMA standard is 50 percent of pre-damage structure value).
- Include the site location (i.e., miles inland) for the Hurricane module.

Use Correct Occupancy Data

- Design occupancy for Hurricane shelter portion of Tornado module.
- Average occupancy per hour for the Tornado shelter portion of the Tornado module.
- Average occupancy for Seismic modules.

Questions to Be Answered

- Has the level of risk been identified?
- Are all hazards identified?
- Is the BCA fully documented and accompanied by technical support data?
- Will residual risk occur after the mitigation project is implemented?

Common Shortcomings

- Incomplete documentation.
- Inconsistencies among data in the application, BCA module runs, and the technical support data.
- Lack of technical support data.
- Lack of a detailed cost estimate.
- Use of discount rate other than FEMA-required amount of 7 percent.
- Overriding FEMA default values without providing documentation and justification.
- Lack of information on building type, size, number of stories, and value.
- Lack of documentation and credibility for FFEs.
- Use of incorrect Project Useful Life (not every mitigation measure = 100 years).

Appendix E: Plan Maintenance Documents

Annual Review Questionnaire

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
PLANNING PROCESS	Are there internal or external organizations and agencies that have been invaluable to the planning process or to mitigation action			
	Are there procedures (e.g., meeting announcements, plan updates) that can be done more efficiently?			
	Has the Task Force undertaken any public outreach activities regarding the MHMP or implementation of mitigation actions?			
HAZARD PROFILES	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not been addressed in this HMP and should be?			
	Are additional maps or new hazard studies available? If so, what have they revealed?			
VULNERABILITY ANALYSIS	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
MITIGATION STRATEGY	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning within the			
	Are the goals still applicable?			
	Should new mitigation actions be added to the a community's Mitigation Action Plan?			
	Do existing mitigation actions listed in a community's Mitigation Action Plan need to be reprioritized?			
	Are the mitigation actions listed in a community's Mitigation Action Plan appropriate for available resources?			

Mitigation Action Progress Report

Progress Report Period: _____ (date) to _____ (date)

Project Title: _____ Project ID# _____

Responsible Agency: _____

Address: _____

City: _____

Contact Person: _____ Title: _____

Phone #(s): _____ email address: _____

List Supporting Agencies and Contacts:

_____

_____

Total Project Cost: _____

Anticipated Cost Overrun/Underrun: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase): _____

_____

_____

_____

Milestones	Complete	Projected Date of Completion

Plan Goal (s) Addressed:

Goal: _____

Indicator of Success: _____

_____

_____

_____

Project Status

☐ Project on schedule

☐ Project completed

☐ Project delayed*

*explain: _____

_____

☐ Project canceled

Project Cost Status

☐ Cost unchanged

☐ Cost overrun*

*explain: _____

_____

☐ Cost underrun*

*explain: _____

_____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

_____

_____

_____

_____

B. What obstacles, problems, or delays did you encounter, if any?

_____

_____

_____

_____

C. How was each problem resolved?

_____

_____

_____

_____

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

Other Comments:

Community Local Hazard Mitigation Plan Survey

This survey is an opportunity for you to share your opinions and participate in the mitigation planning process. The information that you provide will help us better understand your concerns for hazards and risks, which could lead to mitigation activities that will help reduce those risks and the impacts of future hazard events.

The hazard mitigation process is not complete without your feedback. All individual responses are strictly confidential and will be used for mitigation planning purposes only.

Please help us by taking a few minutes to complete this survey and return it to:

Planner, City of Craig

PO Box 725
Craig, AK 99921

Vulnerability Assessment

The following questions focus on how vulnerable the community or its facilities are to damage from a particular hazard type using the following vulnerability scale:

0= Don't Know 1 =Minimally Vulnerable 2=Moderately Vulnerable 3=Severely Vulnerable

1. How vulnerable to damage are the *structures* in the community from:

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Volcanoes?	0 1 2 3
e. Snow Avalanche?	0 1 2 3
f. Tsunami/Seiches?	0 1 2 3
g. Severe weather storms?	0 1 2 3
h. Ground failure (landslide, permafrost)?	0 1 2 3
i. Coastal erosion?	0 1 2 3
j. Climate change?	0 1 2 3
k. Other hazards?	0 1 2 3
Please Specify:	

2. How vulnerable to damage are the *critical facilities* within our community from:

[Critical facilities include airport, community shelter, bulk fuel storage tanks, generators, health clinic, law enforcement office (VPO, VPSO, police department), school, public works, e.g. washeteria/water treatment, reservoir/water supply, satellite dish, communications tower, landfills, sewage lagoons, and stores.]

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Volcanoes?	0 1 2 3
e. Snow Avalanche?	0 1 2 3
f. Tsunami/Seiches?	0 1 2 3
g. Severe weather storms?	0 1 2 3
h. Ground failure (landslide, permafrost)?	0 1 2 3
i. Coastal erosion?	0 1 2 3
j. Climate change?	0 1 2 3
k. Other hazards?	0 1 2 3

Please Specify:

3. How vulnerable to displacement, evacuation or life-safety is the community from:

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Volcanoes?	0 1 2 3
e. Snow Avalanche?	0 1 2 3
f. Tsunami/Seiches?	0 1 2 3
g. Severe weather storms?	0 1 2 3
h. Ground failure (landslide, permafrost)?	0 1 2 3
i. Coastal erosion?	0 1 2 3
j. Climate change?	0 1 2 3
k. Other hazards?	0 1 2 3

Please Specify:

4. Do you have a record of damages incurred during past flood events? Yes No

If yes, please describe:_____

_____

_____

Preparedness

Craig Hazard Analysis

Preparedness activities are often the first line of defense for protection of your family and the community. In the following list, please check those activities that you have done, plan to do in the near future, have not done, or are unable to do. *Please check one answer for each preparedness activity*.

Have you or someone in your household:	Have Done	Plan to do	Not Done	Unable to do
Attended meetings or received written information on natural disasters or emergency preparedness?	☐	☐	☐	☐
Talked with family members about what to do in case of a disaster or emergency?	☐	☐	☐	☐
Made a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	☐	☐	☐	☐
Prepared a "Disaster Supply Kit" extra food, water, medications, batteries, first aid items, and other emergency supplies)?	☐	☐	☐	☐
In the last year, has anyone in your household been trained in First Aid or CPR?	☐	☐	☐	☐

5. Would you be willing to make your home more resistant to natural disasters? ☐ Yes ☐ No

6. Would you be willing to spend more money on your home to make it more disaster resistant? ☐ Yes ☐ No ☐ Don't know

7. How much are you willing to spend to better protect your home from natural disasters? *(Check only one)*

☐	Less than $100	☐	Desire to relocate for protection
☐	$100-$499	☐	Other, please explain
☐	$500 and above		
☐	Nothing / Don't know		
☐	Whatever it takes		

Mitigation Activities

A component of the Local Hazard Mitigation Plan activities is developing and documenting additional mitigation strategies that will aid the community in protecting life and property from the impacts of future natural disasters.

Mitigation activities are those types of actions you can take to protect your home and property from natural hazard events such as floods, severe weather, and wildfire. Please check the box

for the following statements to best describe their importance to you. Your responses will help us determine your community's priorities for planning for these mitigation activities.

Statement	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	☐	☐	☐	☐	☐
Protecting critical facilities (clinic, school, washeteria, police/fire department, water/sewer, landfill)	☐	☐	☐	☐	☐
Preventing development in hazard areas	☐	☐	☐	☐	☐
Protecting natural environment	☐	☐	☐	☐	☐
Protecting historical and cultural landmarks	☐	☐	☐	☐	☐
Promoting cooperation within the community	☐	☐	☐	☐	☐
Protecting and reducing damage to utilities, roads, or water tank	☐	☐	☐	☐	☐
Strengthening emergency services (clinic workers, police/fire)	☐	☐	☐	☐	☐

8. Do you have other suggestions for possible mitigation actions/strategies?

_____

_____

_____

_____

_____

General Household Information

9. Please indicate your age: _____

and Gender: ☐ Male ☐ Female

10. Please indicate your level of education:

☐	Grade school/no schooling	☐	College degree
☐	Some high school	☐	Postgraduate degree

☐	High school graduate/GED	☐	Other, please specify
☐	Some college/trade school		

11. How long have you lived in Nenana?

☐ Less than 5 years ☐ 5 to 10 years ☐ 11 to 20 years ☐ 21 or more years

12. Do you have internet access? ☐ Yes ☐ No

13. Do you own or rent your home? ☐ Own ☐ Rent

If you have any questions regarding this survey or would like to learn about other ways that you can participate in the development of the Local Hazard Mitigation Plan, please contact the City Planner.

Thank You for Your Participation!

This survey may be submitted anonymously; however, if you provide us with your name and contact information below we will have the ability to follow up with you to learn more about your ideas or concerns (optional):

Name: _____

Address: _____

_____

Phone: _____